Lake Meredith National Recreation Area
Texas

National Park Service
U.S. Department of the Interior

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FINAL OFF-ROAD VEHICLE MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT

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EXECUTIVE SUMMARY

This Lake Meredith National Recreation Area Off-road Management Plan / Environmental Impact Statement (plan/EIS) analyzes a range of alternatives and actions for the management of off-road vehicle (ORV) use at Lake Meredith National Recreation Area (the national recreation area). The plan/EIS assesses the impacts that could result from continuing current management (the no-action alternative) or implementation of any of the three action alternatives.

Upon conclusion of this plan and decision-making process, the alternative selected for implementation will become the ORV management plan, which will guide the management and control of ORVs at the national recreation area for the next 15 to 20 years. The plan will also form the basis for a special regulation to manage ORV use at the national recreation area.

BACKGROUND

Lake Meredith was originally created by the construction of the Sanford Dam on the Canadian River in 1965, referred to as the Canadian River Project. The Sanford Dam was designed and built by the Bureau of Reclamation (BOR) to allow impoundment and diversion of water for municipalities in the Texas panhandle, including Amarillo, Borger, Brownfield, Lamesa, Levelland, Lubbock, O'Donnell, Pampa, Plainview, Slaton, and Tahoka. The National Park Service (NPS) became involved with the recreational use of the area in 1961 through a memorandum of understanding and agreement with the BOR (Contract No. 14-06-500-579). This agreement authorized the NPS to investigate, plan, and develop recreational resources for the Canadian River Project. In March 1964, another memorandum of agreement between the NPS and the BOR established that the public recreational use for the Canadian River Project area would be the responsibility of the NPS. By 1968, the BOR turned over the operation and maintenance of the Sanford Dam and associated facilities to the Canadian River Municipal Water Authority (CRMWA), resulting in a cooperative effort between the NPS and the CRMWA for the management of the reservoir and its facilities. This reservoir was referred to as the Sanford Recreation Area until 1974, when it was renamed to Lake Meredith Recreation Area in honor of A. A. Meredith, a civic leader and early promoter of the lake.

On November 28, 1990, Public Law 101-628, 16 U.S. Code (USC) 460eee, established the area as NPS land, stating, "In order to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters, there is hereby established the Lake Meredith National Recreation Area." The national recreation area, containing over 44,977 acres, preserves one of the largest manmade lakes in the Texas panhandle, many archeological sites, and flora and fauna of the area, making it a valuable part of American heritage. From 1971 through 2008, over 55 million people visited the national recreation area, which is an average of almost 1.5 million visitors annually.

PURPOSE OF THE PLAN

The purpose of this plan/EIS is to manage ORV use in the national recreation area for visitor enjoyment and recreation opportunities, while minimizing and correcting damage to resources.

NEED FOR ACTION

The Lake Meredith National Recreation Area provides a variety of visitor experiences, including the use of ORVs. In the 1970s, a special regulation in Title 36 of the Code of Federal Regulations (CFR),

Section 7.57, designated two authorized ORV use areas in the national recreation area: Blue Creek at the north end and Rosita (also known as Rosita Flats) at the south end. ORV use at the national recreation area has changed drastically since the establishment of the special regulation and the first use of ORVs, both in intensity and in the types of ORVs used. Modern all-terrain vehicles (ATVs) are the primary ORVs used today; however, they were not in use when the original regulations took effect. The intensity of ORV use at the national recreation area affects natural and cultural resources and results in visitor use conflicts.

As a result of these considerations, an ORV management plan for Lake Meredith National Recreation Area is needed at this time to

- Comply with Executive Order 11644, Use of Off-road Vehicles on Public Lands, as stated in *Friends of the Earth v. Department of Interior*
- Provide for sustainable recreational ORV use areas
- Address the lack of an approved plan, which has led to ORV use outside of authorized areas
- Address resource impacts resulting from ORV use
- Address the change in numbers, power, range, and capabilities of ORVs.

OBJECTIVES IN TAKING ACTION

Objectives are "what must be achieved to a large degree for the action to be considered a success." All alternatives selected for detailed analysis must meet project objectives to a large degree and resolve the purpose of and need for action. Objectives must be grounded in the national recreation area's enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided by the national recreation area's general management plan (GMP), strategic plan, and/or other management guidance. National recreation area staff identified the following objectives for developing this plan/EIS.

VISITOR USE AND SAFETY

- Manage ORV use to minimize conflicts among different ORV users.
- Promote safe operation of ORVs and safety of all visitors.

MANAGEMENT

- Build stewardship through public awareness and understanding of NPS resource management and visitor use policy and responsibilities as they pertain to the national recreation area and ORV management.

NATURAL RESOURCES

- Minimize adverse impacts on threatened, endangered, and other protected species and their habitats.
- Define effective strategies for soil erosion control and restoration of plant resources to support wildlife populations.

NATIONAL RECREATION AREA OPERATIONS

- Identify ORV plan implementation needs and costs.
- Minimize national recreation area operations and cost impacts as the result of implementing an ORV plan.

PURPOSE AND SIGNIFICANCE OF LAKE MEREDITH NATIONAL RECREATION AREA

All units of the national park system were established for a specific purpose and to preserve significant resources or values for the enjoyment of future generations. The purpose and significance identify uses and values that individual NPS plans should support. The following provides background on the purpose and significance of Lake Meredith National Recreation Area.

As stated in the national recreation area's enabling legislation, Congress established Lake Meredith National Recreation Area in 1990 "to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters" (16 USC 460eee) (Public Law 101-628).

A park significance statement captures the essence of the park's importance to the nation's natural and cultural heritage. Understanding park significance helps managers make decisions that preserve the resources and values necessary to each park's purpose. The following significance statements recognize the important features of the national recreation area. As stated in the *Lake Meredith National Recreation Area General Management Plan*, the national recreation area has the following significance:

> Lake Meredith National Recreational Area is the largest area of public lands in the Texas panhandle, providing opportunities for access to diverse, affordable outdoor land- and water-based recreation activities.
>
> Lake Meredith and Canadian River basin in the recreation area provide aquatic, wetland, and riparian habitats, and one of the few areas in the region with trees. These habitats and the ecological transition zones between them and the surrounding landscape support diverse plant and animal species, including migratory waterfowl.
>
> The natural and geologic resources of the recreation area have enabled human survival, subsistence, and adaptation that have resulted in a continuum of human presence in the Texas panhandle for more than 13,000 years. Cultural sites in Lake Meredith National Recreation Area and the adjacent Alibates Flint Quarries National Monument offer views of lifeways in every cultural period that have been identified.
>
> The exposed geologic features of the Canadian River breaks in the recreation area reveal active geological processes that are easily visible to an extent not present elsewhere in the region. The topography and geography of the Canadian River breaks create a divergence from the surrounding landscape that offers scenic values and opportunities not found elsewhere in the region.

ISSUES AND IMPACT TOPICS

The national recreation area staff identified issues associated with implementing an ORV management plan at Lake Meredith National Recreation Area during the internal scoping meeting and the public identified issues during the public scoping process, including the three public meetings. Table ES-1 details the issues that were discussed and analyzed in the plan/EIS.

TABLE ES-1: ISSUES AND IMPACT TOPICS

Issue	Reason for Analysis
Soils	Impacts on soils from ORV use have occurred and continue to occur in the designated area of Rosita, particularly between the entrance and Bull Taco Hill. Extensive soil erosion has occurred over the last 40 years, primarily due to the use of ORVs above the 3,000-foot elevation line. On hillsides with slopes of 15 degrees or more, soils often erode during and after rainfall events because of the steep slopes and the removal of vegetation by ORV use. In addition, this event generally continues through rainstorms, and the potential for damage to geologic resources increases considerably. The soils at the Blue Creek ORV use area remain in better condition than at Rosita Flats due to greater ranger presence and the rangers' ability to control ORV use and the associated impacts on hillsides and slopes. However, the potential for ORV use to impact geologic resources in the Blue Creek area remains, especially if such use increases or occurs outside designated routes or areas.
Vegetation	Use of ORVs in the Blue Creek and Rosita Flats areas has caused severe damage to plant communities, as documented in several planning documents and resource studies at Lake Meredith. At the Blue Creek ORV use area, ORV tracks parallel and cross Big Blue Creek several times, cutting through adjacent vegetation. Damage in the Rosita Flats area is extensive, both in geographic area and in the types of effects on the natural communities. Riparian area trees, including cottonwoods and tall grasses, have also been impacted by having their roots exposed by ORV traffic. Invasive species are a potential threat to the native vegetation communities of the national recreation area. Thirty-seven nonnative species have been documented in the national recreation area, 10 of which have been classified as "highly invasive" and are displacing native species and 8 of which are classified as "invasive and potentially problematic." Because ORVs have been found to spread the seeds of invasive species, this issue is addressed in the plan/EIS.
Water Resources	Lake Meredith National Recreation Area contains important water resources, including the surface of the lake and tributaries and groundwater in various aquifers beneath the national recreation area. The primary drainage in and out of the lake is the Canadian River, much of which flows underground. For drinking water supply, Lake Meredith water is blended with wellfield water from the Ogallala aquifer. The Blue Creek and Rosita Flats ORV use areas contain water features including rivers and streams. Current management allows the operation of vehicles within and adjacent to portions of Big Blue Creek, the Canadian River, and Bonita Creek. ORV use in riparian areas could impact water quality because of increased soil erosion, vehicle fluid leakage, and discarded trash, which could result in pollutants entering surface or groundwater resources.
Soundscapes and the Acoustic Environment	Impacts related to soundscapes could occur where ORVs are allowed in Rosita Flats or Blue Creek. A wide variety of ORV use occurs at the national recreation area (trucks, ORVs, utility terrain vehicles (UTVs), dune buggies, rock climbers, etc.), each emitting various levels of noise. Vehicular noise has the potential to impact other users in these areas, such as those camping, enjoying picnics with their families, or participating in other activities. ORV noise could also discourage wildlife from using these areas.

Issue	Reason for Analysis
Wildlife and Wildlife Habitat	Lake Meredith National Recreation Area provides important habitat for wildlife in the region, especially water-dependent species. Reservoirs, playa lakes, and the river systems are used as important stopover points for birds during migration. Common mammals known to live in and around the national recreation area include mule deer, white-tailed deer, coyotes, porcupines, raccoons, skunks, ground squirrels, rabbits, pocket gophers, moles, a few bat species, and several varieties of rats and mice. Pronghorn antelope may occasionally stray into the area, but are primarily found in the flatter topography in upland prairies away from the Canadian River. Prominent birdlife consists of wild turkeys, northern bobwhites, scaled quail, mourning doves, greater roadrunners, and red-winged blackbirds. The national recreation area lies along the Central Flyway, which is a major north–south bird migration route located between the arid region to the west and the moister landscapes to the east. Large numbers of ducks, geese, and other migratory birds come to use open water areas as well as wetland areas during the fall through spring months. Turtles, lizards, frogs, and snakes, including two poisonous species (prairie rattlesnake and western diamondback rattlesnake), can be found in the national recreation area. Extensive ORV use at the national recreation area has resulted in the loss of a considerable amount of ground vegetation, which is important to support native wildlife such as birds, deer, and mice. ORV use also has the potential to cause impacts on wildlife as a result of vehicle noise, which contributes to species disturbance or displacement, and habitat damage caused by vehicle use outside of permitted areas and within the riverbed in the Rosita ORV use area.
Threatened and Endangered Species/Species of Concern	Habitat for federally threatened and endangered species, such as the Arkansas River shiner (*Notropis girardi*), may be vulnerable to disturbances caused by recreational uses, including ORV use. Current and possible future management alternatives for ORV and other recreational uses would take into consideration the needs of federally listed threatened and endangered species, as well as species of concern, in determining management measures.
Archeological Resources	Due to its use as a major trade route, the Canadian River and its tributaries were a major focal point for prehistoric and historic activities, as demonstrated by a high density of sites located on the uplands, side drainages, and tributary drainages of the river. Archeological surveys conducted in the Rosita Flats area as part of a plan for prescribed burns in 2005 identified six archeological sites. ORV use has the potential to expose and disturb archeological sites through the erosion that can result from tire ruts and other ORV use. Because of known archeological sites in the Rosita Flats area and the potential for unknown sites in this area and in Blue Creek, impacts on archeological resources are analyzed in this plan/EIS.
Visitor Use and Experience / Health and Safety	ORV use has taken place at Rosita and Blue Creek since at least the 1950s and today this area is still popular with ORV enthusiasts. Because ORV use at the national recreation area is an integral component of the experience for some visitors, visitors may be affected by potential ORV management actions, especially if certain restrictions or user fees are involved. Visitors who do not use ORVs may also be impacted by ORV use, either through visitor conflicts or aesthetic/visitor experience issues. While there are no documented conflicts between ORV users, campers, fishermen, boaters, bird-watchers, and others, some public comments gathered through the public scoping process indicate visitors are concerned for their safety in ORV use areas, particularly due to speeding vehicles, reckless driving, and crime.
Lake Meredith National Recreation Area Management and Operations	The NPS manages natural and cultural resources, public recreation, and associated facilities in the national recreation area. The superintendent has overall authority and uses five divisions for managing the park unit: (1) resource management, (2) law enforcement and visitor protection, (3) facility management, (4) administration, and (5) interpretation. In addition to numerous other responsibilities, national recreation area staff members are charged with enforcing closures, monitoring motorized vehicle use for general violations, and providing interpretive and educational information to visitors. The implementation of additional management measures or regulations associated with this plan/EIS has the potential to impact the day-to-day operations and management of Lake Meredith National Recreation Area.

ALTERNATIVES

The National Environmental Policy Act (NEPA) requires federal agencies to explore a range of reasonable alternatives that address the purpose of and need for the action. The alternatives under consideration must include the "no action" alternative as prescribed by 40 CFR 1502.14. Action alternatives may originate from the proponent agency, local government officials, or members of the public at public meetings or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies.

The alternatives analyzed in this document, in accordance with NEPA, are the result of internal and public scoping. These alternatives meet the management objectives of the national recreation area while also meeting the overall purpose of and need for the proposed action. Alternative elements that were considered but were not technically or economically feasible, did not meet the purpose of and need of the project, created unnecessary or excessive adverse impacts on resources, and/or conflicted with the overall management of the national recreation area or its resources were dismissed from further analysis.

ELEMENTS COMMON TO ALL ALTERNATIVES

The following describes alternative elements common to all alternatives, including the no-action alternative.

Operator/Vehicle Requirements

Vehicles operating in any ORV use area of the national recreation area must have an ORV use decal, per Texas state law.

ATV-specific operator and vehicle requirements, per Texas state law, include the following:

- ATV operators must wear eye protection and helmets approved by the Texas Department of Transportation.
- ATV operators must possess valid safety certificates issued by the state of Texas under Section 663.031 of the Texas Transportation Code.
- ATV operators under the age of 14 must be accompanied by a parent or guardian.
- ATV operators may not carry passengers unless the vehicle is designed by the manufacturer for carrying a passenger.

National Park Service Regulations

Title 36 of the CFR, "Parks, Forests, and Public Properties," is applicable in all national park units, including Lake Meredith National Recreation Area. These regulations include those in Title 36 applicable to the operation of ORVs in the park and those applicable to individuals visiting the park. Of particular note are the provisions of 36 CFR 1.5 and 1.6, which state that the superintendent may impose public use limits or may close all of the park or a portion of a park area to all public use or to a specific use or activity; may designate areas for a specific use or activity; may impose conditions or restrictions on a use or activity; and may establish a permit, registration, or reservation system.

Superintendent's Compendium

The provisions detailed in the Superintendent's Compendium define recreation area-specific regulations imposed under the discretionary authority of the superintendent of the recreation area. These provisions, as described below, are common to all alternatives, and may vary annually as the contents of the compendium change.

Campfires

The Superintendent's Compendium would continue to regulate camping-related activities, such as campfires, with additional restrictions during high fire-danger times (bans in Rosita Flats and Blue Creek follow county bans).

Education and Outreach

Under all alternatives, the park would continue to

- Provide a bulletin board at Blue Creek and Rosita Flats with campground rules and regulations and other national recreation area information
- Provide education through visitor contact with rangers, maintenance staff, and other national recreation area staff, and through on-site educational opportunities
- Provide trash bags to visitors on busy weekends
- Develop a bulletin on ORV use areas and regulations, available at the national recreation area headquarters and at ranger stations (this information would also be displayed on the Blue Creek and Rosita Flats bulletin boards on a larger scale).

NO-ACTION ALTERNATIVE

The Council on Environmental Quality (CEQ) requires that the alternatives analysis in an environmental impact statement (EIS) "include the alternative of no action" (40 CFR 1502.14[d]). The no-action alternative is developed for two reasons. First, a no-action alternative may represent the agency's past and current actions or inaction on an issue continued into the future, which may represent a viable alternative for meeting the agency's purpose and need. Second, a no-action alternative may serve to set a baseline of existing impacts against which to compare the impacts of the action alternatives.

Under alternative A (no action), the national recreation area would continue to manage ORV use at Rosita Flats and Blue Creek per the 2007 *Interim OHV Use Plan*, as well as through the regulations contained in 36 CFR 7.57 and the Superintendent's Compendium as authorized under the national recreation area's special regulation at 36 CFR 7.57. This alternative would maintain the ORV use areas at Blue Creek, along the creek bottom, officially known as "cutbank to cutbank" and at Rosita Flats below the 3,000-foot elevation line. No specific ORV routes would be established in either ORV use area.

User and operator requirements described under "Elements Common to All Alternatives" would continue to be implemented and enforced. There would also continue to be no limitation on the operating hours of vehicles in Rosita Flats and Blue Creek. There would be no established speed limits for ORV use in Rosita Flats or Blue Creek other than those on park roads as established in the CFR.

Alternative A would include camping opportunities throughout Rosita Flats and Blue Creek. There are currently no officially designated camping areas at either site, and camping could occur anywhere the

visitor can access. Campfires would continue to be regulated under the Superintendent's Compendium, and could be restricted further during times of high fire danger, which follow when county burn bans are in effect. Existing amenities in these areas, such as picnic tables and trash receptacles, as well as pit toilets at Blue Creek, would be maintained, but none would be added.

The national recreation area would continue to provide waste disposal services at Blue Creek and Rosita Flats at the same frequency as under current conditions. At Blue Creek, trash pickup would occur on a daily basis from mid-April to September and as needed, typically two to three times per week, from October to April. At Rosita Flats, trash pickup would occur once a week year-round.

Rules and regulations related to ORV use at Rosita Flats and Blue Creek would be enforced by park law enforcement officers. Current methods of enforcement that would continue include patrolling Rosita Flats, with more frequent patrols at Blue Creek due to the remote nature of Rosita Flats. During high visitor-use times or special events, the NPS may coordinate with other agencies in the area for additional law enforcement support.

No additional ORV management measures, such as establishment of user zones, use limits, or a permit system (beyond what is already required by the state), would be established.

Interpretation services would not be provided in Rosita Flats and Blue Creek. Additional education, research, and monitoring would occur, as described under "Elements Common to All Alternatives."

ACTION ALTERNATIVES

Elements that are common to all action alternatives include the following:

Operator/Vehicle Requirements—Additional operator/vehicle requirements would be implemented and would include the following:

- All ORVs would be required to have a functioning muffler system, a qualified spark arrester (ATVs only), and functioning headlights and taillights. If a vehicle does not have functioning headlights or taillights, it would be permitted to operate during the day, but not after dark.
- Vehicle mufflers on ORVs that allow more than 96 decibels of sound would be prohibited. Noise levels would be measured 20 inches from the vehicle exhaust, pursuant to the SAE J1287 standard.
- All ATVs would be required to have a triangular orange flag on top of an 8-foot pole attached to the back of the vehicle.
- All ORVs would be required to display lighted headlights and taillights after dark.

Waste Disposal—The NPS would continue to provide waste disposal services at Blue Creek and Rosita Flats and would develop new educational programs/materials for clarifying issues such as proper waste disposal techniques.

Hours of Vehicle Operation—Under the action alternatives, there would continue to be no limitation on the operating hours of vehicles in Rosita Flats and Blue Creek, except for in the designated camping areas, where non-registered motorized vehicles (such as ATVs/UTVs, dune buggies, etc.) would be prohibited from operating between 10:00 p.m. and 6:00 a.m. Visitors would be able to use their vehicles to access their camping site entrances and exits, but otherwise, quiet hours in campground areas would be between 10:00 p.m. and 6:00 a.m.

Glass Bottle Ban—All action alternatives would include a glass bottle ban in the Rosita Flats and Blue Creek ORV use areas.

Speed Limits—Speed limits in Rosita Flats and Blue Creek would be 35 miles per hour (mph) on designated routes and areas, on sandy bottom flats the speed limit would be 55 mph, and in designated camping areas the speed limit would be 15 mph.

Temporary Route and Area Closures—The Superintendent may temporarily close ORV routes and areas if resource conditions warrant. This could include closing areas that become overly rutted or closing an area after heavy rains to prevent resource damage. Once the resource condition has been corrected or conditions improve, the area would be reopened to ORV use.

Arkansas River Shiner Protection Measures

Under the action alternatives, the national recreation area would take additional steps to ensure the protection of the Arkansas River shiner. These include, but are not limited to, the following:

- Parking or staging of vehicles of any kind would be confined to areas outside the wetted channel of the Canadian River.
- ORV use within park boundaries would be restricted to designated routes. Access to the river would be allowed only from designated access points.
- ORV use zones would be established in Rosita Flats in two areas currently devoid of vegetation. One is south of the Canadian River and the other is east of Bull Taco Hill. Outside of these areas, ORVs would be permitted only on designated, marked routes. ORVs may access the riverbed area only from marked and designated access points off the designated ORV routes (alternative D only).
- A resource protection zone of approximately 1,040 acres would be established north and east of the Bull Taco Hill ORV use area to protect vegetation and reduce oil erosion. This zone would permit only vehicles with a wheel width of 64 inches or less (applies to alternatives B and D only).
- Every two to four years, aerial photography would be used to determine if use is occurring outside of designated routes and areas.
- Educational materials would be provided when the visitor receives a permit (either with cost or at no cost, depending on the alternative). Educational messages would include information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These materials could also contain the statement, "The U.S. Fish and Wildlife Service recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed."

Isolated pools are areas of water that have no connectivity between them, thus no flow entering or leaving the pool.

- Four to six times per week, on-the-ground NPS law enforcement would patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV violations. Monitoring for incidental take of Arkansas River shiner would occur at this time. Additional law enforcement patrols may occur as funding from ORV permits becomes available under the various alternatives.

- The national recreation area would monitor the shiner population every three to five years to ensure that additional management is not necessary.
- The superintendent always retains the authority to close any portion of the national recreation area for protection of park resources.
- The NPS shall develop and implement an appropriate monitoring plan for reporting progress in development of the property and implementation of the reasonable and prudent measures. Population monitoring for the Arkansas River shiner would occur every three to five years, as funding permits. The content, schedule, and format of the monitoring plan would be at the discretion of the NPS, but would take place no less than once every five years.
- The NPS would provide sufficient guidance to its employees and contracted employees to minimize incidental take and to ensure compliance with the terms and conditions of the biological opinion (USFWS 2014).
- Additional educational materials concerning Arkansas River shiner protection could be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of Arkansas River shiner conservation.

Cultural Resource Protection—Archeological resources in ORV routes or areas would be protected and access to these resources would be restricted. Should additional resources be discovered within ORV routes or areas, the resources would also be protected from ORV use.

Education and Outreach

The current education and interpretation efforts related to ORV use at Blue Creek would be expanded under all action alternatives to also include

- Providing literature and trash bags to users. Literature would contain basic safety messages (speed limits, etc). ATV rules and other national recreation area rules could be printed directly on the trash bags. NPS field staff would visit each campsite to provide this information and increase visitor contacts.
- Providing ATV safety programs in schools, including more education about ORV use at community events the national recreation area staff attends, such as the Howdy Neighbor Day in Fritch.
- Including ORV education when providing information at the annual Water Safety Day program.
- Providing information containing Lake Meredith National Recreation Area ORV use area maps and rules to local retail establishments for display.
- Increasing the number of educational signs in ORV use areas and increasing patrols.
- Establishing a volunteer group to assist with cleanup and other efforts.
- Continuing to work with Texas Off-road Association on additional outreach efforts.
- Developing “tread lightly” pamphlets for ORV use.

Research and Monitoring

Under all action alternatives, national recreation area staff would monitor ORV use areas to identify ORV use outside designated routes and areas. National recreation area staff would monitor ORV use on the ground throughout the year and close visitor-created ORV routes and areas by using physical barriers,

signs, etc., as appropriate. During monitoring, national recreation area staff would look for new trails and new signs of disturbance, including broken fence lines. Monitoring would also include a review of law enforcement records to determine how many citations are being issued for off-trail use.

Additional monitoring would be done by aerial photography. Photos would be taken of both ORV use areas every two to four years, depending on funding. National recreation area staff would use these aerial photographs to identify ORV use occurring outside designated routes and areas. National recreation area staff would provide physical barriers, signs, etc., as appropriate to prohibit ORV use on any new visitor-created routes. Additional patrols would likely resume as well.

User Capacity

The NPS defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing user capacity in national parks is inherently complex and depends not only on the number of visitors but on where visitors go, and what they do. In managing user capacity, the NPS employs a variety of management tools and strategies rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires an adaptive approach to user capacity management.

The ongoing GMP effort for Lake Meredith National Recreation Area and Alibates Flint Quarry National Monument establishes parkwide user capacity program. This program includes indicators and standards for ORV use areas in Lake Meredith National Recreation Area. Indicators and standards are measurable features that are monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the NPS ensure that desired conditions are being met.

Table ES-2 includes the indicators, standards, and potential future management strategies that could be implemented in the ORV use areas. After the most appropriate indicators were identified, standards that represent the minimum acceptable condition for each indicator were assigned. The standards incorporate qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

As monitoring of conditions continues, managers may decide to modify or add indicators if better ways are found to measure important changes in resource and social conditions. If ORV use levels and patterns change appreciably, NPS staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user capacity management program.

Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes—Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to be in conflict with one another. At Rosita Flats, two areas would be established as an ORV “area” and open to ORV use: 1) the area south of the river (currently denuded) and 2) the area east of Bull Taco hill. Access to the riverbed from the ORV use area south of the river would be from designated access points only. Outside of the two ORV use areas, ORV use would only be allowed on designated, marked routes. At Blue Creek, ORVs would only be allowed on sandy bottom areas and designated routes, with ORV use prohibited on vegetated areas. Alternative B would also institute a zoning system that would be a “layer” on top of these routes and areas, further managing use. Established zones could include camping only, hunting, resource protection, low-speed, and beginner.

TABLE ES-2: SUMMARY OF USER CAPACITY INDICATORS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES APPLICABLE TO ORV USE AREAS

Indicator	Zone	Standard	Management Strategies
Number of breaches to the designated boundary per month	ORV Semi-primitive	No more than six breaches of designated ORV boundary per month	Educate users on impacts of leaving designated ORV use areas Remotely monitor trails (for example, with cameras) Require permits Implement temporary closures
Change in campsite condition class	Developed ORV Rural Semi-primitive	No less than 15% above condition class 4 based on site condition assessment (to be measured annually)	Educate visitors in a program that includes the use of designated sites and the prohibition on camping outside designated areas; tools could include flyers, press releases, public events such as with hunters, and information postings at the visitor contact station and on waysides Mark designated campsites, survey with global positioning system equipment, and incorporate the results in the geographic information system to provide a baseline Increase enforcement
Number of incidences of camping outside designated areas	Developed ORV Rural Semi-primitive	Zero tolerance for camping in undesignated areas	Same as strategies for change in campsite condition class
Number of ticketed incidents related to damage of park resources per six-month period	Park-wide	No more than one ticketed violations related to park resources per six-month period	Provide pre-incident education Increase patrols based on locations of incidents / increase number of signs Implement more intensive mitigation measures based on resource impacted, such as applying coating that prevents graffiti from sticking, or rerouting trails Close facilities or areas if incidents continue
Number of incidences of vehicles traveling outside the designated road or route	Cultural Developed ORV Rural	Three informal roads within 0.5 mile of designated road or route	Educate visitors to increase awareness of the impacts associated with travelling on undesignated roads Increase number of signs, with carsonite poles Increase the number of patrols Close area to mitigate resource damage Physical damage and productivity

Alternative C: Management through Use of a Permit System at Current ORV Use Areas—Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except that there would be one designated ORV use area in Rosita Flats, instead of two.

Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas—Under alternative D the park would, in part, base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area but would not establish use limits. Management would include designating routes and areas, zones, and the permit system.

ENVIRONMENTAL CONSEQUENCES

Impacts of the alternatives were assessed in accordance with NPS Director's Order 12 and Handbook: Conservation Planning, Environmental Impact Analysis and Decision-Making. This handbook requires that impacts on park resources be analyzed in terms of their context, duration, and intensity. The analysis provides the public and decision-makers with an understanding of the implications of ORV management actions in the short and long term, cumulatively, and in context, based on an understanding and interpretation by resource professionals and specialists.

For each impact topic, methods were identified to measure the change in the park's resources that would occur with the implementation of each management alternative. Intensity definitions were established for each impact topic to help understand the severity and magnitude of changes in resource conditions, both adverse and beneficial.

Each management alternative was compared to baseline conditions (Alternative A: No Action – Continuation of Current Management) to determine the context, duration, and intensity of resource impacts.

The elements of all four alternatives are detailed in table ES-3. Table ES-4 details how each of these alternatives meets the objectives of the plan/EIS. Table ES-5 summarizes the results of the impact analysis for the impact topics that were assessed.

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TABLE ES-3: ALTERNATIVE ELEMENTS SUMMARY

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative A: No Action – Continuation of Current Management	Continuation of management by the 2007 *Interim OHV Use Plan* and regulations contained in the Superintendent's Compendium.	ORV use permitted at two designated areas: Rosita Flats—use authorized below the 3,000-foot elevation line. Blue Creek—use authorized in and along the creek bottom (cutbank to cutbank).	ORVs permitted in two areas in the national recreation area (Rosita Flats and Blue Creek)—in those areas, no separation of visitor uses.	No NPS vehicle permit required to operate an ORV at Rosita or Blue Creek ORV use area. A decal would be required by the state for all motorized vehicles, but not administered by the national recreation area.	No use limits in designated ORV use areas.	No limitations on the times when vehicles can operate in Rosita Flats and Blue Creek ORV use areas.	Each ATV user younger than 14 must be accompanied by a parent or guardian. ORVs may not carry passengers unless the ORV is designed by the manufacturer for carrying passengers.	All ATV operators must wear eye protection and helmets approved by the Texas Department of Transportation. Each ATV operator must possess a valid safety certificate issued by the state of Texas under Section 663.031 of the Texas Transportation Code.	No speed limits other than on national recreation area roads, as established in the CFR.	No interpretation provided at Rosita Flats or Blue Creek. Bulletin boards with campground rules and regulations and other national recreation area information located at Blue Creek and Rosita Flats. Education through visitor contact with rangers, maintenance staff, other national recreation area staff, and on-site educational opportunities. Trash bags provided on busy weekends. A site bulletin regarding ORV use at headquarters and at ranger station, and also at the Blue Creek and Rosita Flats bulletin boards on a larger scale. The bulletin boards are currently out of date.	Camping permitted at Rosita Flats and Blue Creek, without designated camping areas. Campfires regulated under the Superintendent's Compendium. Further restrictions in place during high fire-danger times (following the county burn bans). Amenities provided: Blue Creek: picnic tables, trash receptacles, pit toilets. Rosita Flats: picnic tables, trash receptacles (at entrance).	Blue Creek: Trash pickup from mid-April to September on a daily basis and as needed (two to three times per week) from October to April. Rosita Flats: Trash pickup once per week.	Rules and regulations related to ORV use at Rosita Flats and Blue Creek enforced by national recreation area law enforcement officers. Continuation of current methods of enforcement, including patrolling Rosita Flats, with more frequent patrols at Blue Creek due to the remote nature of Rosita Flats. Interagency law enforcement at large events.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Create zones in Rosita Flats and Blue Creek for various uses. In addition, implement a permit system for educational purposes that would be easy for the visitor to obtain and at no cost.	ORV use permitted at Blue Creek. The use area at Blue Creek redefined as • ORVs would only be allowed on sandy bottom areas and designated routes (figures 6 and 7 in the "Description of the Action Alternatives") section. • ORV use prohibited on vegetation. • Designated routes and camping areas marked by carsonite posts. ORV use permitted at Rosita Flats and redefined as • Area south of river (currently denuded) open to ORV use, with no designated access points to the riverbed area. • Other ORV use (outside the area described above) allowed only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off designated ORV routes. Driving on vegetation prohibited. Zoning system applied as a "layer" to these use areas, as described in the next column.	Establish a zone system in Blue Creek and Rosita Flats ORV use areas to provide for a separation of visitor uses. Zones include • ORV routes/areas. • Camping-only zones with vehicle access provided to the area but no recreational vehicle use allowed. Speeds limited to 15 mph within camping-only zones. Camping-only zones are shown on figures 6 and 7 in the "Description of the Action Alternatives" section. • Designated hunting areas zoned for an ORV closure during rifle season (would not apply to ORV use for hunting). On average, these closures would last two to eight weeks (up to two months). • New low-speed, beginner zone at loop in Rosita Flats area. • At Blue Creek a new low-speed zone for family use on either side of the Farm to Market (FM) 1913 bridge (see speed limits). • A resource protection zone in Rosita Flats where vehicles with a wheel width greater than 64 inches would not be permitted.	No-cost educational permit required for access to ORV use areas. Same permit for both ORV use areas. No limit on the number of permits issued. Permit could be obtained easily (i.e., online, at the visitor's center, and at local shops, like existing boat permits), or from rangers in the field. Permit would consist of a piece of paper or brochure and would contain ORV regulations and information. The permit would need to be signed by the operator and kept in the vehicle.	Same as alternative A.	No operation of non-registered motorized vehicles in designated campground zones/areas 10:00 p.m.–6:00 a.m. All ORVs must display lighted headlights and taillights after dark.	Same as alternative A, plus: All ORVs must have a muffler, spark arrester, and functioning headlights and taillights. Muffler requirements—96 decibel limit for ORVs. Park rangers to use decibel meters to measure.	Same as alternative A, plus: All ATVs must have a triangular orange flag on top of an 8-foot pole attached to the back of the ATV.	Speed limit of 15 mph in camping-only zones. Outside these areas, a speed limit of 35 mph on all ORV routes and 55 mph on sandy bottom flats. A lower speed limit (could be 15 mph) within sight of the bridge at Blue Creek (about a half mile in either direction)—signs painted on bridge pillars (creates a low-speed use zone for families to play in the water; see "zone system" column). In Rosita Flats, provide a lower speed limit for beginner loop (less than 20 mph).	Same as alternative A, plus: • Provide safety literature and trash bags to users. ORV and other rules could be printed on the trash bags. Rangers seek out visitors and provide this information and increase visitor contacts. • Provide ORV safety programs in schools and attend Fritch Howdy Neighbor Day. • Increase education about ORVs at community events the national recreation area staff attends. • Add ORV education to Water Safety Day. • Provide signs to local businesses containing Lake Meredith National Recreation Area ORV use area map and rules. • Increase educational signs in ORV use areas. • Establish a volunteer group to assist with cleanup and other efforts. • Develop "tread lightly" pamphlet for ORV use.	Designated camping zones with lower speed limit. Picnic tables and fire pits in these areas as funding allows (not funded through the permit system). No camping in designated ORV routes or areas. No additional amenities provided beyond alternative A (except for designated camping areas).	Same as alternative A, plus: Add waste management issues to educational components.	Law enforcement staff levels increased. ORV use outside designated routes and areas could cause routes/areas to close temporarily. Post signs prohibiting ORV use in areas of isolated pools during times of drought.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Manage ORV use (including level of use) with a permit system with a fee at Rosita Flats and Blue Creek. Develop a monitoring plan and criteria for use limits.	Blue Creek: Same as alternative B. Rosita Flats: Same as alternative B, except there is no designated ORV use area east of Bull Taco Hill.	Same as alternative A.	Fee permit required to access the ORV use areas. Price structure consistent with boat permits. Permits available for $4/day, $10/three days, and $40/year. Same permit for both ORV use areas. Potential for limits on number of permits based on results of use limit studies. Permits available via mail, at headquarters, online, or at other vendors. A kiosk and "Iron Ranger" could be used to supply daily permits. Permit would take the form of a bumper sticker on the ORV (even those brought in by trailer). Provide permit holders with a Lake Meredith National Recreation Area ORV regulations brochure.	Develop use limits based on indicators and standards developed through the GMP planning process. Criteria developed and monitored to determine when the use limit is reached. Develop monitoring plan to describe these studies and how the implementation of use limits would be achieved.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Same as alternative B, plus: interpretive wayside program starting at Blue Creek and expanding as necessary. Cost of program covered by permit fee.	Designated camping areas with lower speed limits would be established for tent and vehicle camping. Establish fire pits and designated campsites using funds from permit fees. No camping on designated ORV routes. Outside designated camping areas, tent camping would be permitted in areas that have no vegetation or previously disturbed vegetation. Visitors in these areas would be required to walk into their campsites because vehicles must be parked off vegetation along designated ORV routes or areas. Pit toilets, fire rings, and picnic tables in the designated camping areas would be provided, on a phased basis. While these would be the priority, other amenities could include shade shelters, emergency call stations, and additional kiosks and bulletin boards for more information.	Same as alternative B.	Law enforcement staff levels increased and additional law enforcement resources provided using funds from permit fees. Explore options for having law enforcement staff located closer to the Rosita Flats ORV use area. Develop a monitoring plan that looks at vegetation, erosion, and other predetermined factors. Aerial imagery to track new visitor-created routes/ noncompliance. ORV use outside designated routes and areas could cause routes/areas to close temporarily.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas	Develop a permit system with a fee to allow NPS to provide additional amenities and increase enforcement in the two ORV use areas. No user capacity established.	ORV use permitted at Blue Creek as described under alternative B. ORV use permitted at Rosita Flats and redefined as • Area south of river (currently denuded) open to ORV use. Designated access points to the riverbed area would be established. • Area east of Bull Taco Hill open to ORV use. • Other ORV use (outside the area described above) allowed only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off designated ORV routes. Driving on vegetation prohibited. A zoning system would be applied as a "layer" to these use areas, as described in the next column.	Establish a zone system in Blue Creek and Rosita Flats ORV use areas to provide for a separation of visitor uses. Zones include • ORV routes/areas. • Camping-only zones with vehicle access provided to the area but no recreational vehicle use allowed. Speeds limited to 15 mph within camping-only zones. Camping-only zones are shown on figures 6 and 7 in the "Description of the Action Alternatives" section. • Designated hunting areas zoned for an ORV closure during rifle season (would not apply to ORV use for hunting). On average, these closures would last two to eight weeks (up to two months). • New low-speed, beginner zone at loop in Rosita Flats area. • At Blue Creek a new low-speed zone for family use on either side of the FM 1913 bridge (see speed limits). • A resource protection zone in Rosita Flats where vehicles with a wheel width greater than 64 inches would not be permitted.	Fee permit required to access the ORV use areas. Price based on consistency with boat permits. Permits available for $4/day, $10/three days, and $40/year. Same permit for both ORV use areas. Permits available via mail, at headquarters, online, or at other vendors. A kiosk and "Iron Ranger" could be used supply daily permits. Permit would take the form of a bumper sticker on the ORV (even those brought in by trailer). Permit holders would also receive a Lake Meredith National Recreation Area ORV regulations brochure.	Same as alternative A.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Speed limit of 15 mph in camping-only zones. Outside these areas, a speed limit of 35 mph on all ORV routes and 55 mph on sandy bottom flats. A lower speed limit (could be 15 mph) within sight of the bridge at Blue Creek (about a half mile in either direction)—signs painted on bridge pillars (creates a low-speed use zone for families to play in the water; see "zone system" column). In Rosita Flats, provide a lower speed limit for beginner loop (less than 20 mph).	Same as alternative B, plus: Install fencing and signs around ORV use boundary at Rosita Flats to better define ORV use in this area.	Designated camping zones with lower speed limit. Picnic tables and fire pits as funding allows (through the permit system) in these areas. No camping in designated ORV routes or areas. Pit toilets, fire rings, and picnic tables in the designated camping zones provided, on a phased basis. While these would be the priority, other amenities could include shade shelters, emergency call stations, and additional kiosks and bulletin boards for more information.	Same as alternative B.	Law enforcement staff levels increased and additional law enforcement resources provided using funds from permit fees. Explore options for having law enforcement staff located closer to the Rosita Flats ORV use area. Develop a monitoring plan that looks at vegetation, erosion, and other predetermined factors. Aerial imagery to track new visitor-created routes/ noncompliance. ORV use outside designated routes and areas could cause routes/areas to close temporarily.

TABLE ES-4: ANALYSIS OF HOW ALTERNATIVES MEET OBJECTIVES

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Visitor Use and Safety				
Manage ORV use to minimize conflicts among different ORV users.	Does not meet this objective because there would be no separation of uses (e.g., camping) in the ORV use areas, no established ORV routes, and no speed limits. Visitors with varying skills, interests, and expectations would use the areas together.	Fully meets this objective by establishing routes for ORV use in both Blue Creek and Rosita Flats. Camping-only zones would be designated, with reduced ORV speed. Low-speed and beginner zones would also be designated to provide areas for riders of specific skill levels. Recreational ORV use would be prohibited during hunting season. These options would separate users, allow increased variety of ORV use, and eliminate the recreational ORV / hunting conflict; a revocable ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts.	Meets this objective to a large degree by designating ORV routes in both Blue Creek and Rosita Flats. Establishes designated camping areas, improves visitor amenities, and could provide "camp hosts" to assist visitors. An ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts. If conditions warrant, a use limit could be implemented.	Fully meets this objective by establishing routes for ORV use in both Blue Creek and Rosita Flats. Camping-only zones would be designated, with reduced ORV speeds. Low-speed and beginner zones would also be designated to provide areas for riders of specific skill levels. Recreational ORV use would be prohibited during hunting season. These options would separate users, allow increased variety of ORV use, and eliminate the recreational ORV / hunting conflict; a revocable ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts. In addition, an ORV permit would increase NPS ability to manage for inappropriate use, and could result in reduced visitor conflict.
Promote the safe operation of ORVs and safety of all visitors.	Meets this objective to some degree by requiring standard rider protection, Texas safety certification, and parental presence for young riders. However, alternative A would not implement speed limits, riders of varying skill level would not be separated, and there would be no requirements for safety items on ORVs.	Fully meets this objective by implementing measures common to alternatives B, C, and D, separating users of various skill levels, establishing speed limits and use zones, and requiring safety items on ORVs and riders. Camping and riding areas would be separated, and recreational ORV use would not be allowed in hunting areas during hunting season; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area.	Meets this objective to a large degree by implementing measures common to alternatives B, C, and D; camping and riding areas would be separated; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area; and visitor capacity could be established if conditions warrant.	Fully meets this objective by implementing measures common to alternatives B, C, and D; separating users of various skill levels; establishing speed limits and use zones; and requiring safety items on ORVs and riders. Camping and riding areas would be separated, and recreational ORV use would not be allowed in hunting areas during hunting season; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area.
Management				
Build stewardship through public awareness and understanding of NPS resource management and visitor use policy and responsibilities as they pertain to the national recreation area and ORV management.	Meets this objective to some degree by continuing NPS education, interpretation, and enforcement in the ORV use areas.	Meets this objective to a moderate degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. Establishes resource protection zones that would reduce impacts on vegetation and soils and fence ORV use areas, which would reduce impacts on wildlife.	Meets this objective to a large degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. The implementation of a permit system with an educational emphasis would also promote further understanding of national recreation area resources.	Meets this objective to a large degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. The implementation of a permit system with an educational emphasis would also promote further understanding of national recreation area resources.
Natural Resources				
Minimize adverse impacts on threatened, endangered, and other protected species and their habitats.	Does not meet this objective because formal plans to reduce direct and indirect impacts on the Arkansas River shiner and its habitat would not be implemented.	Meets this objective to a large degree by establishing resource protection zones that would reduce impacts on vegetation and soils, indirectly benefiting the Arkansas River shiner by reducing erosion and impacts on water quality and through implementation of the measures outlined in the biological opinion. Restricting ORV traffic from isolated pools of water during drought would reduce direct impacts on the Arkansas River shiner and its habitat.	Meets this objective to a large degree by allowing ORV travel only on sandy bottoms and designated routes in Blue Creek and confining ORVs to denuded areas and designated routes in Rosita Flats. Would establish a use limit based on desired conditions for resources (including threatened and endangered) to be identified in ongoing GMP process and would implement species protection measures outlined in the biological opinion.	Meets this objective to a large degree by establishing resource protection zones that would reduce impacts on vegetation and soils, indirectly benefiting the Arkansas River shiner by reducing erosion and impacts on water quality and through implementation of the measures outlined in the biological opinion. Restricting ORV traffic from isolated pools of water during drought would reduce direct impacts on the Arkansas River shiner and its habitat.
Define effective strategies for soil erosion control and the restoration of plant resources to support wildlife populations.	Does not meet this objective because no formal plans to reduce erosion or impacts on vegetation would be established.	Meets this objective to a moderate degree by establishing resource protection zones, designating routes for a variety of ORV uses, restricting ORVs from vegetated areas, and clearly marking areas where ORV use is allowed.	Meets this objective to a moderate degree by allowing ORV travel only on sandy bottoms and designated routes in Blue Creek and confining ORVs to denuded areas and designated routes in Rosita Flats. Would establish a use limit based on desired conditions for resources to be identified in ongoing GMP process.	Meets this objective to a moderate degree by establishing resource protection zones, designating routes for a variety of ORV uses, restricting ORV from vegetated areas, and clearly marking areas where ORV use is allowed.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
National Recreation Area Operations				
Identify ORV plan implementation needs and costs.	Meets objective to a large degree. Through the ORV planning process, all costs for plan implementation would be identified.	Meets objective to a large degree. Through the ORV planning process, all costs for plan implementation would be identified.	Fully meets this objective. Through the ORV planning process, all costs for plan implementation would be identified. In addition, a fee-permit system would allow for a level of cost recovery for administering ORV management at the national recreation area.	Fully meets this objective. Through the ORV planning process, all costs for plan implementation would be identified. In addition, a fee permit system would allow for a level of cost recovery for administering ORV management at the national recreation area.
Minimize national recreation area operations and cost impacts as the result of implementing an ORV plan.	Does not meet this objective because ORV users would not pay fees to support services or restore damage done by ORV use.	Does not meet this objective because ORV users would not pay fees to support services or restore damage done by ORV use.	Meets this objective to a large degree by implementing a fee structure to cover costs of ORV visitor amenities, resource monitoring, and restoration needs associated with ORV use.	Fully meets this objective by implementing a fee structure to cover costs of ORV visitor amenities, resource monitoring, and restoration needs associated with ORV use.

TABLE ES-5: ENVIRONMENTAL IMPACT SUMMARY BY ALTERNATIVE

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Soils	Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized major adverse impacts on soils. Incremental contributions to soil erosion would be most notable at the extreme edges of the cutbanks and the eastern extent of the Blue Creek ORV use area and at the edges of the Rosita Flats ORV use area. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term major adverse impacts of alternative A, would result in long-term moderate adverse cumulative impacts on soil resources.	Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from educational measures provide increased awareness and behavior modification among ORV users. Incremental contributions to soil erosion would result from the intensification of uses in certain areas, such as the proposed beginner zone and designated camping areas, and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative B, would result in long-term moderate adverse cumulative impacts on soils.	Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in localized long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses at certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in-only camping. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative C, would result in long-term moderate adverse cumulative impacts on soils.	Under alternative D, continued ORV use and management at Blue Creek and Rosita Flats would result in localized long-term minor to moderate impacts. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses in certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of no-camping zones around vegetated areas. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term minor to moderate adverse impacts of alternative D, would result in long-term minor to moderate adverse cumulative impacts on soils.
Vegetation	Localized short- and long-term moderate adverse effects on vegetation would occur under alternative A as a result of localized impacts, including damage to plants; erosion, which can result in further loss of vegetation; reduction in soil productivity, which can affect natural recovery; and the potential introduction or spread of nonnative plants. The parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the localized short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in localized long-term moderate adverse cumulative impacts on vegetation.	Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. These adverse impacts would occur in fewer vegetated areas under alternative B because more of the land would be closed to ORVs compared to under alternative A. The designation of ORV routes and areas would allow previously disturbed vegetated areas the opportunity to recover. As a result, there would be long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.	Localized short- and long-term minor adverse impacts on vegetation would occur in areas open to ORV use. However, there would be impacts in fewer vegetated areas because several areas would be closed to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.	Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. However, impacts would occur in fewer vegetated areas because only designated routes and specific areas would be open to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.
Water Resources	Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized moderate adverse impacts on water quality due to ongoing disturbances under current management that would continue to impact surface water quality in the ORV use areas. Sedimentation of surface waters in Lake Meredith would continue to result from the ongoing erosion of soils due to ORV use. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative A, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor to moderate adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in short- to long-term localized minor to moderate adverse impacts on water resources. Impacts on water quality would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in -only camping. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative D, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be offset by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on water resources.
Soundscapes and the Acoustic Environment	The effects of alternative A on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative A on soundscapes at Rosita Flats would be long term, moderate, and adverse. Cumulative impacts on soundscapes would be long term, minor to moderate, and adverse.	The effects of alternative B on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative B on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.	The effects of alternative C on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative C on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.	The effects of alternative D on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative D on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Wildlife and Wildlife Habitat	Localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat would result from species disturbance and displacement, habitat damage and fragmentation, and individual mortality. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to continued use of ORVs in the Rosita Flats and Blue Creek ORV use areas, impacts would be less than under alternative A as a result of increased resource management. The use of a zone system, including a resource protection zone, as well as restrictions on driving in isolated pools in times of drought, designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Therefore, overall impacts under alternative B would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to the continued use of ORVs in the Blue Creek and Rosita Flats ORV use areas, the impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative C. The development of a monitoring plan and interpretive wayside program, the implementation of use limits and permitting system, the designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term minor adverse impacts of alternative C, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although the continued use of ORVs at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat, impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative D. The implementation of a zoning system and fee-based permitting system, as well as the enactment of resource protection rules, such as the headlight/taillight and muffler requirements and the prohibition on driving on vegetation, would result in long-term beneficial impacts on wildlife and wildlife habitat at the Blue Creek and Rosita Flats ORV use areas. Additional beneficial impacts would result from prohibitions on driving through isolated pools, establishing designed access point to the river, and implementing protection measures for the Arkansas River shiner (which would also benefit other species). Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor adverse impacts under alternative D, would result in long-term minor adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.
Threatened and Endangered Species / Species of Concern	Under alternative A, short- and long-term moderate adverse effects on the Arkansas River shiner could occur as a result of localized impacts including disturbance, mortality, or damage to/loss of habitat. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse cumulative impacts on the Arkansas River shiner.	Short- and long-term moderate adverse impacts on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the use of a zone system, including a resource protection zone, as well as designating ORV access points at the riverbed and restrictions on driving in isolated pools in times of drought, and the other protection measures outlined in the biological opinion would help mitigate these adverse impacts on Arkansas River shiner habitat. Therefore, overall impacts under alternative B would be short and long term, minor to moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.	Short- and long-term moderate adverse effects on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the implementation of use limits, a fee-based permit system, the designation of ORV access points at the riverbed, and increased resource management, as well as other protection measures resulting from the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the Arkansas River shiner and its associated habitat. Therefore, the overall impacts of implementing alternative C would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.	Although the continued use of ORVs at Rosita Flats would result in short- and long-term moderate adverse impacts on the Arkansas River shiner in localized areas, impacts would be less than under alternative A due to increased resource management which would result in long-term beneficial impacts, but there would be long-term minor adverse impacts. The implementation of a zoning system and fee-based permit system as well as the resource protection measures that would be implemented as part of the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the shiner at Rosita Flats. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor to moderate adverse impacts under alternative D, would result in long-term minor to moderate adverse impacts on the Arkansas River shiner.
Archeological Resources	Alternative A would result in continued potential long-term major adverse impacts on archeological resources along or near open ORV use areas, routes, or access points. Cumulative impacts would be long term, major, and adverse.	Alternative B would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Measures would be implemented to restrict access to the sensitive areas. Cumulative impacts would be long term, minor to moderate, and adverse.	Alternative C would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points; where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.	Alternative D would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Visitor Use and Experience / Health and Safety	Under alternative A there would be no change to the current visitor use and experience, access, or recreational opportunities. The current safety risk of unregulated ORV use in the national recreation area would remain the same. As a result, impacts on visitor use and experience / health and safety would be long term, moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the long-term moderate adverse impacts under alternative A, would result in long-term minor to moderate adverse cumulative impacts on visitor use and experience / health and safety.	Although the establishment of zones and the implementation of a permit system would have adverse impacts for the majority of visitors by requiring visitors to obtain an ORV permit, beneficial impacts would result from the separation of visitor uses, improved safety, and enhanced resource conditions at the national recreation area. A minority of users would experience moderate adverse effects by loss of access to the resource protection zone and temporary loss of the hunting zone in Rosita Flats. Some users could experience long-term negligible to minor adverse impacts because the potential for user conflicts may arise with hunters not using ORVs in the hunting zone. Overall, impacts under alternative B would be long term, minor to moderate, and adverse as well as long term and beneficial for ORV users at the national recreation area. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.	The proposed permit fee, while being an additional cost to visitors, would create more visitor amenities that would enhance visitor use and experience at the national recreation area. Additionally, a greater presence of law enforcement, as well as the rangers' ability to revoke ORV permits, may cause visitor violations and illegal activity to decrease. As a result, impacts under alternative C would be long term, minor, and adverse, because users would need to adjust to a user fee, as well as long term and beneficial from enhanced safety and additional amenities, ORV rules, and education. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.	The proposed permit fee, while being an additional cost to visitors, would fund more visitor amenities that would enhance visit use and experience at the national recreation area. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease, which would have beneficial effects on visitor health and safety. Additionally, the establishment of zones and implementation of a permit system would have beneficial impacts for the majority of visitors by separating uses, implementing rules (speed limits, headlights, and orange flags for ATVs), education, improving safety, and enhancing resource conditions at the national recreation area. Overall, impacts under alternative D would be long term, minor to moderate, and adverse, because users would need to adjust to a user fee and a zoning system, and long term and beneficial due to improvements to visitor use and experience / health and safety. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative D, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.
Lake Meredith National Recreation Area Management and Operations	Staffing and funding levels would continue at the same levels as currently managed. The total approximate cost of implementing alternative A would be $315,000. Actions under alternative A would result in long-term negligible adverse impacts because there would be no noticeable change in national recreation area management and operations. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative A, would result in parkwide long-term negligible to minor adverse impacts on national recreation area management and operations.	The implementation of alternative B would require additional efforts from park staff. Law enforcement staff levels would be increased to ensure compliance with the additional regulations under alternative B. Additionally, there would be an increase in responsibilities for the interpretation and resource management staff. The total approximate cost of implementing alternative B would be $1,775,000. The implementation of alternative B would result in long-term minor to moderate adverse impacts on national recreation area management and operations, with impacts more moderate than minor because a fee permit system would not be in place to help offset additional expenses. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative B, would result in long-term minor to moderate adverse impacts.	The implementation of alternative C would require additional efforts from national recreation area staff in the areas of law enforcement, resource management, interpretation, and facilities management, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative C would be $442,500 and would be offset, in part, by money collected in the proposed fee system. The implementation of alternative C would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative C, would result in long-term minor to moderate adverse cumulative impacts.	The implementation of alternative D would require additional efforts from park staff in the area of law enforcement, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative D would be $1,775,000. The implementation of alternative D would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative D, would result in long-term minor to moderate adverse cumulative impacts.

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Acronyms

ASMIS	Archeological Sites Management Information System
ASU	Arizona State University
ATV	all-terrain vehicle
BOR	Bureau of Reclamation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRMWA	Canadian River Municipal Water Authority
dBA	A-weighted decibel
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FM	farm to market
GIS	Geographical Information System
GMP	general management plan
mph	miles per hour
MTBE	methyl tertiary butyl ether
NEPA	National Environmental Policy Act
NPOMA	National Parks Omnibus Management Act
NPS	National Park Service
OHV	off-highway vehicle
ORV	off-road vehicle
PEPC	Planning, Environment and Public Comment
plan/EIS	ORV Management Plan / Environmental Impact Statement
ROI	region of influence
TCEQ	Texas Department of Environmental Quality
TMDL	total maximum daily load
TPWD	Texas Parks and Wildlife Department
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
UTV	utility terrain vehicle

Purpose of and Need for Action

CHAPTER 1

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

This "Purpose of and Need for Action" chapter explains what the Lake Meredith National Recreation Area Off-road Management Plan / Environmental Impact Statement (plan/EIS) intends to accomplish and why the National Park Service (NPS) is taking action at this time to evaluate a range of alternatives and management actions for off-road vehicle (ORV) use at Lake Meredith National Recreation Area (the national recreation area). This plan/EIS presents three action alternatives for managing ORV use and assesses the impacts that could result from continuing current management (the no-action alternative) or from the implementation of any of the action alternatives. An ORV is considered to be any type of vehicle that is capable of driving on and off a paved or gravel surface.

This "Purpose of and Need for Action" chapter explains what the plan/EIS intends to accomplish and why the NPS is taking action at this time to evaluate a range of alternatives and management actions for ORV use at the national recreation area.

Upon conclusion of this plan/EIS and decision-making process, the alternative selected for implementation will become the ORV management plan, which will guide the management and control of ORVs at the national recreation area for the next 15 to 20 years. The plan will also form the basis for a special regulation to manage ORV use at the national recreation area. Brief summaries of the purpose and need are presented here; however, more information is available in the section titled "Lake Meredith National Recreation Area Background."

PURPOSE OF THE PLAN / ENVIRONMENTAL IMPACT STATEMENT

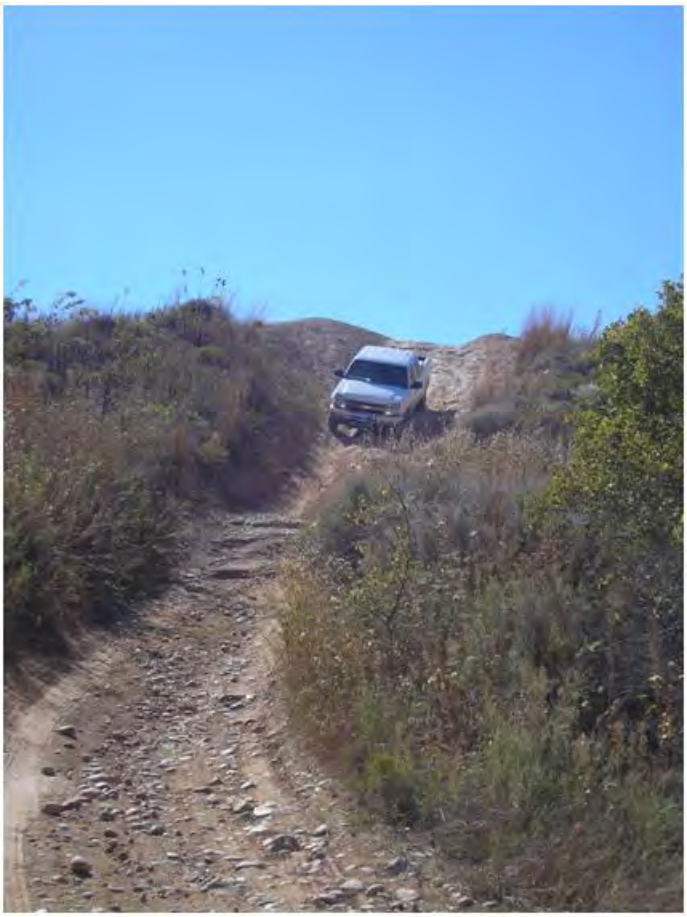
The purpose of this plan/EIS is to manage ORV use in the national recreation area for visitor enjoyment and recreation opportunities, while minimizing and correcting damage to resources.

NEED FOR ACTION

The Lake Meredith National Recreation Area provides a variety of visitor experiences, including the use of ORVs. In the 1970s, a special regulation in Title 36 of the Code of Federal Regulations (CFR), Section 7.57, designated two authorized ORV use areas in the national recreation area: Blue Creek at the north end and Rosita (also known as Rosita Flats) at the south end. ORV use at the national recreation area has changed drastically since the establishment of the special regulation and the first use of ORVs, both in intensity and in the types of ORVs used. Modern all-terrain vehicles (ATVs) are the primary ORVs used today; however, they were not in use when the original regulations took effect. The intensity of ORV use at the national recreation area affects natural and cultural resources and results in visitor use conflicts.

ORV use at the national recreation area has changed drastically since the establishment of the special regulation and the first use of ORVs, both in intensity and in the types of ORVs used.

In addition to providing recreation opportunities, the national recreation area is home to the Arkansas River shiner (*Notropis girardi*), a federally threatened aquatic species.



ORV Use in Lake Meredith National Recreation Area

Executive Order 11644, "Use of Off-road Vehicles on the Public Lands" (issued in 1972 and amended by Executive Order 11989 in 1977), requires federal agencies that allow ORV use to designate specific areas and routes on public lands where the use of ORVs may be allowed. Therefore, motorized travel off established roads would not be permitted in any areas unless designated under a special regulation. Section 3 of this executive order, as amended, authorizes the NPS to designate ORV use areas provided that the designation of such areas and trails will be based on protecting the resources of public lands, promoting the safety of all users of those lands, and minimizing conflicts among the various uses on those lands. Executive Order 11644 was issued in response to the widespread and rapidly increasing use of ORVs on public lands "often for legitimate purposes but also in frequent conflict with wise land and resource management practices, environmental values, and other types of recreational activity." Title 36 of the CFR, Section 4.10(b), contains regulations regarding vehicles and traffic safety on NPS lands and requires that "routes and areas designated for ORV use shall be promulgated as special regulations" and that the designation of routes and areas "shall comply with §1.5 of this chapter and [Executive Order] 11644" (Volume 37 Federal Register, p 2877 [37 FR 2877]). In addition, such routes and areas may be designated only in national recreation areas, national seashores, national lakeshores, and national preserves.

As a result of these considerations, an ORV management plan for Lake Meredith National Recreation Area is needed at this time to

- Comply with Executive Order 11644, Use of Off-road Vehicles on Public Lands, as stated in *Friends of the Earth v. Department of Interior*
- Provide for sustainable recreational ORV use areas
- Address the lack of an approved plan, which has led to ORV use outside authorized areas
- Address resource impacts resulting from ORV use
- Address the change in numbers, power, range, and capabilities of ORVs.

OBJECTIVES IN TAKING ACTION

Objectives are "what must be achieved to a large degree for the action to be considered a success" (NPS 2001). All alternatives selected for detailed analysis must meet project objectives to a large degree and resolve the purpose of and need for action. Objectives must be grounded in the national recreation area's enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided by the national recreation area's general management plan (GMP), strategic plan, and/or other management guidance. National recreation area staff identified the following objectives for developing this plan/EIS.

Objectives are "what must be achieved to a large degree for the action to be considered a success." All alternatives selected for detailed analysis must meet project objectives to a large degree and resolve the purpose of and need for action.

VISITOR USE AND SAFETY

- Manage ORV use to minimize conflicts among different ORV users.
- Promote safe operation of ORVs and safety of all visitors.

MANAGEMENT

- Build stewardship through public awareness and understanding of NPS resource management and visitor use policy and responsibilities as they pertain to the national recreation area and ORV management.

NATURAL RESOURCES

- Minimize adverse impacts on threatened, endangered, and other protected species and their habitats.
- Define effective strategies for soil erosion control and restoration of plant resources to support wildlife populations.

NATIONAL RECREATION AREA OPERATIONS

- Identify ORV plan implementation needs and costs.
- Minimize national recreation area operations and cost impacts as the result of implementing an ORV plan.

PROJECT STUDY AREA

The geographic study area for this plan/EIS is Lake Meredith National Recreation Area in Texas (figure 1), unless otherwise noted under each resource topic. Although the entire national recreation area is within the study area, the plan/EIS will focus on the Blue Creek and Rosita Flats areas, as shown in figures 2 and 3, which are the only two areas that are designated for ORV use, also known as off-highway vehicle (OHV) use by the state of Texas and in some park planning documents.

LAKE MEREDITH NATIONAL RECREATION AREA BACKGROUND

HISTORY OF LAKE MEREDITH NATIONAL RECREATION AREA

Lake Meredith was originally created by the construction of the Sanford Dam on the Canadian River in 1965, referred to as the Canadian River Project (CRMWA 2008). The Sanford Dam was designed and built by the Bureau of Reclamation (BOR) to allow impoundment and diversion of water for municipalities in the Texas panhandle, including Amarillo, Borger, Brownfield, Lamesa, Levelland, Lubbock, O'Donnell, Pampa, Plainview, Slaton, and Tahoka. The NPS became involved with the recreational use of the area in 1961 through a memorandum of understanding and agreement with the BOR (Contract No. 14-06-500-579) (NPS 1973). This agreement authorized the NPS to investigate, plan, and develop recreational resources for the Canadian River Project. In March 1964, another memorandum of agreement between the NPS and the BOR established that the public recreational use for the Canadian River Project area would be the responsibility of the NPS. By 1968, the BOR turned over the operation and maintenance of the Sanford Dam and associated facilities to the Canadian River Municipal Water Authority (CRMWA), resulting in a cooperative effort between the NPS and the CRMWA for the management of the reservoir and its facilities (NPS 1973). This reservoir was referred to as the Sanford Recreation Area until 1974, when it was renamed to Lake Meredith Recreation Area in honor of A. A. Meredith, a civic leader and early promoter of the lake (Texas State Historical Association 2008).

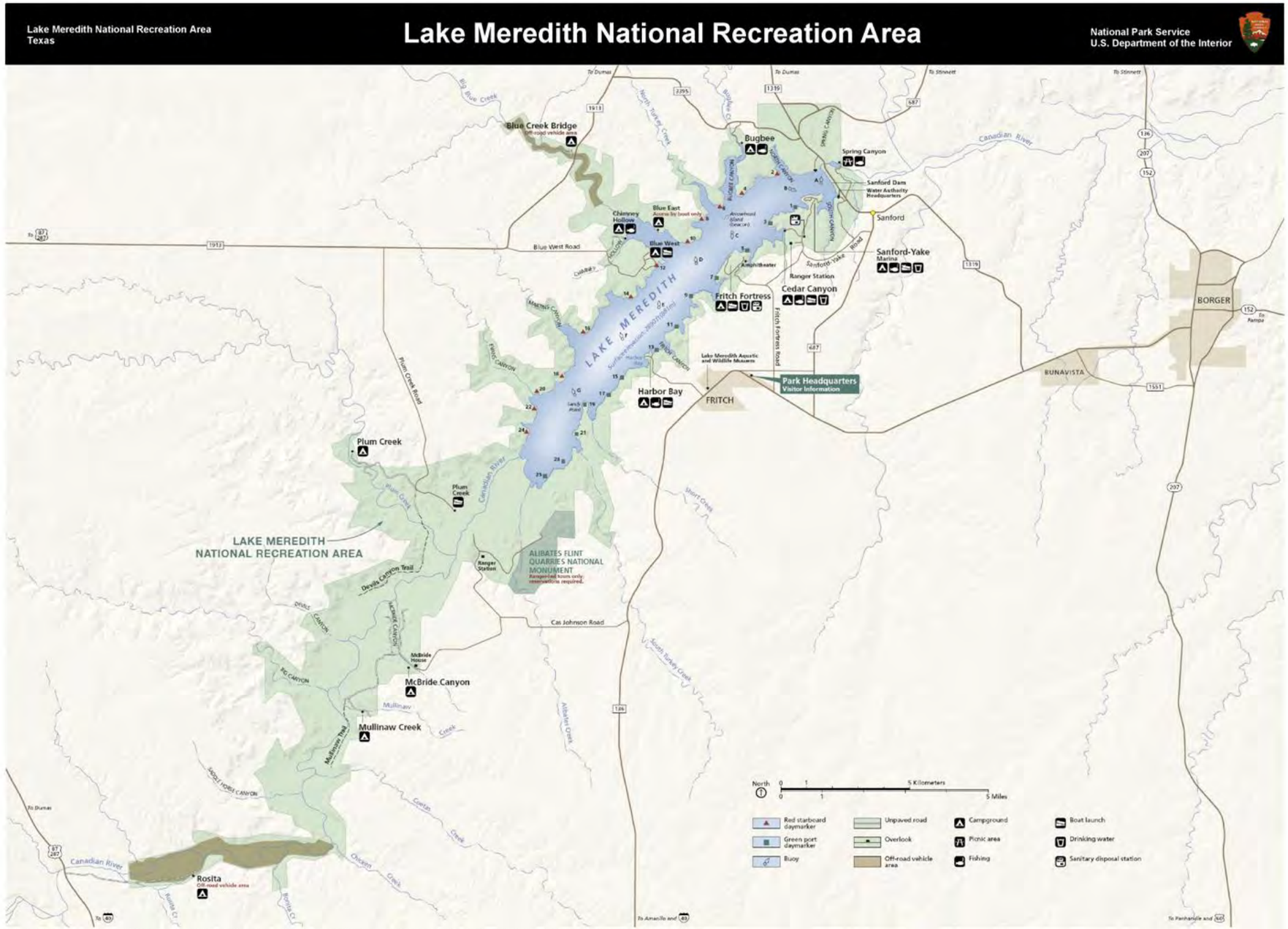
On November 28, 1990, Public Law 101-628, 16 U.S. Code (USC) 460eee, established the area as NPS land, stating, "In order to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters, there is hereby established the Lake Meredith National Recreation Area." The national recreation area, containing over 44,977 acres, preserves one of the largest manmade lakes in the Texas panhandle, many archeological sites, and flora and fauna of the area, making it a valuable part of American heritage. From 1971 through 2008, over 55 million people visited the national recreation area, which is an average of almost 1.5 million visitors annually (NPS 2009j).

PURPOSE AND SIGNIFICANCE OF LAKE MEREDITH NATIONAL RECREATION AREA

All units of the national park system were established for a specific purpose and to preserve significant resources or values for the enjoyment of future generations. The purpose and significance identify uses and values that individual NPS plans should support. The following provides background on the purpose and significance of Lake Meredith National Recreation Area.

As stated in the national recreation area's enabling legislation, Congress established Lake Meredith National Recreation Area in 1990 "to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters" (16 USC 460eee) (Public Law 101-628).

As stated in the national recreation area's enabling legislation, Congress established Lake Meredith National Recreation Area in 1990 "to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters."



* Due to seasonal and historic fluctuations in water level, shoreline as displayed here may not accurately reflect current conditions.

FIGURE 1: LAKE MEREDITH NATIONAL RECREATION AREA MAP

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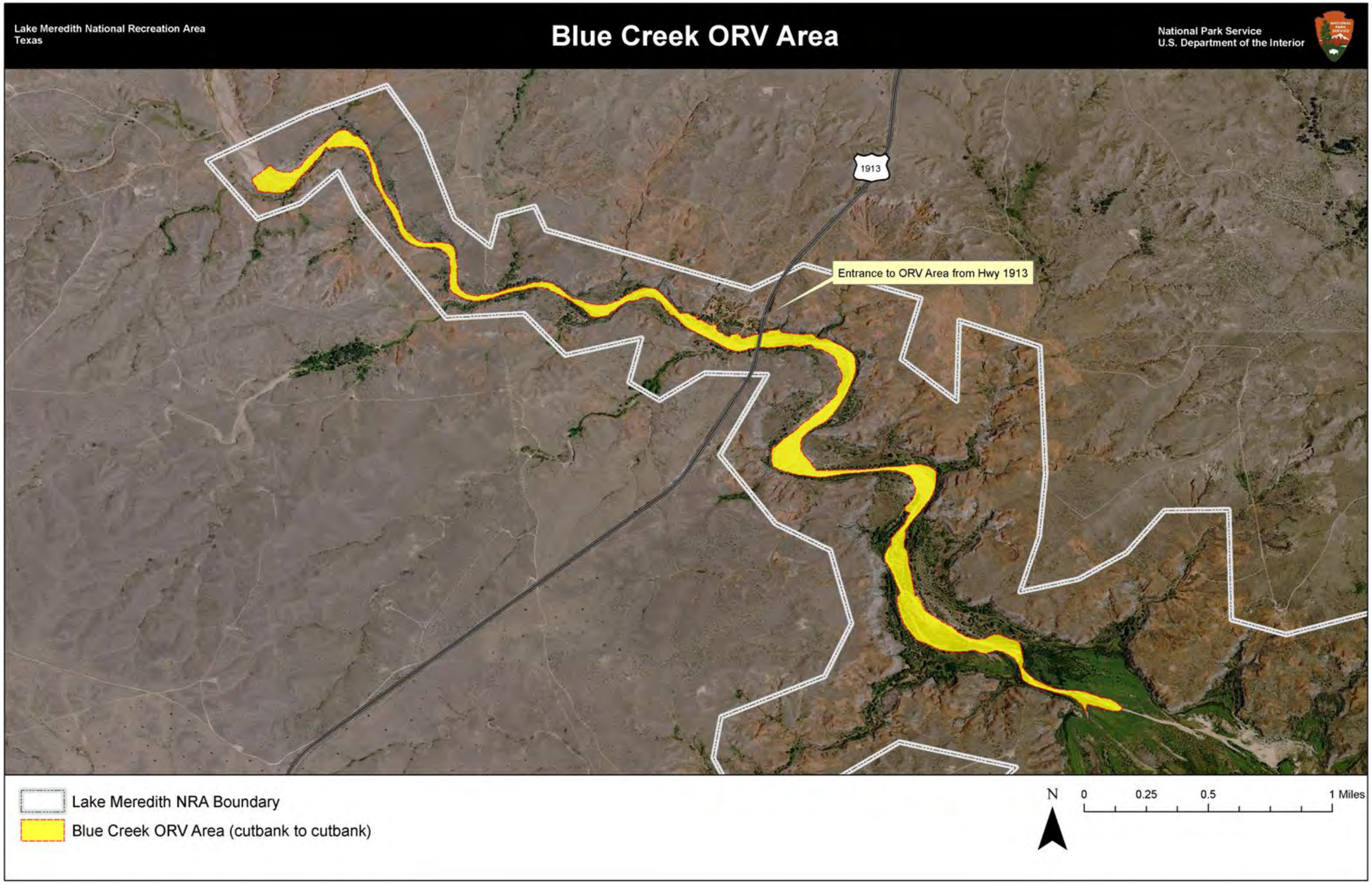

FIGURE 2: BLUE CREEK OFF-ROAD VEHICLE AREA

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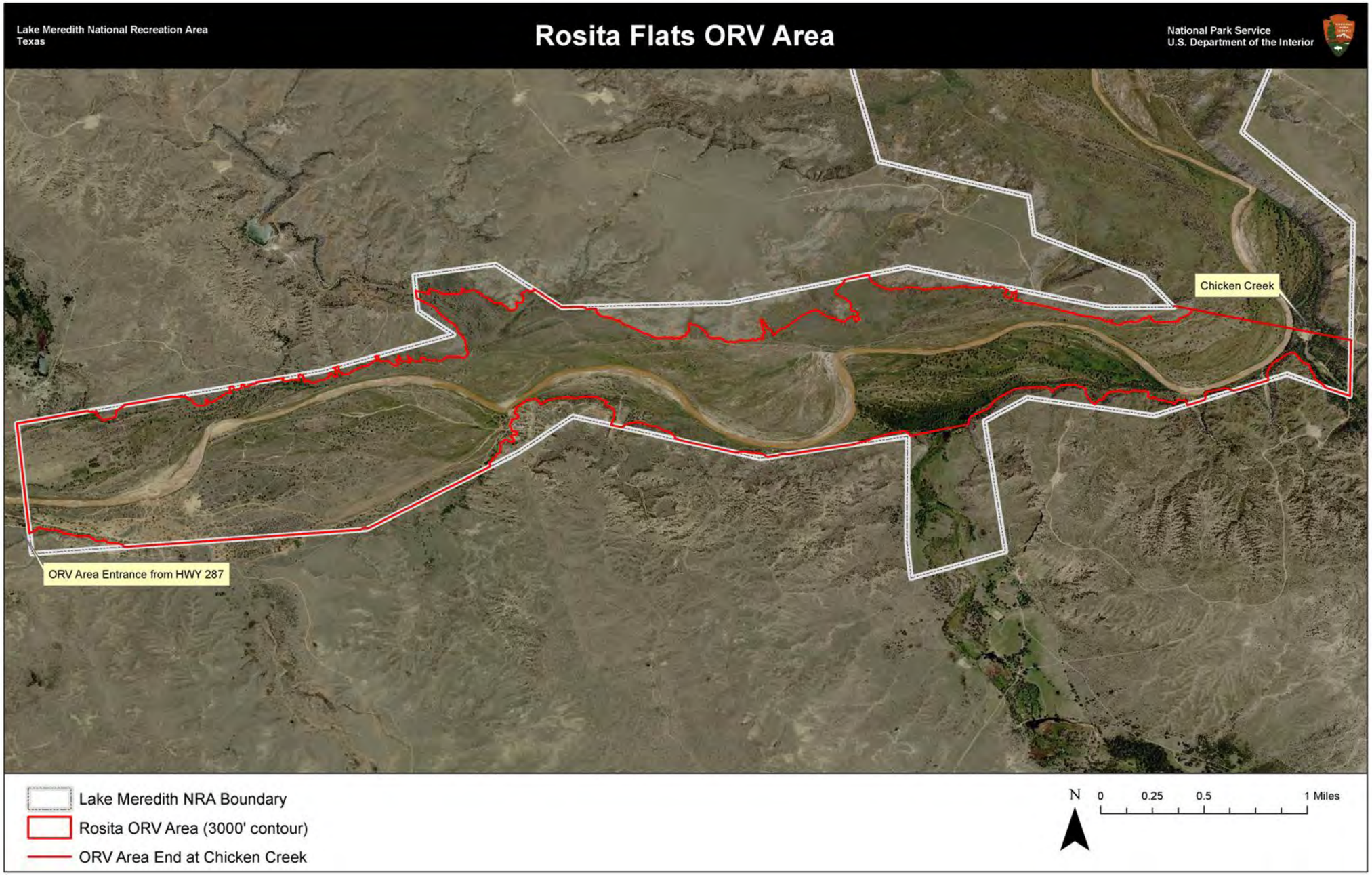

FIGURE 3: ROSITA FLATS OFF-ROAD VEHICLE AREA

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A park significance statement captures the essence of a park's importance to the nation's natural and cultural heritage. Understanding park significance helps managers make decisions that preserve the resources and values necessary to each park's purpose. The following significance statements recognize the important features of the national recreation area. As stated in the *Lake Meredith National Recreation Area Draft General Management Plan*, the national recreation area has the following significance (NPS n.d.c):

> Lake Meredith National Recreational Area is the largest area of public lands in the Texas panhandle, providing opportunities for access to diverse, affordable outdoor land- and water-based recreation activities.
>
> Lake Meredith and Canadian River basin in the recreation area provide aquatic, wetland, and riparian habitats, and one of the few areas in the region with trees. These habitats and the ecological transition zones between them and the surrounding landscape support diverse plant and animal species, including migratory waterfowl.
>
> The natural and geologic resources of the recreation area have enabled human survival, subsistence, and adaptation that have resulted in a continuum of human presence in the Texas panhandle for more than 13,000 years. Cultural sites in Lake Meredith National Recreation Area and the adjacent Alibates Flint Quarries National Monument offer views of lifeways in every cultural period that have been identified.
>
> The exposed geologic features of the Canadian River breaks in the recreation area reveal active geological processes that are easily visible to an extent not present elsewhere in the region. The topography and geography of the Canadian River breaks create a divergence from the surrounding landscape that offers scenic values and opportunities not found elsewhere in the region.

SUMMARY OF OFF-ROAD VEHICLE USE AND MANAGEMENT AT LAKE MEREDITH NATIONAL RECREATION AREA

In recent years, ORV management has become an issue of concern in many national park system units. Two areas of Lake Meredith National Recreation Area are currently designated as OHV areas (to avoid confusion, and for the purpose of this plan/EIS, the term "ORV" includes OHV areas): Rosita (also known as Rosita Flats), with approximately 1,740 acres for ORV use below the 3,000-foot elevation line, and Blue Creek, with 275 acres for ORV use. Rosita Flats is a riparian area of the Canadian River at the southern end of the national recreation area. The Blue Creek ORV use area is in the Blue Creek riparian area (which empties into Lake Meredith). Historically the local community used these two areas for recreational purposes prior to the establishment of the Sanford River Project in 1965 (NPS 2007a).

ORV Use in Lake Meredith National Recreation Area

Since the designation of Rosita Flats and Blue Creek as ORV use areas by special regulation 36 CFR 7.57, ORV use at the national recreation area has changed considerably, both in intensity and in the types

of vehicles used. Throughout the 1960s, the vehicles primarily consisted of a small number of "river buggies" crafted from old automobiles to operate in the Canadian River bottom (NPS 2007a). A few people used dirt bikes, motorcycles, or surplus military vehicles to access the area. The standard four-wheel-drive vehicles that are prevalent today were not as common and were rarely seen at the national recreation area. Regardless of the vehicle type, the majority of ORV use at the national recreation area has been for recreation, as opposed to transportation. Visitors from the vicinity and nearby urban areas use the ORV use areas, especially at Rosita Flats. Every February, an event called Sand Drags is held just outside the national recreation area to the north of Rosita Flats. This locally sponsored racing event draws approximately 30,000 visitors to the area, including hundreds of motorcycles, four-wheelers, sand rails (a type of dune buggy), and river buggies. Participants and spectators come from Texas, Oklahoma, New Mexico, Colorado, and California.

ORV use at Blue Creek is allowed only in the creek bottom along both sides from cutbank to cutbank. Cutbanks are defined by the national recreation area as the area at the base of the hills at the edges of the creek bed. Trails at Blue Creek generally stay within 0.5 mile of the creek. ORV use at Rosita is in the Canadian River bed as well as the surrounding hills, in some cases out to a mile or more. Although the authorized area at Rosita is below the 3,000-foot elevation line, and ORV use outside the authorized use areas is officially not allowed, it is difficult for ORV users to determine the exact location of the 3,000-foot elevation line.

Although maps of designated ORV use areas are made available on bulletin boards and provided to ORV groups, once visitors enter the Rosita Flats area or the Blue Creek area, ORV boundaries may not be clearly visible. Sporadic fencing exists at the 3,000-foot elevation line in parts of Rosita, but encroachment above the line still occurs. Likewise, ORV users may find staying within the cutbanks in the Blue Creek area difficult, as the cutbank demarcation may be ambiguous.

Regulations Bulletin Board at Blue Creek

As stated in the 2007 *Interim OHV Use Plan* (NPS 2007a), because of the length of time that ORV use has been occurring at the national recreation area, measuring the level of impacts on resources is difficult because most of the information and data about the areas have been collected since ORVs have been present.

SUMMARY OF RESEARCH ON OFF-ROAD VEHICLE USE

A literature review was prepared to support the development of the ORV management plan at Lake Meredith National Recreation Area, and is included as appendix A. The literature review summarizes the available information related to the potential effects of motorized vehicle use on natural and cultural resources, such as air and water quality, soils, vegetation, wildlife, and archeological resources. The literature review examines information on the effects of motorized vehicles on socioeconomics, aesthetics/sound, safety, and land management. Because the national recreation area is located in a semiarid region, the literature review focused on mountainous, semiarid, and desert environments, where appropriate.

The literature review was not intended to be all inclusive in covering ORV impact- and management-related studies, but it did incorporate the scientific literature used in developing the plan/EIS for the national recreation area. Some topics addressed in this review, such as air quality, can experience impacts from ORV use. However, they were not carried forward as impact topics for analysis in this plan/EIS because their impact level or frequency was not sufficient to warrant a full analysis. A list of impact topics addressed and those considered, but dismissed, is provided later in this chapter.

SCOPING PROCESS AND PUBLIC PARTICIPATION

As a result of this scoping effort, numerous issues were identified as requiring further analysis in this plan/EIS. These issues represent existing concerns as well as concerns that might arise during consideration and analysis of alternatives.

National Environmental Policy Act (NEPA) regulations require an "early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). To determine the scope of issues to be analyzed in depth in this plan/EIS, meetings were conducted with national recreation area staff, NPS personnel from the Environmental Quality Division, neighboring land management agencies, and other interested parties. The public was given the opportunity to learn about the planning process and to provide input during three public scoping meetings held in July 2008. The meetings were open-house-style sessions to allow the public to ask questions and provide input to the national recreation area staff in an informal atmosphere. The public had another opportunity to comment on the draft range of alternatives with a newsletter distributed and public meetings held in April 2010. As a result of this scoping effort, numerous issues were identified as requiring further analysis in this plan/EIS. These issues represent existing concerns as well as concerns that might arise during the consideration and analysis of alternatives. These issues and impact topics also take into account comments received on the draft plan/EIS. The comment period for the draft plan/EIS was open from January 25, 2013 through March 26, 2013. Two public meetings were held: one on March 19 in Amarillo, Texas, and the other on March 20 in Fritch, Texas. During the public comment period, 116 pieces of correspondence were received. Comments included suggestions about where ORV use should be allowed, suggestions for modifications to vehicle requirements, and a request for no changes in current management.

The issues identified during internal and public scoping are presented below. Chapter 5 includes additional information on the scoping and public involvement process and details about agency and public scoping activities that were an integral part of the planning process.

ISSUES AND IMPACT TOPICS

2008 Public Scoping Meeting

The national recreation area staff identified issues associated with implementing an ORV management plan at Lake Meredith National Recreation Area during the internal scoping meeting and the public identified issues during the public scoping process, including the three public meetings. The following text discusses these issues, which are the basis for the impact topics discussed in chapters 3 and 4.

SOILS

Impacts on soils from ORV use have occurred and continue to occur in the designated area of Rosita, particularly between the entrance and Bull Taco Hill. Extensive soil erosion has occurred over the last 40 years, primarily due to the use of ORVs above the 3,000-foot elevation line. On hillsides with slopes of 15 degrees or more, soils often erode during and after rainfall events because of the steep slopes and the removal of vegetation by ORV use.

View of Rosita Flats from Bull Taco Hill

The annual Sand Drags event held in February attracts over 30,000 spectators and hundreds of people racing motorcycles, four-wheelers, sand rails, and river buggies. Although it is held outside the national recreation area, there is a substantial increase in visitation associated with this event. The increased visitor and ORV traffic, and therefore the increased ORV-use intensity, have the potential to exacerbate the removal of vegetation and erosion. In addition, this event generally continues through rainstorms, and the potential for damage to geologic resources increases considerably with ORV use in wet conditions. The soils at the Blue Creek ORV use area remain in better condition than at Rosita Flats due to greater ranger presence and the rangers' ability to control ORV use and the associated impacts on hillsides and slopes. However, the potential for ORV use to impact geologic resources in the Blue Creek area remains, especially if such use increases or occurs outside designated routes or areas.

VEGETATION

Native vegetation is important for many reasons, including wildlife habitat and water quality protection. Use of ORVs in the Blue Creek and Rosita Flats areas has caused severe damage to plant communities, as documented in several planning documents and resource studies at Lake Meredith. At the Blue Creek ORV use area, ORV tracks parallel and cross Big Blue Creek several times, cutting through adjacent

vegetation. The damage in the Rosita Flats area is extensive, both in geographic area and in the types of effects on the natural communities (Nesom and O'Kennon 2005). Riparian area trees, including cottonwoods (*Populus deltoides*) and tall grasses, have also been impacted by having their roots exposed by ORV traffic. Invasive species are a potential threat to the native vegetation communities of the national recreation area. Thirty-seven nonnative species have been documented in the national recreation area, 10 of which have been classified as "highly invasive" and are displacing native species and 8 of which are classified as "invasive and potentially problematic." Examples of highly invasive species found at the national recreation area include saltcedar (*Tamarix ramosissima*), Russian thistle (*Salsola tragus*), and Mexican fireweed (*Bassia scoparia*). Invasive or noxious weeds present a potential threat to the ecosystems of national park units throughout the country and control or eradication of these species is often extremely difficult and expensive. Because ORVs have been found to spread the seeds of invasive species, this issue is addressed in the plan/EIS.

WATER RESOURCES

Lake Meredith National Recreation Area contains important water resources, including the surface of the lake and tributaries and groundwater in various aquifers beneath the national recreation area. The primary drainage in and out of the lake is the Canadian River, much of which flows underground. For drinking water supply, Lake Meredith water is blended with wellfield water from the Ogallala aquifer. Almost 100 miles of streams, fed primarily by springs, feed into the national recreation area (NPS 2007b). The Blue Creek and Rosita Flats ORV use areas contain water features including rivers and streams. Current management allows the operation of vehicles within and adjacent to portions of Big Blue Creek, the Canadian River, and Bonita Creek. ORV use in riparian areas could impact water quality because of increased soil erosion, vehicle fluid leakage, and discarded trash, which could result in pollutants entering surface or groundwater resources.

View of the Canadian River Bed at Rosita Flats

SOUNDSCAPES AND THE ACOUSTIC ENVIRONMENT

Impacts related to soundscapes could occur where ORVs are allowed in Rosita Flats or Blue Creek. A wide variety of ORV use occurs at the national recreation area (trucks, ORVs, utility terrain vehicles (UTVs), dune buggies, rock climbers, etc.), each omitting various levels of noise. Vehicular noise has the potential to impact other users in these areas, such as those camping, enjoying picnics with their families, or participating in other activities. ORV noise could also discourage wildlife from using these areas.

WILDLIFE AND WILDLIFE HABITAT

Lake Meredith National Recreation Area provides important habitat for wildlife in the region, especially water-dependent species. Reservoirs, playa lakes, and the river systems are used as important stopover points for birds during migration. The following species are believed to be native to the national recreation area: 60 mammals, 32 reptiles, 11 amphibians, and over 200 birds (NPS 1998b). A 2002–2003 survey recorded the presence of 18 fish, 9 amphibian, 27 reptile, 72 breeding bird, and 32 mammal species at the national recreation area and Alibates Flint Quarries, including native and nonnative (exotic) species (Patrikeev 2004). Common mammals known to occur in and around the national recreation area include mule deer, white-tailed deer, coyotes, porcupines, raccoons, skunks, ground squirrels, rabbits, pocket gophers, moles, a few bat species, and several varieties of rats and mice. Pronghorn antelope may occasionally stray into the area, but are primarily found in the flatter topography in upland prairies away from the Canadian River. Prominent birdlife consists of wild turkeys, northern bobwhites, scaled quail, mourning doves, greater roadrunners, and red-winged blackbirds. The national recreation area lies along the Central Flyway, which is a major north–south bird migration route located between the arid region to the west and the moister landscapes to the east. Large numbers of ducks, geese, and other migratory birds come to use open water areas as well as wetland areas during the fall through spring months. Turtles, lizards, frogs, and snakes, including two poisonous species (prairie rattlesnake and western diamondback rattlesnake), can be found in the national recreation area (NPS 2006a).

Deer and turkeys in the national recreation area have become accustomed to the crowds and noise associated with the Rosita and Blue Creek ORV use areas. Generally, neither area supports other wildlife. However, because the Rosita and Blue Creek areas can be the only source of drinking water for wildlife in times of drought, ORV use during drought could adversely impact wildlife. Extensive ORV use at the national recreation area has resulted in the loss of a considerable amount of ground vegetation, which is important to support native wildlife such as birds, deer, and mice. ORV use also has the potential to cause impacts on wildlife as a result of vehicle noise, which contributes to species disturbance or displacement, and habitat damage caused by vehicle use outside permitted areas and within the riverbed in the Rosita ORV use area.

THREATENED AND ENDANGERED SPECIES / SPECIES OF CONCERN

Habitat for federally threatened and endangered species, such as the Arkansas River shiner, may be vulnerable to disturbances caused by recreational uses, including ORV use. The Arkansas River shiner, listed as federally threatened by the U.S. Fish and Wildlife Service (USFWS), is currently the only listed species or species of concern known to inhabit Lake Meredith National Recreation Area. Within the national recreation area, the Arkansas River shiner is present in the Canadian River from Chicken Creek upstream to the U.S. Highway 287 bridge, which includes the Rosita ORV use area. Successful reproduction of this species appears to be strongly correlated with streamflow, where Arkansas River shiners are likely to spawn in the upper to mid-water column during elevated flows (70 FR 59825–59826; USFWS 2005a). In the absence of sufficient streamflows, their eggs would likely settle to the channel bottom and be smothered (70 FR 59825–59826). According to the USFWS, the Arkansas River shiner needs more than 130 miles of unimpounded, flowing water to successfully complete its reproductive cycle (USFWS 2005d).

Within the last few decades, the Arkansas River shiner has disappeared from over 80 percent of its historical range and is almost entirely restricted to approximately 508 miles (820 kilometers) of the Canadian River (69 FR 59861). Their decline is primarily the result of modification of the duration and timing of streamflows, habitat loss by inundation, stream depletion due to water diversion and groundwater pumping, water quality degradation, competition with invasive nonnative species, and the construction of impoundments (70 FR 59828; USFWS 2009). Within the national recreation area, it is

common for rivers and streams to dry up, leaving fish congregated in small to large puddles. ORVs ridden through the puddles pose a threat to the congregated fish species, including the Arkansas River shiner (Wimer 2010a).

Current and possible future management alternatives for ORV use and other recreational uses would take into consideration the needs of federally listed threatened and endangered species, as well as species of concern, in determining management measures.

ARCHEOLOGICAL RESOURCES

Due to its use as a major trade route, the Canadian River and its tributaries were a major focal point for prehistoric and historic activities, as demonstrated by a high density of sites located on the uplands, side drainages, and tributary drainages of the river (NPS 2002a). Archeological surveys conducted in the Rosita Flats area as part of a plan for prescribed burns in 2005 identified six archeological sites (4G Consulting 2005). ORV use has the potential to expose and disturb archeological sites through the erosion that can result from tire ruts and other ORV use. Because of known archeological sites in the Rosita Flats area and the potential for unknown sites in this area and in Blue Creek, impacts on archeological resources are analyzed in this plan/EIS.

VISITOR USE AND EXPERIENCE / HEALTH AND SAFETY

ORV use has taken place at Rosita and Blue Creek since at least the 1950s and today this area is still popular with ORV enthusiasts. Because ORV use at the national recreation area is an integral component of the experience for some visitors, visitors may be affected by potential ORV management actions, especially if certain restrictions or user fees are involved. Other popular visitor activities at the national recreation area include camping, picnicking, swimming, hunting, fishing from the shore, boating, and visiting archeological sites (Arizona State University [ASU] 2004). Visitors who do not use ORVs may also be impacted by ORV use, either through visitor conflicts or aesthetic/visitor experience issues. While there are no documented conflicts between ORV users, campers, fishermen, boaters, bird-watchers, and others (NPS 2007a), some public comments gathered through the public scoping process indicate visitors are concerned for their safety in ORV use areas, particularly due to speeding vehicles, reckless driving, and crime.

Visitor and ORV Users in Lake Meredith National Recreation Area

LAKE MEREDITH NATIONAL RECREATION AREA MANAGEMENT AND OPERATIONS

The NPS manages natural and cultural resources, public recreation, and associated facilities in the national recreation area. The superintendent has overall authority and uses five divisions for managing the park unit: (1) resource management, (2) law enforcement and visitor protection, (3) facility management, (4) administration, and (5) interpretation. In addition to numerous other responsibilities, national

recreation area staff members are charged with enforcing closures, monitoring motorized vehicle use for general violations, and providing interpretive and educational information to visitors. The implementation of additional management measures or regulations associated with this plan/EIS has the potential to impact the day-to-day operations and management of Lake Meredith National Recreation Area.

ISSUES CONSIDERED BUT DISMISSED FROM FURTHER CONSIDERATION

The following issues and impact topics were dismissed from further analysis:

Geohazards—No known geohazards in the national recreation area would be affected by the implementation of an ORV management plan; therefore, this topic was not carried forward for analysis in this plan/EIS.

Floodplains—While the entire area of Rosita Flats is a designated floodplain, no actions are being proposed that would involve the building of structures in the floodplain or that would otherwise alter the floodplain; therefore, this topic was not carried forward for analysis in this plan/EIS.

Prime Farmlands—No designated prime farmland soils exist in the national recreation area that would be affected by an ORV management plan; therefore, this topic was not carried forward for analysis in this plan/EIS.

Museum Collections—No museum collections that would be affected by an ORV management plan exist in the national recreation area; therefore, this topic was not carried forward for analysis in this plan/EIS.

Paleontology—While paleontological resources have been found in other areas of the national recreation area, formations present in the Rosita and Blue Creek areas are unlikely to contain these resources. Therefore, this resource topic was not carried forward for analysis in this plan/EIS.

Energy Resources—This topic involves assessing energy requirements and the potential for energy conservation associated with the various alternatives, but is most relevant to facility construction projects. The national recreation area would continue to operate under the wise energy use guidelines and requirements stated in the NPS *Management Policies 2006*, Executive Order 13123 (“Greening the Government through Effective Energy Management”), Executive Order 13031 (“Federal Alternative-fueled Vehicle Leadership”), Executive Order 13149 (“Greening the Government through Federal Fleet and Transportation Efficiency”), and the 1993 NPS *Guiding Principles of Sustainable Design*.

Socioeconomics—The social and economic environment of a region is characterized by its demographic composition, the structure and size of its economy, and the types and levels of public services available to its citizens. The national recreation area provides recreation, quality of life, and other amenities to regional visitors and residents. The NPS evaluated the socioeconomic environment in the three counties surrounding Lake Meredith in the center of the Texas panhandle. The national recreation area boundaries extend into Hutchinson County, Moore County, and Potter County. These three counties form the economic region of influence (ROI) and define the geographic area in which the predominant social and economic impacts from the proposed alternatives are likely to take place.

Although the national recreation area contributes to the local economy, analysis suggests that the proposed alternatives for managing ORV use would have a long-term negligible adverse impact on the overall economy within the ROI. The majority of visitors to the national recreation area live in the ROI or the state of Texas (ASU 2004). Based on the experience of national recreation area staff and a survey of

local businesses, visitor spending in the ROI is low. Close proximity allows most visitors to take day trips to the national recreation area rather than spending the night. There are few hotels in the immediate vicinity of the national recreation area, and most people who spend the night camp within the national recreation area boundaries. Furthermore, only around 10 to 15 percent of national recreation area visitors participate in the activities that would potentially be affected by the alternatives, including four-wheel driving, motorized trail biking, and ATV riding (ASU 2004). The small share of the overall visitation affected by changes in ORV regulations combined with the low level of spending suggests that any impact on the local economy would be long term, negligible, and adverse as well.

To support this assessment, a regional economic impact model, IMPLAN (Minnesota IMPLAN Group [MIG] 2008), was used to assess the quantitative impacts that the proposed alternatives may have on the local economy. An annual baseline spending level was generated using the daily visitor spending assumptions and average annual national recreation area visitation statistics from *Economic Benefits to Local Communities from National Park Visitation and Payroll, 2009* (NPS 2011b). Potential decreases in visitation to the national recreation area resulting from implementing any of the alternatives are manifested in the model through decreases in spending in the local economy. Several possible visitation scenarios that could follow the implementation of the rule were used to account for a range of possible impacts on the local economy. Extreme changes in visitation were used to illustrate the worst-case outcomes for the overall impact on the economy. These scenarios are unlikely to result from any of the alternatives and should overstate any impact of new national recreation area regulations. Results from the IMPLAN model showed that the impact on regional economic output and employment would be negligible under any of the scenarios evaluated. Even with the drop in spending associated with the 50 percent decrease in visitation, the effects on the region's economic output and employment would be minimal.

Although the impact on the overall economy would be negligible, the impact on individual businesses may vary, and a few businesses may bear the majority of any potential impact from any of the alternatives. To assess the possible impacts of the proposed alternatives on businesses that serve visitors, RTI International conducted a small-scale business survey around the national recreation area. The survey focused on three primary businesses and one secondary business that are most likely to be directly affected by any change in national recreation area ORV regulations. All of the businesses are involved in selling and servicing equipment and parts for outdoor recreation (ATVs, motorized bicycles, recreational vehicles, etc.). They are all located in Amarillo, Texas. Overall, two of the four businesses felt that the alternatives would have a significant impact on their customers and, subsequently, their businesses.

The IMPLAN analysis and small business survey support the decision to dismiss further socioeconomic evaluation of the alternatives. Because the ROI does not rely on tourism to sustain its economy, even the unlikely event of a 50 percent decrease in visitation to the national recreation area would have a long-term negligible adverse impact on the overall economy; therefore, the topic of socioeconomics was not carried forward for analysis in this plan/EIS.

Minority and Low Income Populations—Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, states "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." Executive Order 12898 defines a minority as any person who identifies himself/herself as being of a race other than non-Hispanic White alone. A minority population is defined as either, "(a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." (CEQ 1997). For purposes of this analysis, the threshold to determine high concentrations of

minority residents is when the area under analysis comprises minority populations more than 10 percent greater than the benchmark or reference region. In this case, the reference or benchmark geographic area is Texas. As shown in table 1, all counties in the ROI are less than 10 percentage points greater than the Texas average. Therefore, the ROI is not classified as an area with high concentrations of minority residents.

Guidance from the U.S. Census classifies a poverty area as an area where 20 percent or more of the population lives below the poverty line. As demonstrated in table 1, two of the three counties in the ROI have populations with less than 20 percent of residents living below the poverty line. In Potter County, approximately 23 percent of the population lives below the poverty line. The proposed action alternatives would regulate ORV use in different areas throughout the national recreation area. Locations where ORV use is allowed may change, although ORV use would largely still be permitted in the national recreation area. Because any change in ORV use regulations would affect all users in the same manner, no disproportionate adverse impacts to low-income populations are anticipated. The proposed action alternatives introduce an annual permit fee for using ORVs within the national recreation area. This fee would apply to all visitors who access the national recreation area with personal ORVs, and would represent a small fraction of the cost associated with purchasing and maintaining these vehicles. Therefore, it is not anticipated that permit fees introduced as part of the proposed action alternatives would result in disproportionate adverse impacts to low-income populations in Potter County and the larger ROI.

TABLE 1: ENVIRONMENTAL JUSTICE STATISTICS, 2010

Geographic Area	Percentage of Population	
	Minority	Below the Poverty Level
United States	36%	14%
Texas	55%	17%
Hutchinson County[a]	26%	15%
Borger Urban Cluster	26%	13%
Moore County	62%	13%
Potter County	51%	23%
ROI[b]	49%	20%

Source: U.S. Census Bureau, 2010.

[a] Includes Borger urban cluster.

[b] Per capita income was calculated as an average of the three counties; minority, poverty, and graduation statistics were calculated from actual population figures.

Urban/Gateway Communities—A gateway community is defined by the NPS *Management Policies 2006* as a community that exists in close proximity to a unit of the national park system whose residents and elected officials are often affected by the decisions made in the course of managing the park unit. Because of this, there are shared interests and concerns regarding decisions. Gateway communities usually offer food, lodging, and other services to park visitors. They also provide opportunities for employee housing and a convenient location to purchase goods and services essential to park administration. Although communities adjacent to the national recreation area would fall under this definition, as noted above under the dismissal for socioeconomics, impacts would not be greater than long term, negligible, and adverse. Therefore, this impact topic was not carried forward for analysis.

Air Quality—Air quality in the Texas panhandle is relatively good, due mostly to the constant breezes that blow year-round and seldom allow stagnant air to remain in the area. Since the establishment of Lake Meredith National Recreation Area, air quality is better than in the 1950s when three carbon black plants operated near the town of Sanford, which is near the northern boundary of the national recreation area (NPS 1996). Currently, the national recreation area is in attainment for all U.S. Environmental Protection Agency (EPA)-designated criteria pollutants (Texas Commission on Environmental Quality [TCEQ] 2009). However, due to the potential for site-specific, short-term impacts on visitor experience from vehicle emissions and dust, these topic elements are discussed in the "Visitor Use and Experience" section.

Cultural Landscapes—Cultural landscapes have not been identified in Lake Meredith National Recreation Area; therefore, this topic was not carried forward for analysis in this plan/EIS.

Unique or Important Wildlife and Habitat—No unique wildlife or wildlife habitats exist in Lake Meredith National Recreation Area; therefore, this impact topic was not carried forward for analysis in this plan/EIS.

Prehistoric and Historic Structures—No known prehistoric or historic structures exist in Lake Meredith National Recreation Area; thus, none would be impacted by the implementation of this plan/EIS and this topic was not carried forward for analysis in the plan/EIS.

RELEVANT LAWS, POLICIES, REGULATIONS, AND PLANS

FEDERAL LAWS, POLICIES, REGULATIONS, AND PLANS DIRECTLY RELATED TO OFF-ROAD VEHICLE MANAGEMENT

Executive Order 11644: Use of Off-road Vehicles on the Public Lands

On February 8, 1972, President Richard Nixon issued Executive Order 11644 to "establish policies and provide for procedures that will ensure the use of ORVs on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands."

The executive order directs agencies to develop and issue regulations and administrative instructions to designate the specific areas and trails on public lands on which ORV use may and may not be permitted. According to this executive order, the location of ORV-permitted use areas and trails shall

- Minimize damage to soil, watershed, vegetation, or other resources of the public lands;
- Minimize harassment of wildlife or significant disruption of wildlife habitats;
- Minimize conflicts between ORV use and other existing or proposed recreational uses of the same on neighboring public lands, and ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors; and
- Areas and trails shall not be located in officially designated wilderness areas or primitive areas but shall be located in areas of the national park system, natural areas, or national wildlife refuges and game ranges only if the respective agency head determines that ORV use in such locations will not adversely affect their natural, esthetic, or scenic values.

Executive Order 11989: Off-road Vehicles on Public Lands

This executive order, issued on May 24, 1977, by President Jimmy Carter, directs agencies to immediately close off-road areas or trails when it is determined that ORV use causes or will cause considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources to the type of ORV causing such effects, until such time as determined that such adverse effects have been eliminated and measures have been implemented to prevent future recurrence. The executive order also includes the authority to preclude ORV use in portions of the public lands under an agency's jurisdiction, except those areas or trails that are suitable and specifically designated as open to such use.

Code of Federal Regulations, Title 36, Section 4.10: Travel on Park Roads and Designated Routes

This CFR section states, "operating a motor vehicle is prohibited except on park roads, in parking areas and on routes and areas designated for off-road motor vehicle use." Additionally, routes and areas designated for ORV use shall be promulgated as special regulations, with designations complying with Executive Order 11644. Lake Meredith National Recreation Area will be in compliance with this regulation as a result of the plan/EIS and special regulation.

OTHER APPLICABLE FEDERAL LAWS, POLICIES, REGULATIONS, AND PLANS

The plan/EIS must conform to the federal laws, policies, regulations, and plans described in this section. Although some of the following documents may not be directly related to ORV management, they are relevant to issues at the national recreation area that may be indirectly influenced by or associated with ORV use.

Code of Federal Regulations, Title 36 (1992)

Title 36, Chapter 1, provides the regulations "for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service." It states, "the National Park Service has the authority to manage the wildlife in the parks in fulfillment of the Organic Act without the consent of the state and by methods contrary to state law" (16 USC 3).

Code of Federal Regulations, Title 43

Title 43 of the CFR, Part 24, describes the four major systems of federal lands administered by the U.S. Department of the Interior. Section 24.4(f) states that "Units of the National Park System contain natural, recreation, historic, and cultural values of national significance as designated by Executive and Congressional action." In describing appropriate activities, it states, "as a general rule, consumptive resource utilization is prohibited." In addition, Section 24.4(i) instructs all federal agencies of the Department of the Interior, among other things, to "prepare fish and wildlife management plans in cooperation with State fish and wildlife agencies and other Federal (non-Interior) agencies where appropriate." It also directs agencies to "consult with the States and comply with State permit requirements… except in instances where the Secretary of the Interior determines that such compliance would prevent him from carrying out his statutory responsibilities."

Endangered Species Act of 1973, as Amended

This act requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals with the potential to impact federally endangered or threatened plants and animals. It also

requires federal agencies to use their authorities in furtherance of the purposes of the Endangered Species Act (ESA) by carrying out programs for the conservation of endangered and threatened species. Federal agencies are also responsible for ensuring that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat.

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under this act it is prohibited, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention…for the protection of migratory birds…or any part, nest, or egg of any such bird" (16 USC 703). Subject to limitations in the act, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest, or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits, and migratory flight patterns.

Federal Noxious Weed Act of 1975

The Federal Noxious Weed Act (7 USC 2801–2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of nonnative weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Because the potential exists for seeds of nonnative and potentially invasive or noxious plants to be introduced or spread by motorized vehicle use at the national recreation area, this act was considered in developing potential ORV management actions.

National Environmental Policy Act of 1969, as Amended

The NEPA is implemented through regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500–1508). The NPS has in turn adopted procedures to comply with the act and CEQ regulations, as found in Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2011a), and its accompanying handbook (NPS 2001). Section 102(2)(c) of NEPA requires that an environmental impact statement (EIS) be prepared for proposed major federal actions that may significantly affect the quality of the human environment.

National Historic Preservation Act of 1966, as Amended

Section 106 of this act requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places (national register). All actions affecting the national recreation area's cultural resources must comply with this legislation.

National Parks Omnibus Management Act of 1998

Both the National Parks Omnibus Management Act of 1998 (16 USC 5901 et seq.) (NPOMA) and NEPA are fundamental to NPS park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts using appropriate

technical and scientific information. Both also recognize that such data may not be readily available and provide options for resource impact analysis in this case.

The NPOMA directs the NPS to obtain scientific and technical information for analysis. The NPS handbook for Director's Order 12 states that if "such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision will be modified to eliminate the action causing the unknown or uncertain impact or other alternatives will be selected" (NPS 2011a).

NPS Organic Act of 1916

By enacting the NPS Organic Act of 1916, Congress directed the U.S. Department of the Interior and NPS to manage units of the national park system "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 USC 1). The Redwood National Park Expansion Act of 1978 reiterates this mandate by stating that the NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1 a-1).

Despite these mandates, the Organic Act and its amendments afford the NPS latitude when making resource decisions that balance visitor recreation and resource preservation. By these acts Congress "empowered [the NPS] with the authority to determine what uses of park resources are proper and what proportion of the park's resources are available for each use" (*Bicycle Trails Council of Marin v. Babbitt*, 82 F.3d 1445, 1453 [9th Cir. 1996]).

Yet courts consistently interpret the Organic Act and its amendments to elevate resource conservation above visitor recreation. *Michigan United Conservation Clubs v. Lujan*, 949 F.2d 202, 206 (6th Cir. 1991), states: "Congress placed specific emphasis on conservation." The court in *National Rifle Association of America v. Potter* states, "in the Organic Act Congress speaks of but a single purpose, namely, conservation." The NPS *Management Policies 2006* also recognizes that resource conservation takes precedence over visitor recreation. The policy dictates, "when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant" (NPS 2006b, sec. 1.4.3).

Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. Yet, the NPS has discretion to allow negative impacts when necessary (NPS 2006b, sec. 1.4.3). While some actions and activities cause impacts, the NPS cannot allow an adverse impact that constitutes resource impairment (NPS 2006b, sec. 1.4.3). Specifically, NPS *Management Policies 2006*, Section 1.4.3.1 states, "In the administration of authorized uses, park managers have the discretionary authority to allow and manage the use, provided that the use will not cause impairment or unacceptable impacts." The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the action (16 USC 1a-1). An action constitutes "an impairment" when its impacts would "harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values" (NPS 2006b, sec. 1.4.5). To determine impairment, the NPS must evaluate "the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts" (NPS 2006b, sec. 1.4.5).

Park managers must also not allow uses that would cause unacceptable impacts (NPS 2006b, sec. 1.4.7). These are impacts that fall short of impairment, but are still not acceptable in a particular park's

environment. For the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- Be inconsistent with a park's purposes or values, or
- Impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- Create an unsafe or unhealthful environment for visitors or employees, or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- Unreasonably interfere with:
  - Park programs or activities, or
  - An appropriate use, or
  - The atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park, or
  - NPS concessioner or contractor operations or services.

Because park units vary based on their enabling legislation, natural resources, cultural resources, and missions, management activities appropriate for each unit and for areas in each unit vary as well. An action appropriate in one unit could impair or cause unacceptable impacts on resources in another unit. Thus, this plan/EIS analyzes the context, duration, and intensity of impacts related to the implementation of an ORV management plan at Lake Meredith National Recreation Area, as well as the potential for resource impairment or unacceptable impacts, as required by Director's Order 12: *Conservation Planning, Environmental Impact Analysis and Decision-making* (NPS 2011a).

Redwood National Park Act of 1978, as Amended

Reasserting the system-wide standard of protection established by Congress in the original Organic Act, the Redwood Amendment stated:

> The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress (P.L. 95-250, USC Sec 1a-1).

Congress intended the language of the Redwood Amendment to the General Authorities Act to reiterate the provisions of the Organic Act, not to create a substantively different management standard. The House committee report described the Redwood Amendment as a "declaration by Congress" that the promotion and regulation of the national park system is to be consistent with the Organic Act. The Senate committee report stated that under the Redwood Amendment, "The Secretary has an absolute duty, which is not to be compromised, to fulfill the mandate of the 1916 act to take whatever actions and seek whatever relief as will safeguard the units of the national park system." Although the Organic Act and the General Authorities Act, as amended by the Redwood Amendment, use different wording ("unimpaired" and "derogation") to describe what the NPS must avoid, both acts define a single standard for the management of the national park system—not two different standards. For simplicity, NPS *Management Policies 2006* uses "impairment," not both statutory phrases, to refer to that single standard.

Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds

Migratory birds are of ecological and economic value to this and other countries. They contribute to biological diversity and bring tremendous enjoyment to millions of people who study, watch, feed, or hunt these birds throughout the United States and other countries. The United States has recognized the critical importance of this shared resource by ratifying international, bilateral conventions for the conservation of migratory birds, including the Convention for the Protection of Migratory Birds with Great Britain on behalf of Canada 1916, the Convention for the Protection of Migratory Birds and Game Mammals–Mexico 1936, the Convention for the Protection of Birds and Their Environment–Japan 1972, and the Convention for the Conservation of Migratory Birds and Their Environment–Union of Soviet Socialist Republics 1978. These migratory bird conventions impose substantive obligations on the United States for the conservation of migratory birds and their habitats, and through the Migratory Bird Treaty Act, the United States has implemented these migratory bird conventions with respect to the United States. This executive order directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act.

Executive Order 11990: Protection of Wetlands

This executive order directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Executive Order 11988: Floodplain Management

This executive order directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

Executive Order 13112: Invasive Species

The use of motorized vehicles has the potential to introduce or spread the seeds of nonnative plants at the national recreation area. This executive order requires the NPS to prevent the introduction of invasive species, provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause.

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations

This executive order focuses federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The executive order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment. The presidential memorandum accompanying the order underscores certain provisions of existing law to help ensure that all communities and people across the nation live in a safe and healthful environment.

NPS *Management Policies 2006*

NPS *Management Policies 2006* addresses management of ORVs in Section 8.2.3.1, Off-Road Vehicle Use. This section (NPS 2006b) states:

> Off-road motor vehicle use in national park units is governed by Executive Order 11644 (Use of Off-road Vehicles on the Public Lands, as amended by Executive Order 11989), which defines off-road vehicles as "any motorized vehicle designed for or capable of cross-country travel on or immediately over, land, water, sand, snow, ice, marsh, swampland, or other natural terrain" (except any registered motorboat or any vehicle used for emergency purposes). Unless otherwise provided by statute, any time there is a proposal to allow a motor vehicle meeting this description to be used in a park, the provisions of the executive order must be applied.
>
> In accordance with 36 CFR 4.10(b), routes and areas may be designated only in national recreation areas, national seashores, national lakeshores, and national preserves, and only by special regulation. In accordance with the executive order, they may be allowed only in locations where there will be no adverse impacts on the area's natural, cultural, scenic, and esthetic values, and in consideration of other existing or proposed recreational uses. The criteria for new uses, appropriate uses, and unacceptable impacts listed in sections 8.1 and 8.2 must also be applied to determine whether off-road vehicle use may be allowed. As required by the executive order and the Organic Act, superintendents must immediately close a designated off-road vehicle route whenever the use is causing or will cause unacceptable impacts on the soil, vegetation, wildlife, wildlife habitat, or cultural and historic resources.
>
> NPS administrative off-road motor vehicle use will be limited to what is necessary to manage the public use of designated off-road vehicle routes and areas; to conduct emergency operations; and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means. (NPS 2006b, Section 8.2.3.1)

Management policies relating to resource protection also were considered in developing this plan/EIS. For example, NPS *Management Policies 2006* instructs park units to maintain, as parts of the natural ecosystems of parks, all plants and animals native to the park ecosystems, in part by "minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them" (NPS 2006a, Section 4.4.1).

Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision-making and Handbook

NPS Director's Order 12 (NPS 2011a) and its accompanying handbook (NPS 2001) lay the groundwork for how the NPS complies with NEPA. Director's Order 12 and handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects.

Director's Order 12 requires that impacts on park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision makers to understand the implications of those impacts in the short and long term, cumulatively, and in context, based on a review and analysis of potential impacts by resource professionals and specialists. Director's Order 12 also requires that an analysis of impairment of park resources and values be made as part of the NEPA document.

Director's Order 28: Cultural Resource Management

This director's order sets forth the guidelines for management of cultural resources, including cultural landscapes, archeological resources, historic and prehistoric structures, museum objects, and ethnographic resources (NPS 1998a). This order calls for the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principals contained in NPS *Management Policies 2006*.

Director's Order 77: Natural Resource Protection

Director's Order 77 addresses natural resource protection, with specific guidance provided in Reference Manual 77: *Natural Resource Management* (NPS n.d.b), which offers comprehensive guidance to NPS employees responsible for managing, conserving, and protecting the natural resources found in national park system units. The manual serves as the primary guidance on natural resource management in units of the national park system. Reference manual chapters that are particularly relevant to this plan/EIS include air resources management; endangered, threatened, and rare species management; geologic resources management; native animal management; shoreline management; vegetation management; special use permitting; wetland protection (Director's Order 77-1 [NPS 2002b]); and floodplain management (Director's Order 77-2 [NPS 2003]).

Relationship to Other Lake Meredith National Recreation Area Planning Documents, Policies, and Actions

The following plans, policies, and actions occurring at the national recreation area were considered during the development of this plan/EIS.

Resources Management Plan: Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument (1996)

This resources management plan provides goals for the national recreation area that address preserving national recreation area resources, providing for the public enjoyment and visitor experience, perpetuating cultural resources and enhancing recreational opportunities managed by partners, and ensuring organizational effectiveness. Specifically related to ORV use in the national recreation area, the resources management plan states that severe damage to soils and vegetation and resultant erosion have occurred in Rosita and Blue Creek as a result of continued ORV use. Damage to a lesser extent has occurred in other portions of the national recreation area due to illegal ORV use outside these designated ORV use areas. Furthermore, several archeological sites have been damaged both inside and outside the ORV use areas. Noise pollution from ORV use has also been a problem (NPS 1996). These resource conditions are identified and addressed in this plan.

Specifically related to ORV use in the national recreation area, the resources management plan states that severe damage to soils and vegetation and resultant erosion have occurred in Rosita and Blue Creek as a result of continued ORV use.

Alibates Flint Quarries National Monument / Lake Meredith National Recreation Area Strategic Plan FY-2008 through FY-2012

This strategic plan (NPS n.d.a) was written to fulfill the requirements of Section 104 of NPOMA. This legislation requires all field units of the national park system prepare strategic plans and annual performance plans consistent with the Government Performance and Results Act of 1993 and make these

documents available to the public. This plan contains long-term goals, which target in quantifiable, measurable ways what the national recreation area staff will accomplish during the planning period toward achieving the overall mission goals. The long-term goals in the plan address appropriate "Service-wide" goals as well as park-specific outcomes. The strategic plan includes information on how these goals will be accomplished, including staffing, fiscal, infrastructure, and other resources available to achieve the plan's long-term goals. Goals stated under the strategic plan that relate to ORV use in the national recreation area include the following:

- By September 30, 2012, 85 percent of visitors to Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are satisfied with appropriate park facilities, services, and recreational opportunities.
- By September 30, 2012, Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument will have or maintain 24 community partnerships designed to enhance the park's ability to manage recreation activities seamlessly.

Interim Off-Highway Vehicle Plan

This management plan (NPS 2007a, in conjunction with the *Superintendent's Compendium*) provides guidelines for ORV use on an interim basis until this plan/EIS is completed and a federal rule is adopted, pursuant to the requirements of Executive Order 11644 as amended. It provides a history of ORV use in the national recreation area, summarizes the issues of concern associated with ORV use, and recommends potential management actions for future planning efforts, stating that the national recreation area supports the continued use of ORVs at the national recreation area. This plan sets forth the issues of concern, but does not designate routes or areas, or park goals related to ORV use.

Superintendent's Compendium

Under the provisions of 16 USC, Section 3, and 36 CFR 1, the *Superintendent's Compendium* (compendium) designates closures, permit requirements, and other restrictions imposed under the discretionary authority of the superintendent for Lake Meredith National Recreation Area. Regulations listed in the compendium are a requirement in addition to those listed in parts 1–7 of Title 36, unless otherwise noted. In addition to the compendium regulations, written determinations that explain the reasoning behind the superintendent's use of discretionary authority are required by 36 CFR 1.5(c) and appear in the document as italicized print or are available for review in the Chief Ranger's Office. Regulations in the compendium that are related to ORV use define areas where ORVs may be used and provide the authority for area closures. These regulations include the following:

- Section 1.5: Areas in the park may be closed to public use for resource protection. These areas will be designated with fencing, barriers, and/or signs stating that a closure is in effect.
- Backcountry areas across the Canadian River at the Mullinaw Crossing are closed to access by motor vehicle(s) except during the park's general deer hunting season, as determined by the superintendent.
- Section 1.5 (a)(2): Blue Creek and Rosita are designated as ORV use areas, regulated by 36 CFR 7.57(1)(b).
- Section 4.21 – Speed Limits: This section sets a speed limit of 15 miles per hour (mph) in the Rosita area and 35 mph in the Blue Creek area.

The compendium also addresses hunting restrictions, an activity that is permitted in Blue Creek and Rosita areas. The compendium requires recreation fees for lake use (vessels) but not for ORV use.

Visitor Study Final Technical Report: Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument (2004)

Visitor Study Final Technical Report: Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument (ASU 2004) (visitor study) presents findings from a cooperative social science research project designed to inform the NPS general management planning efforts. Although recent data from the NPS Visitor Survey Card project was available, it proved to be insufficient because no specific data existed that would inform managers about visitors' responses to various alternative scenarios for the future (ASU 2004). Thus, this visitor study was implemented to meet those needs.

Data for the visitor study were collected from current and potential national recreation area visitors and residents of the communities adjacent to the national recreation area. The study draws on four sources of data: (1) on-site survey questionnaires of current adult national recreation area visitors, (2) mail survey questionnaires of current adult national recreation area visitors contacted on site, (3) mail survey questionnaires of current and potential national recreation area visitors who purchased annual watercraft permits in 2002 and 2003, and (4) focus group interviews with organized interest groups from nearby communities.

When visitors were asked to pick only one activity they participate in while at the national recreation area, approximately 11.5 percent of those surveyed by mail and on site chose ORV activities (four-wheel driving, motorized trail bike/dirt biking, dune buggy, or ATV riding) (ASU 2004). However, it is noted that a majority of the national recreation area visitors participate in multiple activities during their visit to the national recreation area. When allowed to choose multiple activities, most respondents chose picnicking and swimming above all other recreational activities.

Master Plan: Lake Meredith National Recreation Area (1973)

The master plan for the national recreation area details the aspects of the national recreation area that make it unique, as well as providing a plan that facilitates access to land and water in the area. In regard to ORV use, the master plan identifies off-road vehicular travel, especially trail-biking, as an activity that occurs at the national recreation area. The development called for in the master plan focuses mainly around water-based uses, and not land-based uses, such as ORVs. This plan also calls for controlling various visitor uses as the need arises, noting that some areas should be designated for the consumptive use of ORVs.

General Management Plan for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument (Ongoing)

The draft GMP for Lake Meredith National Recreation Area was published and open for public comment in January 2013, with the final GMP awaiting approval. A key feature of the plan is to determine ways to expand visitor opportunities at the national recreation area in response to changing conditions at the park, such as the variability of the lake water level in recent years. The NPS is exploring methods to improve existing recreation and introduce new activities at the national recreation area. The NPS identified alternative 3 as the preferred alternative in the draft GMP. Under alternative 3, management of Lake Meredith National Recreation Area would promote both traditional and nontraditional uses, providing development of facilities and opportunities to address changing lake conditions and visitor uses. It would become a destination for semi-primitive outdoor recreation opportunities for a broad range of skill levels. The national recreation area would strengthen partnership opportunities that employ science-based resource management and compatible land management uses to improve visitor experience and wildlife habitat. This alternative further identifies Rosita Flats and Blue Creek as ORV use areas, with

management following this plan/EIS. Decisions from this plan/EIS process will be incorporated into the GMP as planning progresses.

RELATIONSHIP TO OTHER STATE AND LOCAL PLANNING DOCUMENTS, POLICIES, ACTIONS, LAWS, AND REGULATIONS

The following state and local documents, policies, actions, laws, and regulations are directly or indirectly related to ORV use and were therefore considered during the development of this plan/EIS.

Texas Wildlife Action Plan (2006)

The Texas Parks and Wildlife Department's (TPWD) *Texas Wildlife Action Plan* (the plan) is an outline for various strategies that will assist the TPWD with the development of nongame initiatives that address the needs of animal species not typically hunted. The plan is also a requirement for the State Wildlife Grant program, as outlined by the USFWS, which provides state grants to address unmet wildlife conservation needs. In addition to analyzing detailed species information, the plan also provides broad habitat information in various ecoregions of Texas.

The plan recognizes the High Plains ecoregion of Texas as a "secondary priority ecoregion" (TPWD 2006). The High Plains ecoregion encompasses the Texas panhandle, including the Lake Meredith National Recreation Area. The plan explains that this ecoregion is one of the least conserved in Texas, and that it has experienced a high rate of conversion to cropland. Threats to the region include fragmentation; damming of springs, streams, and rivers; and surface mining.

The plan also recognizes the Canadian River Basin in an analysis of various Texas river basins. The plan explains that threats to the Canadian River Basin include increased silt loads from erosion, which could affect the suitability of riverine habitat, invertebrate production, and fish survival. It also states that brush control could increase flow rates but may also lead to changes in streambank vegetation and erosion processes (TPWD 2006). While the plan does not identify ORV use as a contributing factor to resource damage in this ecoregion and river basin, ORV activities and management will likely have implications related to the various strategies outlined in this plan/EIS.

Land and Water Resources Conservation and Recreation Plan (2005)

This plan, written by the TPWD, seeks to guide the TPWD in conserving Texas' natural and historical heritage while providing for public access and recreation to the outdoors. It specifically addresses the conservation of land and water resources, as well as land and water recreation. The NPS requires each state's park agency to update a Statewide Comprehensive Outdoor Recreation Plan every five years to be eligible for land and water conservation funds. Eligibility for this program allows the TPWD to receive matching grants for land acquisition and construction of recreational facilities on state and local parks. The *Land and Water Resources Conservation and Recreation Plan* will serve as Texas' comprehensive plan to meet the NPS eligibility requirements (TPWD 2005). While ORV use is not specifically identified in any of the conservation and recreation priorities, the plan does recognize the damage ORVs can cause to streambeds and the potential for conflicts between ORV users and other public land users or adjacent landowners. One of the major goals of the plan is to increase the participation in and quality of hunting, fishing, boating, and outdoor recreation.

Texas Off-highway Vehicle Program

The TPWD has developed an OHV program (TPWD 2008) to encourage the responsible use of OHVs and to help OHV users locate places to ride safely and legally. The program is also designed to provide

funding to develop more OHV-friendly recreational areas. Under Texas State Law, an OHV decal is required for all individuals operating an OHV in Texas in an area that is on public land or on lands that have been purchased with TPWD OHV grants. The decal is valid for a one-year period. Decals currently cost $8.00 and revenue generated from decal sales is being used to create or improve existing OHV recreation areas in Texas. The program's website (http://www.tpwd.state.tx.us/spdest/ohv/index.phtml) provides information of where to buy OHV decals (including state offices and some OHV dealers), where to ride OHVs, information on responsible use, and other resources regarding safe and legal OHV operation. The State of Texas requires that all OHV users purchase and display the decal prior to operating the vehicle on public lands, including the national recreation area. Failure to obtain this decal constitutes a Class C misdemeanor and could result in a citation being issued to the OHV operator. Fines for this offense range from $25 to $500.

Alternatives

CHAPTER 2

CHAPTER 2: ALTERNATIVES

The NEPA requires federal agencies to explore a range of reasonable alternatives that address the purpose of and need for the action. The alternatives under consideration must include the "no-action" alternative as prescribed by 40 CFR 1502.14. Action alternatives may originate from the proponent agency, local government officials, or members of the public at public meetings or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies.

Action alternatives may originate from the proponent agency, local government officials, or members of the public at public meetings or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies.

The alternatives analyzed in this document, in accordance with NEPA, are the result of internal and public scoping as well as public comment on the draft plan/EIS. These alternatives meet the management objectives of the national recreation area while also meeting the overall purpose of and need for the proposed action. Alternative elements that were considered but were not technically or economically feasible, did not meet the purpose of and need of the project, created unnecessary or excessive adverse impacts on resources, and/or conflicted with the overall management of the national recreation area or its resources were dismissed from further analysis.

The NPS explored and objectively evaluated four alternatives in this plan/EIS:

Alternative A: No Action – Continuation of Current Management—Under the no-action alternative management of ORV use and access at the national recreation area would continue under current management strategies based on the 2007 *Interim OHV Use Plan* (NPS 2007a) as well as through the regulations contained in 36 CFR 7.57 and the Superintendent's Compendium. ORV use would continue to be permitted throughout Rosita Flats below the 3,000-foot elevation line and at Blue Creek along the creek bottom from cutbank to cutbank. No additional management tools such as zoning, permits, or use limits would be implemented.

Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes—Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to conflict with one another. Established zones could include camping only, hunting, resource protection, low-speed, and beginner. At Rosita Flats, two areas would be established as an ORV "area" and open to ORV use: 1) the area south of the river (currently denuded of vegetation) and 2) the area east of Bull Taco Hill. Access to the riverbed from the ORV use area south of the river would be from designated access points only. Outside the two ORV use areas, ORV use would be permitted only on designated, marked routes. At Blue Creek, ORVs would be allowed only on sandy bottom areas and designated routes, with ORV use prohibited on vegetated areas.

Alternative C: Management through Use of a Permit System at Current ORV Use Areas—Under alternative C the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except that there would be one designated ORV use area in Rosita Flats, instead of two.

Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas—Under alternative D the national recreation area would, in part, base the designation of routes and

areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area, but would not establish use limits.

Details of the management actions associated with these alternatives are specified in "Table 2: Alternative Elements Summary." The following sections describe the elements common to all alternatives and further describe the specific actions under each alternative, including the no-action and action alternatives.

ELEMENTS COMMON TO ALL ALTERNATIVES

The following describes alternative elements common to all alternatives, including the no-action alternative.

OPERATOR/VEHICLE REQUIREMENTS

Vehicles operating in any ORV use area of the national recreation area must have an ORV use decal, per Texas state law.

All-terrain vehicle (ATV)-specific operator and vehicle requirements, per Texas state law, include the following:

- ATV operators must wear eye protection and helmets approved by the Texas Department of Transportation.
- ATV operators must possess valid safety certificates issued by the state of Texas under Section 663.031 of the Texas Transportation Code.
- Any ATV operator under the age of 14 must be accompanied by a parent or guardian.
- ATV operators may not carry passengers unless the vehicle is designed by the manufacturer for carrying passengers.

NATIONAL PARK SERVICE REGULATIONS

Title 36 of the CFR, "Parks, Forests, and Public Properties," is applicable in all national park units, including Lake Meredith National Recreation Area. These regulations include those in Title 36 applicable to the operation of ORVs in the park and those applicable to individuals recreating at the park. Of particular note are the provisions of 36 CFR 1.5 and 1.6, which state that the superintendent may impose public use limits or may close all of the park or a portion of a park area to all public use or to a specific use or activity, may designate areas for a specific use or activity, may impose conditions or restrictions on a use or activity, and may establish a permit, registration, or reservation system.

SUPERINTENDENT'S COMPENDIUM

The provisions detailed in Superintendent's Compendium define recreation area–specific regulations imposed under the discretionary authority of the superintendent of the recreation area. These provisions, as described below, are common to all alternatives, and may vary annually as the contents of the compendium change.

TABLE 2: ALTERNATIVE ELEMENTS SUMMARY

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative A: No Action – Continuation of Current Management	Continuation of management by the 2007 *Interim OHV Use Plan* and regulations contained in the Superintendent's Compendium.	ORV use permitted at two designated areas: Rosita Flats—use authorized below the 3,000-foot elevation line. Blue Creek—use authorized in and along the creek bottom (cutbank to cutbank).	ORVs permitted in two areas in the national recreation area (Rosita Flats and Blue Creek)—in those areas, no separation of visitor uses.	No NPS vehicle permit required to operate an ORV at Rosita or Blue Creek ORV use area. A decal would be required by the state for all motorized vehicles, but not administered by the national recreation area.	No use limits in designated ORV use areas.	No limitations on the times when vehicles can operate in Rosita Flats and Blue Creek ORV use areas.	Each ATV user younger than 14 must be accompanied by a parent or guardian. ORVs may not carry passengers unless the ORV is designed by the manufacturer for carrying passengers.	All ATV operators must wear eye protection and helmets approved by the Texas Department of Transportation. Each ATV operator must possess a valid safety certificate issued by the state of Texas under Section 663.031 of the Texas Transportation Code.	No speed limits other than on national recreation area roads, as established in the CFR.	No interpretation provided at Rosita Flats or Blue Creek. Bulletin boards with campground rules and regulations and other national recreation area information located at Blue Creek and Rosita Flats. Education through visitor contact with rangers, maintenance staff, other national recreation area staff, and on-site educational opportunities. Trash bags provided on busy weekends. A site bulletin regarding ORV use at headquarters and at ranger station, and also at the Blue Creek and Rosita Flats bulletin boards on a larger scale. The bulletin boards are currently out of date.	Camping permitted at Rosita Flats and Blue Creek, without designated camping areas. Campfires regulated under the Superintendent's Compendium. Further restrictions in place during high fire-danger times (following the county burn bans). Amenities provided: Blue Creek: picnic tables, trash receptacles, pit toilets. Rosita Flats: picnic tables, trash receptacles (at entrance).	Blue Creek: Trash pickup from mid-April to September on a daily basis and as needed (two to three times per week) from October to April. Rosita Flats: Trash pickup once per week.	Rules and regulations related to ORV use at Rosita Flats and Blue Creek enforced by national recreation area law enforcement officers. Continuation of current methods of enforcement, including patrolling Rosita Flats, with more frequent patrols at Blue Creek due to the remote nature of Rosita Flats. Interagency law enforcement at large events.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Create zones in Rosita Flats and Blue Creek for various uses. In addition, implement a permit system for educational purposes that would be easy for the visitor to obtain and at no cost.	ORV use permitted at Blue Creek. The use area at Blue Creek redefined as • ORVs would only be allowed on sandy bottom areas and designated routes (figures 6 and 7 in the "Description of the Action Alternatives") section. • ORV use prohibited on vegetation. • Designated routes and camping areas marked by carsonite posts. ORV use permitted at Rosita Flats and redefined as • Area south of river (currently denuded) open to ORV use, with no designated access points to the riverbed area. • Other ORV use (outside the area described above) allowed only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off designated ORV routes. Driving on vegetation prohibited. Zoning system applied as a "layer" to these use areas, as described in the next column.	Establish a zone system in Blue Creek and Rosita Flats ORV use areas to provide for a separation of visitor uses. Zones include • ORV routes/areas. • Camping-only zones with vehicle access provided to the area but no recreational vehicle use allowed. Speeds limited to 15 mph within camping-only zones. Camping-only zones are shown on figures 6 and 7 in the "Description of the Action Alternatives" section. • Designated hunting areas zoned for an ORV closure during rifle season (would not apply to ORV use for hunting). On average, these closures would last two to eight weeks (up to two months). • New low-speed, beginner zone at loop in Rosita Flats area. • At Blue Creek a new low-speed zone for family use on either side of the Farm to Market (FM) 1913 bridge (see speed limits). • A resource protection zone in Rosita Flats where vehicles with a wheel width greater than 64 inches would not be permitted.	No-cost educational permit required for access to ORV use areas. Same permit for both ORV use areas. No limit on the number of permits issued. Permit could be obtained easily (i.e., online, at the visitor's center, and at local shops, like existing boat permits), or from rangers in the field. Permit would consist of a piece of paper or brochure and would contain ORV regulations and information. The permit would need to be signed by the operator and kept in the vehicle.	Same as alternative A.	No operation of non-registered motorized vehicles in designated campground zones/areas 10:00 p.m.–6:00 a.m. All ORVs must display lighted headlights and taillights after dark.	Same as alternative A, plus: All ORVs must have a muffler, spark arrester, and functioning headlights and taillights. Muffler requirements—96 decibel limit for ORVs. Park rangers to use decibel meters to measure.	Same as alternative A, plus: All ATVs must have a triangular orange flag on top of an 8-foot pole attached to the back of the ATV.	Speed limit of 15 mph in camping-only zones. Outside these areas, a speed limit of 35 mph on all ORV routes and 55 mph on sandy bottom flats. A lower speed limit (could be 15 mph) within sight of the bridge at Blue Creek (about a half mile in either direction)—signs painted on bridge pillars (creates a low-speed use zone for families to play in the water; see "zone system" column). In Rosita Flats, provide a lower speed limit for beginner loop (less than 20 mph).	Same as alternative A, plus: • Provide safety literature and trash bags to users. ORV and other rules could be printed on the trash bags. Rangers seek out visitors and provide this information and increase visitor contacts • Provide ORV safety programs in schools and attend Fritch Howdy Neighbor Day. • Increase education about ORVs at community events the national recreation area staff attends. • Add ORV education to Water Safety Day. • Provide signs to local businesses containing Lake Meredith National Recreation Area ORV use area map and rules. • Increase educational signs in ORV use areas. • Establish a volunteer group to assist with cleanup and other efforts. • Develop "tread lightly" pamphlet for ORV use.	Designated camping zones with lower speed limit. Picnic tables and fire pits in these areas as funding allows (not funded through the permit system). No camping in designated ORV routes or areas. No additional amenities provided beyond alternative A (except for designated camping areas).	Same as alternative A, plus: Add waste management issues to educational components.	Law enforcement staff levels increased. ORV use outside designated routes and areas could cause routes/areas to close temporarily. Post signs prohibiting ORV use in areas of isolated pools during times of drought.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Manage ORV use (including level of use) with a permit system with a fee at Rosita Flats and Blue Creek. Develop a monitoring plan and criteria for use limits.	Blue Creek: Same as alternative B. Rosita Flats: Same as alternative B, except there is no designated ORV use area east of Bull Taco Hill.	Same as alternative A.	Fee permit required to access the ORV use areas. Price structure consistent with boat permits. Permits available for $4/day, $10/three days, and $40/year. Same permit for both ORV use areas. Potential for limits on number of permits based on results of use limit studies. Permits available via mail, at headquarters, online, or at other vendors. A kiosk and "Iron Ranger" could be used to supply daily permits. Permit would take the form of a bumper sticker on the ORV (even those brought in by trailer). Provide permit holders with a Lake Meredith National Recreation Area ORV regulations brochure.	Develop use limits based on indicators and standards developed through the GMP planning process. Criteria developed and monitored to determine when the use limit is reached. Develop monitoring plan to describe these studies and how the implementation of use limits would be achieved.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Same as alternative B, plus: interpretive wayside program starting at Blue Creek and expanding as necessary. Cost of program covered by permit fee.	Designated camping areas with lower speed limits would be established for tent and vehicle camping. Establish fire pits and designated campsites using funds from permit fees. No camping on designated ORV routes. Outside designated camping areas, tent camping would be permitted in areas that have no vegetation or previously disturbed vegetation. Visitors in these areas would be required to walk into their campsites because vehicles must be parked off vegetation along designated ORV routes or areas. Pit toilets, fire rings, and picnic tables in the designated camping areas would be provided, on a phased basis. While these would be the priority, other amenities could include shade shelters, emergency call stations, and additional kiosks and bulletin boards for more information.	Same as alternative B.	Law enforcement staff levels increased and additional law enforcement resources provided using funds from permit fees. Explore options for having law enforcement staff located closer to the Rosita Flats ORV use area. Develop a monitoring plan that looks at vegetation, erosion, and other predetermined factors. Aerial imagery to track new visitor-created routes/ noncompliance. ORV use outside designated routes and areas could cause routes/areas to close temporarily.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas	Develop a permit system with a fee to allow NPS to provide additional amenities and increase enforcement in the two ORV use areas. No user capacity established.	ORV use permitted at Blue Creek as described under alternative B. ORV use permitted at Rosita Flats and redefined as • Area south of river (currently denuded) open to ORV use. Designated access points to the riverbed area would be established. • Area east of Bull Taco Hill open to ORV use. • Other ORV use (outside the area described above) allowed only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off designated ORV routes. Driving on vegetation prohibited. A zoning system would be applied as a "layer" to these use areas, as described in the next column.	Establish a zone system in Blue Creek and Rosita Flats ORV use areas to provide for a separation of visitor uses. Zones include • ORV routes/areas. • Camping-only zones with vehicle access provided to the area but no recreational vehicle use allowed. Speeds limited to 15 mph within camping-only zones. Camping-only zones are shown on figures 6 and 7 in the "Description of the Action Alternatives" section. • Designated hunting areas zoned for an ORV closure during rifle season (would not apply to ORV use for hunting). On average, these closures would last two to eight weeks (up to two months). • New low-speed, beginner zone at loop in Rosita Flats area. • At Blue Creek a new low-speed zone for family use on either side of the FM 1913 bridge (see speed limits). • A resource protection zone in Rosita Flats where vehicles with a wheel width greater than 64 inches would not be permitted.	Fee permit required to access the ORV use areas. Price based on consistency with boat permits. Permits available for $4/day, $10/three days, and $40/year. Same permit for both ORV use areas. Permits available via mail, at headquarters, online, or at other vendors. A kiosk and "Iron Ranger" could be used supply daily permits. Permit would take the form of a bumper sticker on the ORV (even those brought in by trailer). Permit holders would also receive a Lake Meredith National Recreation Area ORV regulations brochure.	Same as alternative A.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Speed limit of 15 mph in camping-only zones. Outside these areas, a speed limit of 35 mph on all ORV routes and 55 mph on sandy bottom flats. A lower speed limit (could be 15 mph) within sight of the bridge at Blue Creek (about a half mile in either direction)—signs painted on bridge pillars (creates a low-speed use zone for families to play in the water; see "zone system" column). In Rosita Flats, provide a lower speed limit for beginner loop (less than 20 mph).	Same as alternative B, plus: Install fencing and signs around ORV use boundary at Rosita Flats to better define ORV use in this area.	Designated camping zones with lower speed limit. Picnic tables and fire pits as funding allows (through the permit system) in these areas. No camping in designated ORV routes or areas. Pit toilets, fire rings, and picnic tables in the designated camping zones provided, on a phased basis. While these would be the priority, other amenities could include shade shelters, emergency call stations, and additional kiosks and bulletin boards for more information.	Same as alternative B.	Law enforcement staff levels increased and additional law enforcement resources provided using funds from permit fees. Explore options for having law enforcement staff located closer to the Rosita Flats ORV use area. Develop a monitoring plan that looks at vegetation, erosion, and other predetermined factors. Aerial imagery to track new visitor-created routes/ noncompliance. ORV use outside designated routes and areas could cause routes/areas to close temporarily.

CAMPFIRES

The Superintendent's Compendium would continue to regulate camping-related activities, such as campfires, with additional restrictions during high fire-danger times (bans in Rosita Flats and Blue Creek follow county bans).

EDUCATION AND OUTREACH

Under all alternatives, the national recreation area would continue to

- Provide a bulletin board at Blue Creek and Rosita Flats with campground rules and regulations and other national recreation area information
- Provide education through visitor contact with rangers, maintenance staff, and other national recreation area staff, and through on-site educational opportunities
- Provide trash bags to visitors on busy weekends
- Develop a bulletin on ORV use areas and regulations, available at the national recreation area headquarters and at ranger stations (this information would also be displayed on the Blue Creek and Rosita Flats bulletin boards on a larger scale).

NO-ACTION ALTERNATIVE

The "no-action" alternative was developed because it could be a viable choice in the range of reasonable alternatives. It sets a baseline of existing and potential future impacts against which to compare the impacts of each action alternative. For this plan/EIS, alternative A (no action) represents a continuation of the current management as described in the *Interim OHV Use Plan* (NPS 2007a). Table 2 compares the actions that would be taken under each alternative.

ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A (no action), the national recreation area would continue to manage ORV use at Rosita Flats and Blue Creek per the 2007 *Interim OHV Use Plan*, as well as through the regulations contained in 36 CFR 7.57 and the Superintendent's Compendium as authorized under the national recreation area's special regulation at 36 CFR 7.57. This alternative would maintain the ORV use areas at Blue Creek, along the creek bottom, officially known as "cutbank to cutbank" (see figure 4), and at Rosita Flats below the 3,000-foot elevation line (see figure 5). No specific ORV routes would be established in either ORV use area.

User and operator requirements described under "Elements Common to All Alternatives" would continue to be implemented and enforced. There would also continue to be no limitation on the operating hours of vehicles in Rosita Flats and Blue Creek. There would be no established speed limits for ORV use in Rosita Flats or Blue Creek other than those on national recreation area roads as established in the CFR.

Alternative A would include camping opportunities throughout Rosita Flats and Blue Creek. There are currently no officially designated camping areas at either site, and camping could occur anywhere the visitor can access. Campfires would continue to be regulated under the Superintendent's Compendium, and could be restricted further during times of high fire danger, which follow when county burn bans are in effect. Existing amenities in these areas, such as picnic tables and trash receptacles, as well as pit toilets at Blue Creek, would be maintained, but none would be added.

The national recreation area would continue to provide waste disposal services at Blue Creek and Rosita Flats at the same frequency as under current conditions. At Blue Creek, trash pickup would occur on a daily basis from mid-April to September and as needed, typically two to three times per week, from October to April. At Rosita Flats, trash pickup would occur once a week year-round.

Rules and regulations related to ORV use at Rosita Flats and Blue Creek would be enforced by park law enforcement officers. Current methods of enforcement that would continue include patrolling Rosita Flats, with more frequent patrols at Blue Creek due to the remote nature of Rosita Flats. During high visitor-use times or special events, the NPS may coordinate with other agencies in the area for additional law enforcement support.

No additional ORV management measures, such as the establishment of user zones, use limits, or a permit system (beyond what is already required by the state), would be established.

Interpretation services would not be provided in Rosita Flats and Blue Creek. Additional education, research, and monitoring would occur as described under “Elements Common to All Alternatives.”

ACTION ALTERNATIVES

The action alternatives would establish designated ORV routes and areas, with some alternatives integrating additional ORV management techniques such as zoning, use limits, and permits.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

The following describes elements of the management actions common to all action alternatives—alternatives B, C, and D.

Operator/Vehicle Requirements—Additional operator/vehicle requirements would be implemented and would include the following:

- All ORVs would be required to have a functioning muffler system, a qualified spark arrester (ATVs only), and functioning headlights and taillights. If a vehicle does not have functioning headlights or taillights, it would be permitted to operate during the day, but not after dark.
- Vehicle mufflers on ORVs that allow more than 96 decibels of sound would be prohibited. Noise levels would be measured 20 inches from the vehicle exhaust, pursuant to the SAE J1287 standard.
- All ATVs would be required to have a triangular orange flag on top of an 8-foot pole attached to the back of the vehicle.
- All ORVs would be required to display lighted headlights and taillights after dark.

Waste Disposal—The NPS would continue to provide waste disposal services at Blue Creek and Rosita Flats and would develop new educational programs/materials for clarifying issues such as proper waste disposal techniques.

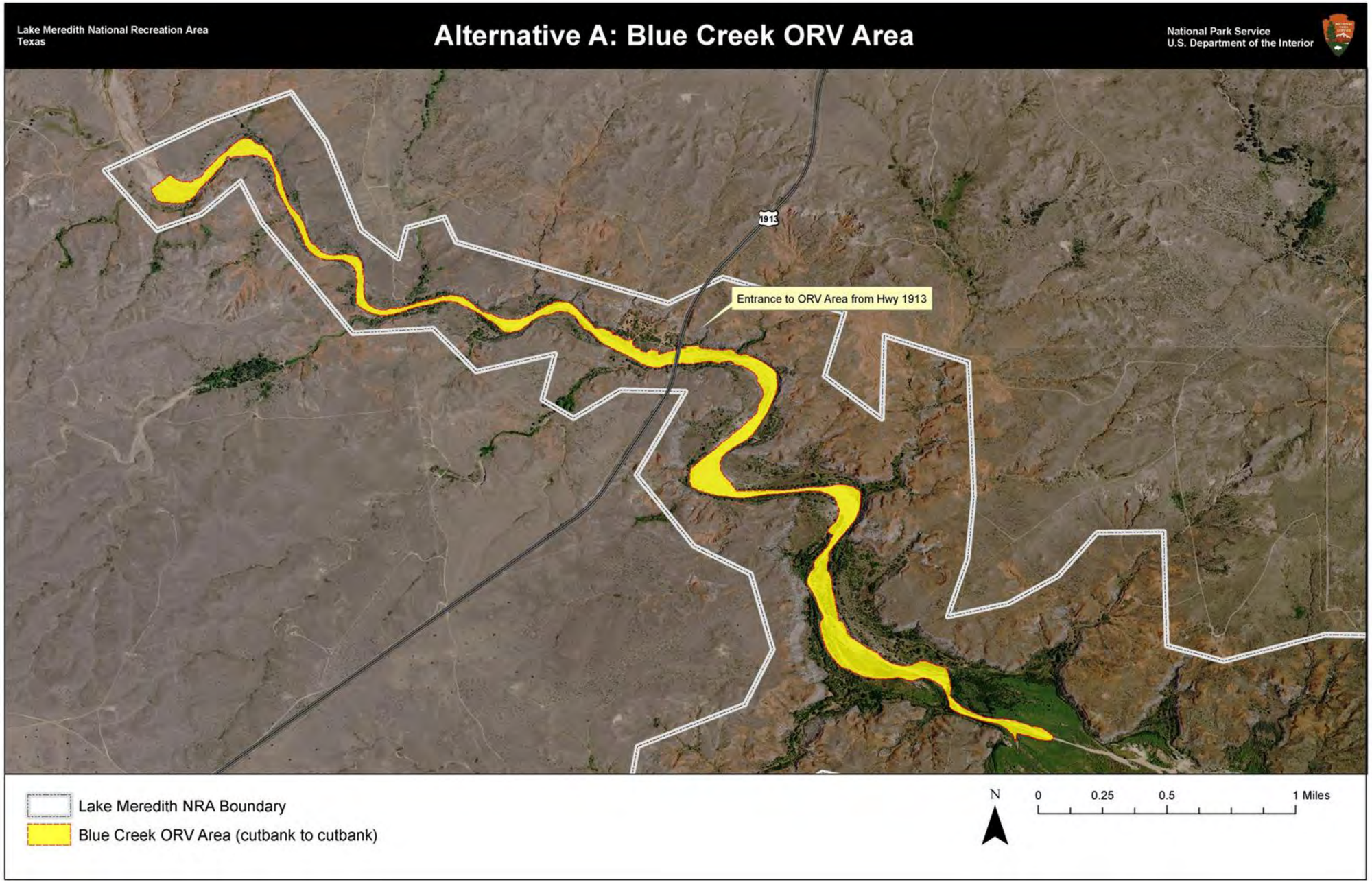

FIGURE 4: ALTERNATIVE A: BLUE CREEK OFF-ROAD VEHICLE USE AREA

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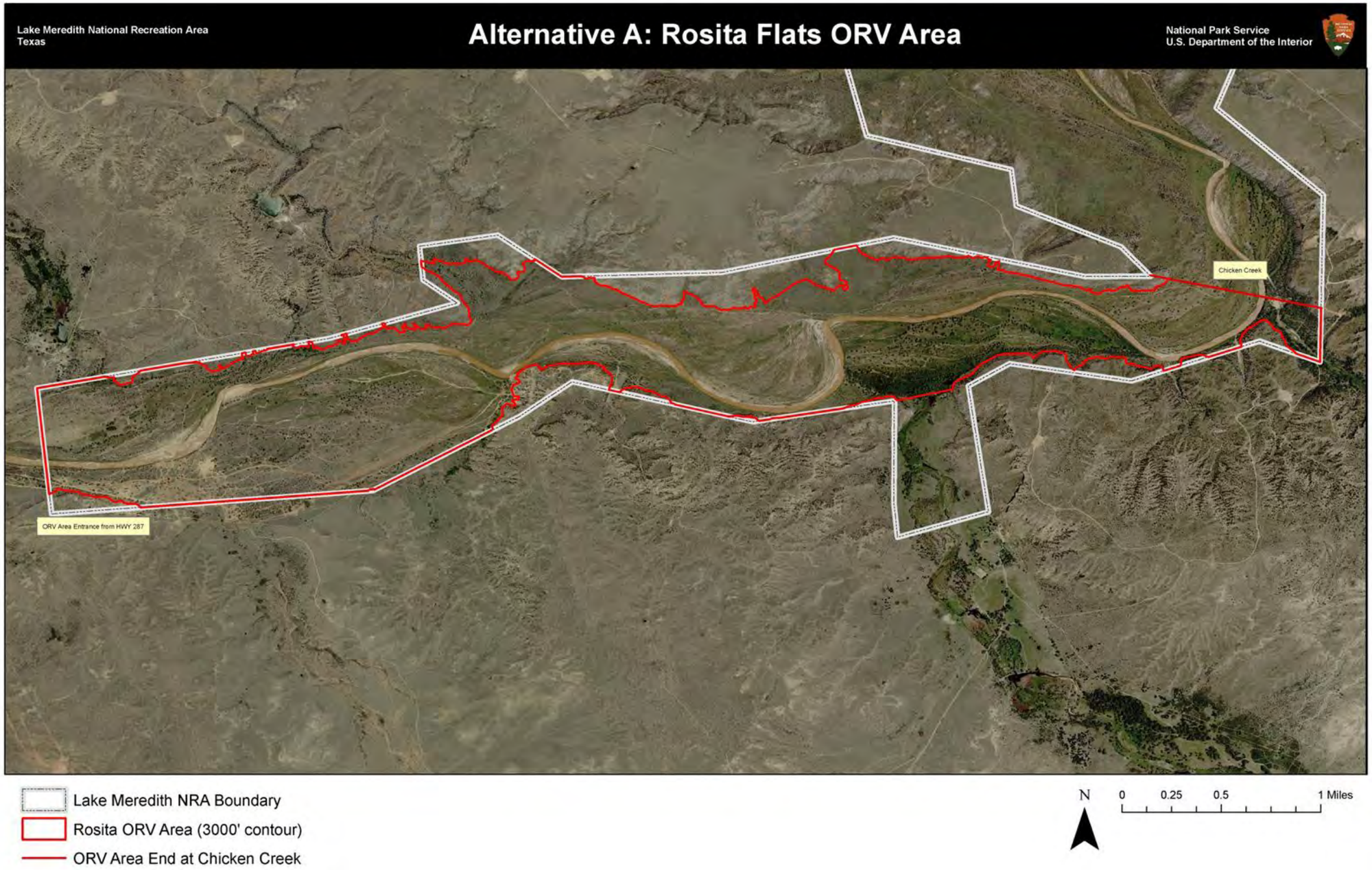

FIGURE 5: ALTERNATIVE A: ROSITA FLATS OFF-ROAD VEHICLE USE AREA

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Hours of Vehicle Operation—Under the action alternatives, there would continue to be no limitation on the operating hours of vehicles in Rosita Flats and Blue Creek except for in the designated camping areas, where non-registered motorized vehicles (such as ATVs/UTVs, dune buggies, etc.) would be prohibited from operating between 10:00 p.m. and 6:00 a.m. Visitors would be able to use their vehicles to access their camping site entrances and exits, but otherwise, quiet hours in campground areas would be between 10:00 p.m. and 6:00 a.m.

Glass Bottle Ban—All action alternatives would include a glass bottle ban in the Rosita Flats and Blue Creek ORV use areas.

Speed Limits—Speed limits in Rosita Flats and Blue Creek would be 35 mph on designated routes and areas, on sandy bottom flats the speed limit would be 55 mph, and in designated camping areas the speed limit would be 15 mph.

Temporary Route and Area Closures—The Superintendent may temporarily close ORV routes and areas if resource conditions warrant. This could include closing areas that become overly rutted or closing an area after heavy rains to prevent resource damage. Once the resource condition has been corrected or conditions improve, the area would be reopened to ORV use.

Arkansas River Shiner Protection Measures

Under the action alternatives, the national recreation area would take additional steps to ensure the protection of the Arkansas River shiner. These include, but are not limited to, the following:

- Parking or staging of vehicles of any kind would be confined to areas outside the wetted channel of the Canadian River.
- ORV use within park boundaries would be restricted to designated routes. Access to the river would be allowed only from designated access points.
- ORV use zones would be established in Rosita Flats in two areas currently devoid of vegetation. One is south of the Canadian River and the other is east of Bull Taco Hill. Outside of these areas, ORVs would be permitted only on designated, marked routes. ORVs may access the riverbed area only from marked and designated access points off the designated ORV routes (alternative D only).
- A resource protection zone of approximately 1,040 acres would be established north and east of the Bull Taco Hill ORV use area to protect vegetation and reduce oil erosion. This zone would permit only vehicles with a wheel width of 64 inches or less (applies to alternatives B and D only).
- Every two to four years, aerial photography would be used to determine if use is occurring outside of designated routes and areas.
- Educational materials would be provided when the visitor receives a permit (either with cost or at no cost, depending on the alternative). Educational messages would include information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These materials could also contain the statement, “The U.S. Fish and Wildlife Service (USFWS) recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed.”

Isolated pools are areas of water that have no connectivity between them, thus no flow entering or leaving the pool.

- Four to six times per week, on-the-ground NPS law enforcement would patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV violations. Monitoring for incidental take of Arkansas River shiner would occur at this time. Additional law enforcement patrols may occur as funding from ORV permits becomes available under the various alternatives.
- The national recreation area would monitor the shiner population every three to five years to ensure that additional management is not necessary.
- The superintendent always retains the authority to close any portion of the national recreation area for protection of park resources.
- The NPS shall develop and implement an appropriate monitoring plan for reporting progress in development of the property and implementation of the reasonable and prudent measures. Population monitoring for the Arkansas River shiner would occur every three to five years, as funding permits. The content, schedule, and format of the monitoring plan would be at the discretion of the NPS, but would take place no less than once every five years.
- The NPS would provide sufficient guidance to its employees and contracted employees to minimize incidental take and to ensure compliance with the terms and conditions of the biological opinion (USFWS 2014).
- Additional educational materials concerning Arkansas River shiner protection could be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of Arkansas River shiner conservation.

Cultural Resource Protection—Within the recreation area, archeological resources in ORV routes or areas would be protected and access to these resources would be restricted. Should additional resources be discovered within ORV routes or areas, the resources would be protected from ORV use.

Education and Outreach

The current education and interpretation efforts related to ORV use at Blue Creek would be expanded under all action alternatives to also include

- Providing literature and trash bags to users. Literature would contain basic safety messages (speed limits, etc.). ATV rules and other national recreation area rules could be printed directly on the trash bags. NPS field staff would visit each campsite to provide this information and increase visitor contacts.
- Providing ATV safety programs in schools, including more education about ORV use at community events the national recreation area staff attends, such as the Howdy Neighbor Day in Fritch.
- Including ORV education when providing information at the annual Water Safety Day program.
- Providing information containing Lake Meredith National Recreation Area ORV use area maps and rules to local retail establishments for display.
- Increasing the number of educational signs in ORV use areas and increasing patrols.
- Establishing a volunteer group to assist with cleanup and other efforts.
- Continuing to work with Texas Off-road Association on additional outreach efforts.
- Developing “tread lightly” pamphlets for ORV use.

Research and Monitoring

Under all action alternatives, national recreation area staff would monitor ORV use areas to identify ORV use outside designated routes and areas. National recreation area staff would monitor ORV use on the ground throughout the year and close visitor-created ORV routes and areas by using physical barriers, signs, etc., as appropriate. During monitoring, national recreation area staff would look for new trails and new signs of disturbance, including broken fence lines. Monitoring would also include a review of law enforcement records to determine how many citations are being issued for off-trail use.

Additional monitoring would be done by aerial photography. Photos would be taken of both ORV use areas every two to four years, depending on funding. National recreation area staff would use these aerial photographs to identify ORV use occurring outside designated routes and areas. National recreation area staff would provide physical barriers, signs, etc., as appropriate to prohibit ORV use on any new visitor-created routes. Additional patrols would likely resume as well. In addition, if park staff suspect off-trail use is occurring, periodic photos (known as photo points) would be taken to detect changes in the resource condition over time and the area would be closed if it is determined that the resource is being damaged.

Following the conservation recommendations in the biological opinion (USFWS 2014), the NPS would make efforts to ensure that instream survey monitoring for Arkansas River shiner within Rosita Flats is continued at a frequency that would continue to provide valuable information to the scientific community, but would not overly stress the local population. This information could be used to direct resource management decisions, as well as recovery efforts of the Arkansas River shiner population. As funding is available, efforts would be made to survey areas upstream of Rosita Flats (with landowner permission), which might be more adversely impacted in the absence of resource protection. Information on habitat conditions within this area might be useful in explaining fluctuations in Arkansas River shiner populations downstream in Rosita Flats.

User Capacity

The NPS defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing user capacity in national parks is inherently complex and depends not only on the number of visitors but on where visitors go and what they do. In managing user capacity, the NPS employs a variety of management tools and strategies rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires an adaptive approach to user capacity management.

The NPS defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park.

The ongoing GMP effort for Lake Meredith National Recreation Area and Alibates Flint Quarry National Monument establishes a parkwide user capacity program. This program includes indicators and standards for ORV use areas in Lake Meredith National Recreation Area. Indicators and standards are measurable features that are monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the NPS ensure that desired conditions are being met.

Table 3 includes the indicators, standards, and potential future management strategies that could be implemented in the ORV use areas. After the most appropriate indicators were identified, standards that represent the minimum acceptable condition for each indicator were assigned. The standards incorporate

qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

TABLE 3: SUMMARY OF USER CAPACITY INDICATORS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES APPLICABLE TO OFF-ROAD VEHICLE USE AREAS

Indicator	Zone	Standard	Management Strategies
Number of breaches to the designated boundary per month	ORV Semi-primitive	No more than six breaches of designated ORV boundary per month	Educate users on impacts of leaving designated ORV use areas Remotely monitor trails (for example, with cameras) Require permits Implement temporary closures
Change in campsite condition class	Developed ORV Rural Semi-primitive	No less than 15% above condition class 4 based on site condition assessment (to be measured annually)	Educate visitors in a program that includes the use of designated sites and the prohibition on camping outside designated areas; tools could include flyers, press releases, public events such as with hunters, and information postings at the visitor contact station and on waysides Mark designated campsites, survey with global positioning system equipment, and incorporate the results in the geographic information system to provide a baseline Increase enforcement
Number of incidences of camping outside designated areas	Developed ORV Rural Semi-primitive	Zero tolerance for camping in undesignated areas	Same as strategies for change in campsite condition class
Number of ticketed incidents related to damage of park resources per six-month period	Park-wide	No more than one ticketed violations related to park resources per six-month period	Provide pre-incident education Increase patrols based on locations of incidents / increase number of signs Implement more intensive mitigation measures based on resource impacted, such as applying coating that prevents graffiti from sticking, or rerouting trails Close facilities or areas if incidents continue
Number of incidences of vehicles traveling outside the designated road or route	Cultural Developed ORV Rural	Three informal roads within 0.5 mile of designated road or route	Educate visitors to increase awareness of the impacts associated with travelling on undesignated roads Increase number of signs, with Carsonite® poles Increase the number of patrols Close area to mitigate resource damage Physical damage and productivity

As monitoring of conditions continues, managers may decide to modify or add indicators if better ways are found to measure important changes in resource and social conditions. If ORV use levels and patterns change appreciably, NPS staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user capacity management program.

DESCRIPTION OF THE ACTION ALTERNATIVES

ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to conflict with one another. As shown on figures 6 and 7, ORV routes and areas would be established as follows:

- **Blue Creek—**ORVs would be allowed only on sandy bottom areas and designated routes (see figure 6), with ORV use prohibited on vegetated areas. Routes and areas where ORV use is allowed would be marked by carsonite posts.
- **Rosita Flats—**The area south of the river (currently denuded of vegetation) would be established as an ORV area and would be open to ORV use. Access to the riverbed from this ORV use area would be from designated access points only. A second ORV use area would be established east of Bull Taco Hill. Outside these ORV use areas, ORV use would be permitted only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off the designated ORV routes. In the ORV use area and on ORV routes, driving on vegetated areas would be prohibited.

Alternative B would also institute a zoning system that would be a “layer” on top of these routes and areas, further managing use. The following zones would be established:

- **Camping Only—**As shown on figure 6, areas would be established in Blue Creek and Rosita Flats that would be managed for camping. This management would include allowing ORVs in these zones only for camping and access purposes, prohibiting other recreational ORV use. These areas would be clearly marked with posts and cables. A 15 mph speed limit would be enforced in this zone to reduce the potential for conflicts between users. The road to the designated camping area in Rosita Flats would be improved, but not paved, to assist in the evacuation of visitors during rainstorms when the area becomes muddy.
- **Hunting—**At Rosita Flats and Blue Creek, areas that are already designated for hunting during rifle season would also be closed to recreational ORV use during this season. Hunters using ORVs for access for hunting would be allowed and would be required to stay on designated routes. The rifle hunting season (deer/general gun season) would be expected to last approximately eight weeks (two months) per year. During these months, ORV users who are not hunting would not be allowed in this zone.
- **Resource Protection—**A resource protection zone would be established in Rosita Flats north and east of the Bull Taco Hill ORV use area to protect vegetation and reduce soil erosion. This zone would permit only vehicles with a wheel width of 64 inches or less.
- **Low-speed—**At Blue Creek, a low-speed zone would be established on either side of the FM 1913 bridge, as many families recreate in this area and a lower speed limit would reduce the potential for conflicts between ORVs and non-ORV users. Low-speed zones would not be established at Rosita Flats.
- **Beginner—**At Rosita Flats, a “beginner” loop would be established to provide an opportunity for new riders to recreate in an area with others of a similar skill level. In this zone, the speed limit would be lower than 20 mph. Beginner zones would not be established at Blue Creek.

User and operator requirements described under “Elements Common to All Alternatives” and “Elements Common to All Action Alternatives” would be implemented and enforced.

Alternative B would allow camping throughout Rosita Flats and Blue Creek in designated camping-only zones (see figures 6 and 7), which would provide picnic tables and fire pits as funding permits. Camping would be prohibited outside these areas, including within designated ORV routes and areas. Existing amenities outside camping-only zones, such as picnic tables and trash receptacles, would be maintained, but no new ones would be added. The NPS would also explore the option of having “camp hosts” in the designated camping areas to assist visitors and provide information on the ORV rules and regulations in these areas. As discussed under “Elements Common to All Action Alternatives,” use would be restricted in the camping area from 10:00 p.m. to 6:00 a.m. to create quiet hours. At Rosita Flats, the road leading to the designated camping area would be improved, but not paved, to assist in the evacuation of visitors during rainstorms when the area becomes muddy.

The speed limit for ORVs in Rosita Flats and Blue Creek would be 15 mph in designated campground areas (camping-only zones). In addition, speed limit adjustments would be made in certain zones to reduce the potential for visitor use conflicts. These recommendations would include lowering the speed limit in sight of the bridge at Blue Creek (about a half mile in either direction) to 15 mph, and posting the speed limit on signs painted on bridge pillars. This lowered speed limit would create a low-speed zone so visitors could safely recreate in the water. In addition, at Rosita Flats, the beginner zone would include a reduced speed limit of 20 mph or less to provide a safer environment for new ORV users.

Rules and regulations related to ORV use at Rosita Flats and Blue Creek would be enforced by national recreation area law enforcement officers. During high visitor-use times or special events, the NPS may coordinate with other agencies in the area for additional law enforcement support. In addition, the national recreation area would increase law enforcement staff levels in an effort to increase the frequency of patrols. To encourage compliance, portions of ORV use areas could be closed to the public temporarily if evidence of ORV use is found outside designated routes and areas.

Education and outreach efforts at Blue Creek and Rosita Flats would be the same as those under “Elements Common to All Action Alternatives,” and would also include posting fences and signs around the ORV use boundary at Rosita Flats to better define where ORV use is allowed in this area.

Additional restrictions would include prohibiting ORV use in isolated pools of water during times of drought (when federally protected fish could be using the pools for habitat) and posting signs to inform the public of this restriction. Glass bottles would also be banned in the Rosita Flats and Blue Creek ORV use areas (see “Elements Common to All Action Alternatives”).

Alternative B would include a no-charge permit system, with no limit on the number of permits issued. To obtain the permit, ORV owners would be required to read education materials and sign for their permits. By signing for permits, users would be acknowledging they have read, understood, and agreed to abide by the rules of ORV use in the national recreation area. The signed permit materials must be kept in the vehicle being used in the national recreation area. Each permit would be valid for a one-year period for use at Blue Creek and Rosita Flats, and could be obtained easily (i.e., online, at the visitor center, or at local shops—similar to the current boat permit process—or from national recreation area rangers in the field). If a rider were found off designated trails, the NPS would recommend to the courts that the permit be revoked for the remainder of the year. If a rider violates the rules in either of the ORV use areas (Rosita Flats and Blue Creek) three times, the national recreation area would recommend to the court suspension of their permit privileges.

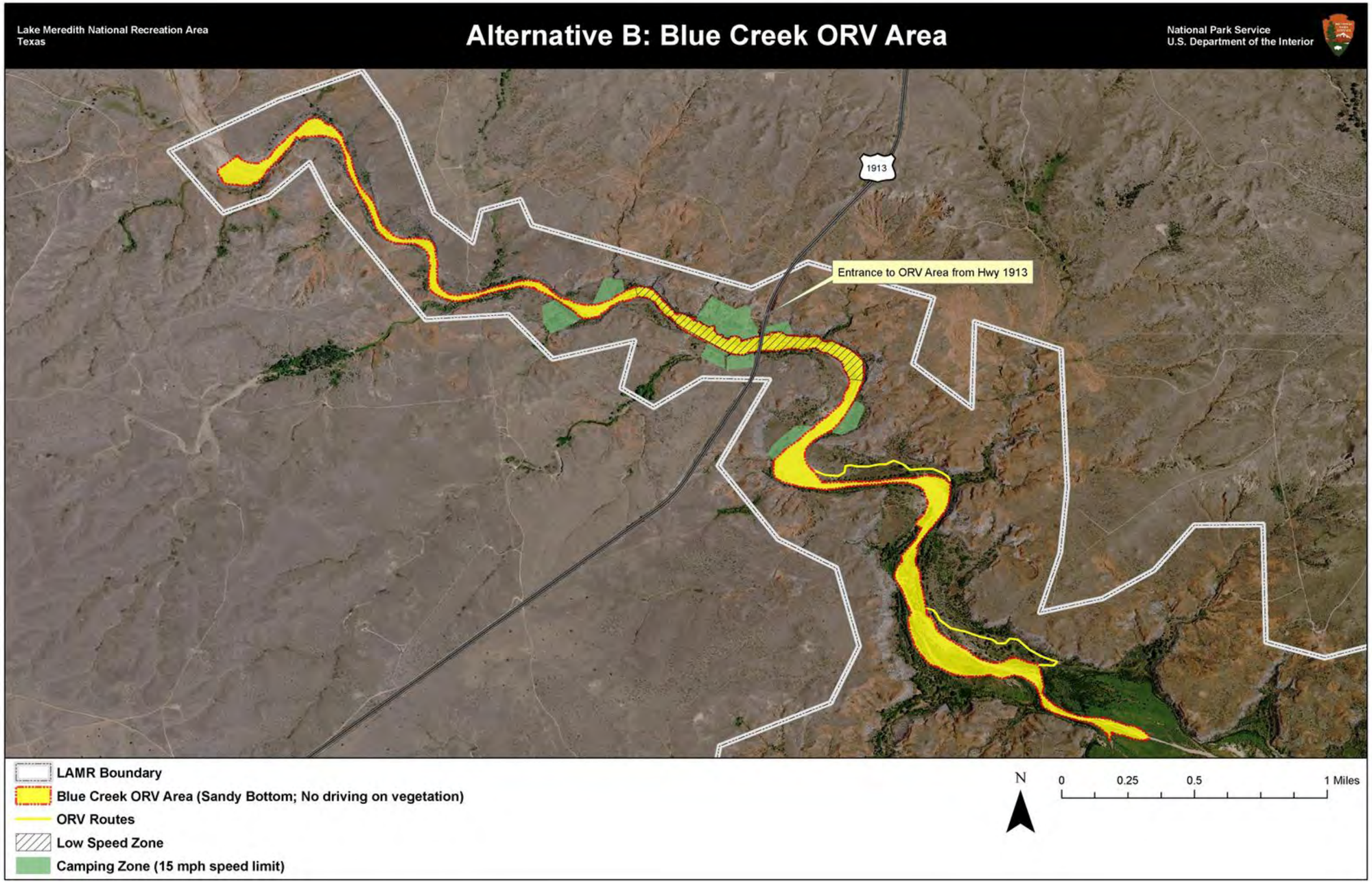

FIGURE 6: ALTERNATIVE B: BLUE CREEK OFF-ROAD VEHICLE USE AREA

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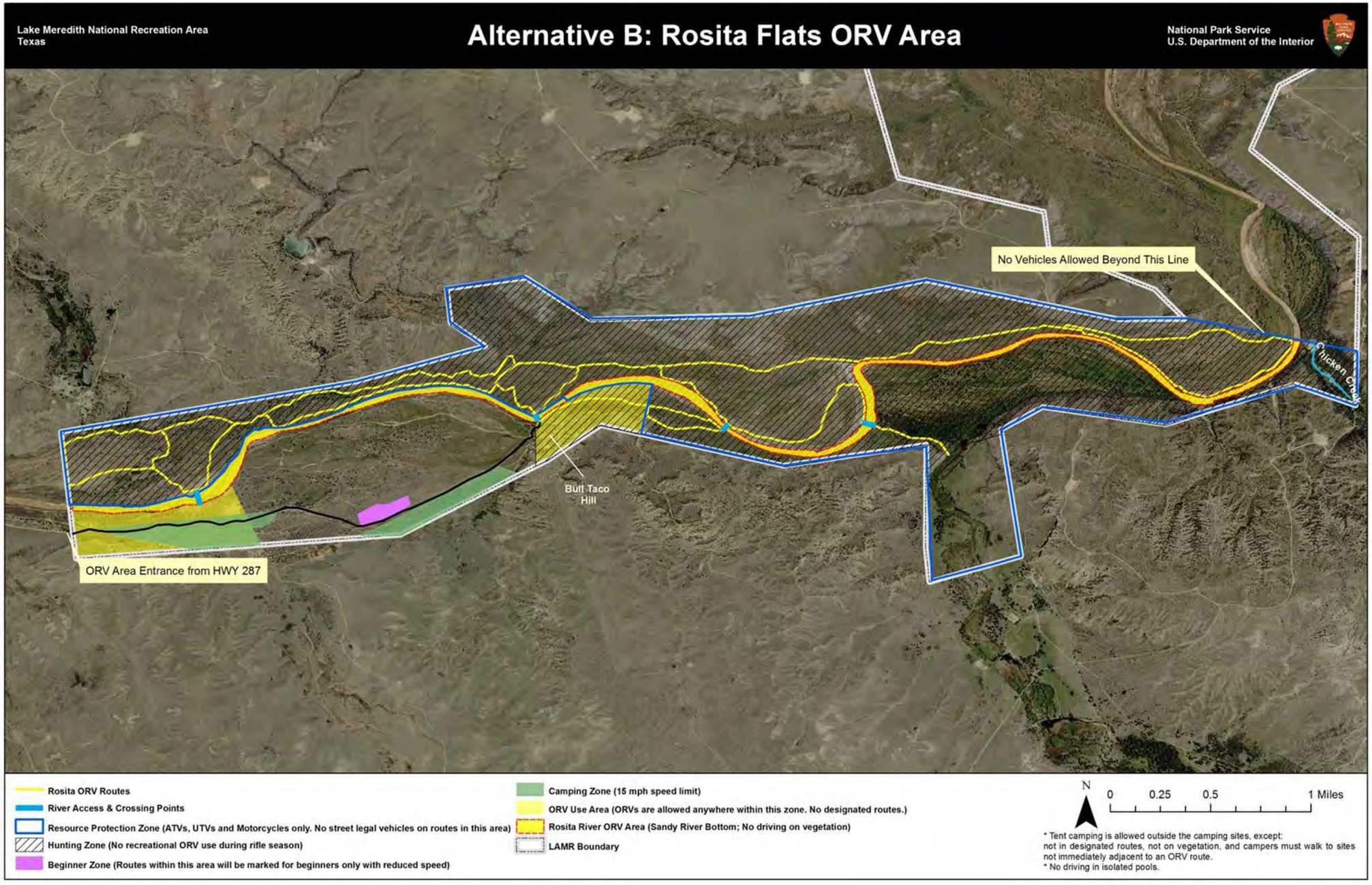

FIGURE 7: ALTERNATIVE B: ROSITA FLATS OFF-ROAD VEHICLE USE AREA

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Alternative B would also include increased coordination with the state of Texas if a new state park adjacent to Rosita Flats is established. This effort would include coordinating the resources of the NPS and the state in this area, particularly law enforcement and interpretive resources. The goal would be to maximize the potential efficiencies that could result from the proximity of the two ORV use areas, as provided for under 16 USC 1a-2(1), "Cooperative Management Agreements." This provision allows for national park system units adjacent to or near a state or local park area to enter into cooperative management where it will "allow for more effective and efficient management of the parks."

ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits, as described below. The following designated routes and areas would be established (the same as alternative B, except there would be no designated ORV use area east of Bull Taco Hill), as shown on figures 8 and 9:

- **Blue Creek—**ORVs would be allowed only on sandy bottom areas and designated routes (as shown on figure 8), with ORV use prohibited on vegetated areas. Routes and areas where ORV use is allowed would be marked by carsonite posts.
- **Rosita Flats—**The area south of the river (currently denuded of vegetation) would be established as an ORV area and would be open to ORV use. Outside this ORV use area, ORV use would be permitted only on designated, marked routes. Access to the riverbed would be from designated access points only. In the ORV use area and on ORV routes, driving on vegetated areas would be prohibited (see figure 9).

User and operator requirements described under "Elements Common to All Alternatives" and "Elements Common to All Action Alternatives" would be implemented and enforced.

Similar to alternative B, alternative C would include camping in designated camping areas in Rosita Flats and Blue Creek (see figures 8 and 9), with specific campsites established. In these designated camping areas, picnic tables and fire pits would be provided, as funding allows, with funding coming from the permit system, as described below. No vehicle camping (camping in a car, in a trailer, or in another motorized vehicle) would be allowed outside these areas, including in designated ORV routes and areas. Alternative C would permit tent camping (no vehicles) in previously disturbed areas or areas that have no vegetation. Campers would be required to park vehicles in an area away from vegetation along designated ORV routes or areas and walk to where tent camping is permitted to set up their tents. At Rosita Flats, the road leading to the designated camping area would be improved, but not paved, to assist in the evacuation of visitors during rainstorms when the area becomes muddy.

The NPS would also explore the option of having "camp hosts" in the designated camping areas to assist visitors and provide area ORV rules and regulations information. As discussed under "Elements Common to All Action Alternatives," camping areas would be subject to quiet hours from 10:00 p.m. to 6:00 a.m. Aside from designated camping areas, no other type of user zoning would occur under alternative C.

Existing amenities outside designated camping areas, such as picnic tables and trash receptacles, would be maintained. In addition, fees from the permit system (described below) would be used to provide potential additional amenities at Rosita Flats and Blue Creek, including pit toilets, fire rings, and picnic tables. Amenities would be provided on a phased basis, based on the level of use the added amenities receive, which would be an indication of demand for additional amenities. Depending on funding and demand,

other potential amenities could include shade shelters, emergency call stations, and additional information kiosks/bulletin boards.

Education and outreach efforts at Blue Creek and Rosita Flats would be the same as those under "Elements Common to All Action Alternatives." This alternative could also include the installation of an interpretive wayside exhibit program at Blue Creek as funding from the permit fees allows. The wayside program could be expanded if warranted by the level of visitor interest and available funding.

Under alternative C, the NPS would require users to obtain permits for their vehicles (including vehicles transported to the national recreation area on a trailer) before using the ORV use areas. ORV permit fees would recover costs incurred by the national recreation area for resource management, law enforcement, and maintenance associated with the two ORV use areas. The permit cost would be consistent with other permits at the national recreation area. This plan/EIS will not set or determine the cost of the fee permit, but it would likely be similar to the current boat permit ($4 per day, $10 for three days, and $40 for annual permit). An annual family permit would also be available and would be valid for up to four vehicles.

Similar to alternative B, ORV users would be required to read and sign educational materials prior to obtaining a permit. Permits would be available via mail, at headquarters, online, or at other vendors, with the potential for daily permits on site using unstaffed fee collection equipment such as "Iron Rangers." All ORV permits would be valid for use at Blue Creek and Rosita Flats. When first initiated, there would be no limit on the number of permits available; however, a limit could be instituted based on the results of use limit studies, as described below.

As with alternative B, the NPS would recommend to the courts that a permit be revoked for the remainder of the year if a rider were found off designated trails. If a rider violated the rules in either of the ORV use areas (Rosita Flats and Blue Creek) three times, the national recreation area would recommend to the court suspension of their permit privileges.

Alternative C would further manage ORV use by studying the number of ORVs used at the national recreation area and how that use relates to potential impacts on resources and visitor use and experience. To accomplish this, the national recreation area would develop indicators and standards, as discussed under "Elements Common to All Action Alternatives": User Capacity. National recreation area law enforcement officers would enforce rules and regulations related to ORV use at Rosita Flats and Blue Creek. During high visitor-use times or special events, the NPS would coordinate with other agencies in the area for additional law enforcement support. Using ORV permit system fees, the national recreation area would increase law enforcement staff levels in an effort to increase the frequency of patrols as well as providing additional amenities to national recreation area users. The NPS would also explore options for having law enforcement staff located closer to the Rosita Flats ORV use area on a regular basis. To encourage compliance and to allow time for impacted areas to recover, portions of ORV use areas could be closed to the public temporarily if evidence of ORV use is found outside designated routes and areas. In addition to on-the-ground monitoring, aerial photography could be used to track improper ORV use.

As described under alternative B, alternative C would involve management agreements between the national recreation area and the state if a new state park is established.

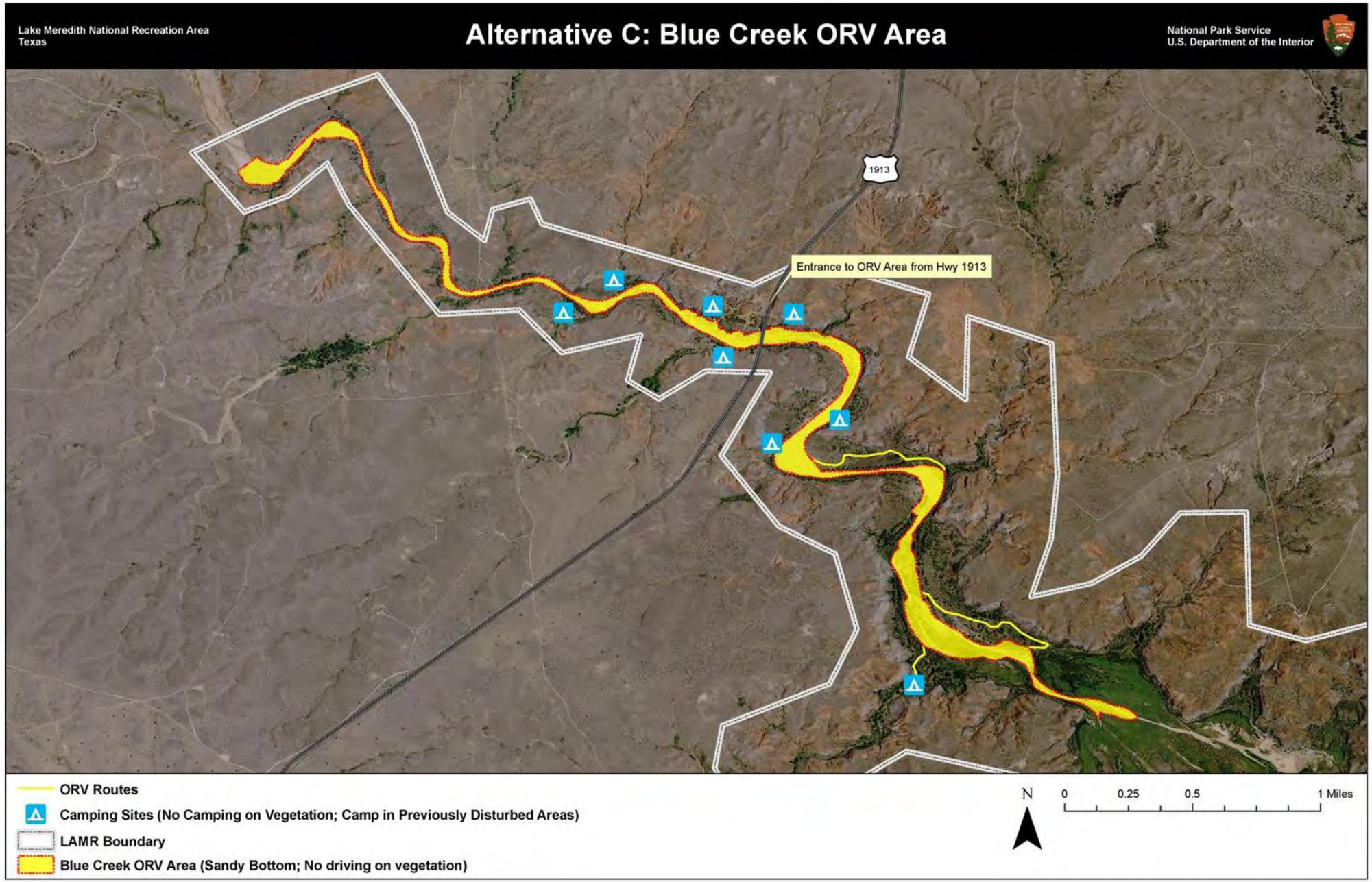

FIGURE 8: ALTERNATIVE C: BLUE CREEK OFF-ROAD VEHICLE USE AREA

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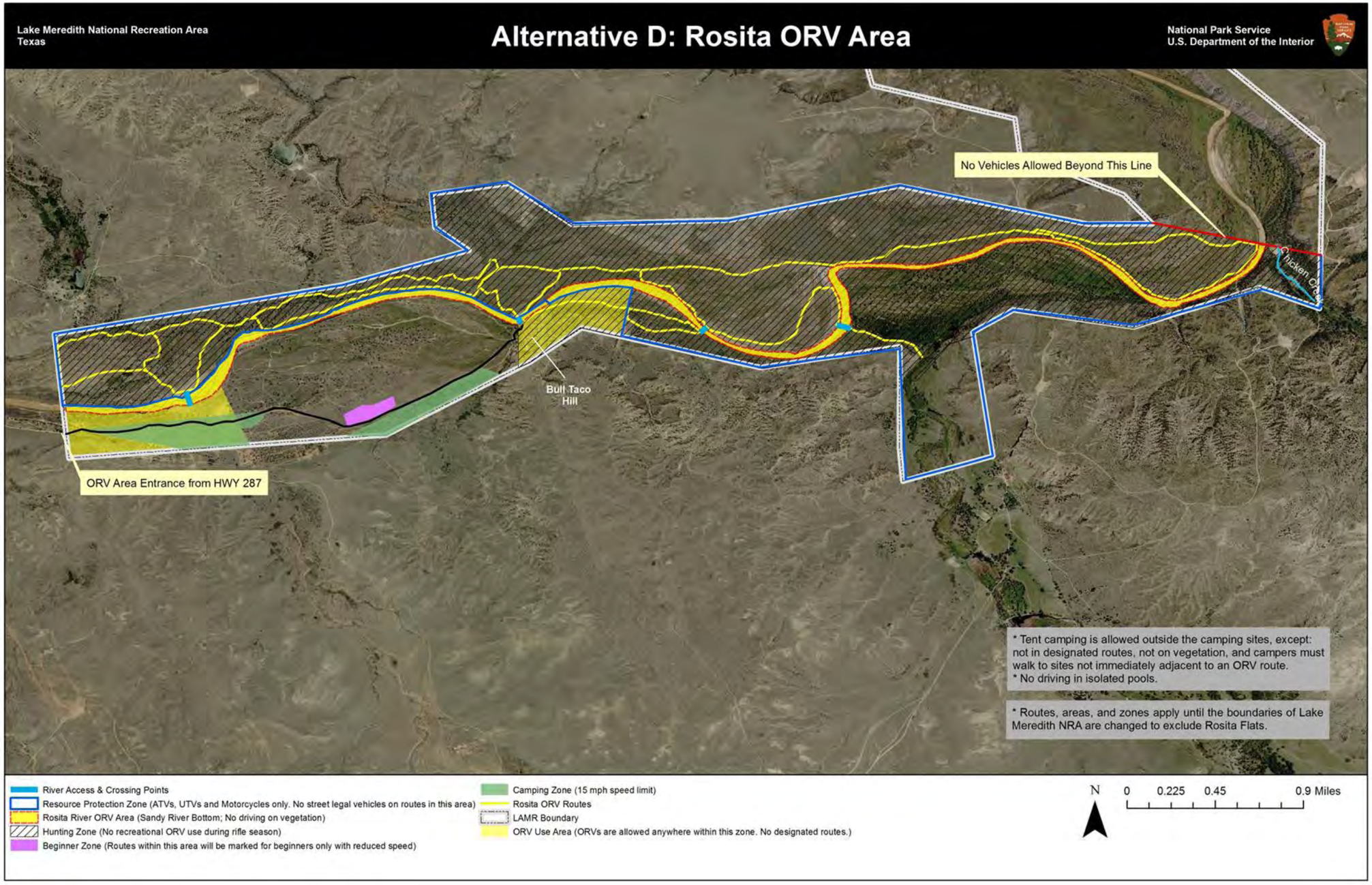

FIGURE 9: ALTERNATIVE C: ROSITA FLATS OFF-ROAD VEHICLE USE AREA

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ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

Under alternative D the national recreation area would base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to conflict with one another. As shown on figures 10 and 11, ORV routes and areas would be established as described under alternative B.

User and operator requirements described under “Elements Common to All Alternatives” and “Elements Common to All Action Alternatives” would be implemented and enforced.

Similar to alternative B, alternative D would include camping in designated camping areas in Rosita Flats and Blue Creek (see figures 10 and 11). In these designated camping areas, picnic tables and fire pits would be provided as funding from the permit system allows, as described below. No vehicle camping (camping in a car, in a trailer, or in another motorized vehicle) would be permitted outside these areas, including within designated ORV routes and areas. Alternative D would permit tent camping (no vehicles) in previously disturbed areas or areas that have no vegetation. Campers would be required to park vehicles in an area away from vegetation along designated ORV routes or areas and to walk to where tent camping is permitted to set up their tent. At Rosita Flats, the road leading to the designated camping area would be improved, but not paved, to assist in the evacuation of visitors during rainstorms when the area becomes muddy.

Existing amenities outside designated camping areas, such as picnic tables and trash receptacles, would be maintained. In addition, fees from the permit system (described below) would be used to provide potential additional amenities at Rosita Flats and Blue Creek, including pit toilets, fire rings, and picnic tables. Amenities would be provided on a phased basis. Depending on funding and demand, other potential amenities could include shade shelters, emergency call stations, and additional information kiosks/bulletin boards.

Education and outreach efforts at Blue Creek and Rosita Flats would be the same as those under “Elements Common to All Action Alternatives.” This alternative could also include the installation of an interpretive wayside exhibit program at Blue Creek as funding from the permit fees allows. The wayside program could be expanded if warranted by the level of visitor interest and if funding were available.

Under alternative D, the NPS would require users to obtain a fee permit for their vehicles as described under alternative C.

HOW ALTERNATIVES MEET OBJECTIVES

As stated in “Chapter 1: Purpose of and Need for Action,” all action alternatives selected for analysis must meet all objectives to a substantial degree. The action alternatives must also address the stated purpose of taking action and resolving the need for action; therefore, the alternatives were individually assessed in light of how well they would meet the objectives for this plan and the EIS. Alternatives not meeting the objectives were not analyzed further (see “Alternative Elements Considered but Dismissed from Further Analysis”).

Table 4 compares how each of the alternatives described in this chapter would meet plan objectives. “Chapter 4: Environmental Consequences” describes the effects of each alternative on each impact topic, which are summarized in table 5.

ALTERNATIVE ELEMENTS CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

Comments received during scoping and public comments on the draft plan/EIS included suggestions for alternatives or actions within alternatives. For various reasons, some of these alternatives or actions were eliminated from further study. Those alternatives and actions dismissed from further consideration did not meet the definition of a reasonable alternative, as stated by the CEQ. The CEQ states that "reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant." In addition, they also meet project objectives, resolve need, and alleviate potentially significant impacts on important resources.

The CEQ states that "reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant."

An alternative is not automatically rendered unreasonable if it requires the amending of a park plan or policy; causes a potential conflict with local, state, or federal law; or lies outside the scope of what Congress has approved or funded or outside the legal jurisdiction of the NPS. The rationales for dismissing these alternative elements are presented in this section.

Boundary Change to Exclude Rosita Flats from Lake Meredith National Recreation Area— Throughout the planning process, the NPS has considered requesting a change in the boundary of the national recreation area to exclude Rosita. While the NPS does not oppose a boundary change and can see benefits to a single management unit in the Rosita Area, this option is not being evaluated in this plan/EIS. A potential boundary change has been excluded from the analysis because there are no current opportunities or anticipated funding for a combined management unit or for a state-operated ORV park at this time.

Therefore, any analysis in this document would be too speculative to provide an accurate description of how the lands would be managed subsequent to divestiture. The NPS plans to continue to work collaboratively with the State of Texas in managing ORV use in the Rosita Flats area. At a future date, the NPS is likely to reevaluate this issue because a boundary change would have many benefits for the NPS. If or when the NPS considers a boundary change again, the public would be notified and the NPS would initiate a new NEPA process.

Providing ORV Access from the Route 287 Bridge All the Way to Plum Creek or Blue Creek— Providing a new ORV route from the Route 287 bridge to Plum or Blue Creek would be difficult due to topographic constraints. The remoteness and physical condition of the route would make it difficult for national recreation area rangers and emergency vehicles to respond to health and safety issues. Additionally, a new route would result in new natural resource impacts, including erosion, loss of vegetation, and potential wildlife disturbance in an area that is not currently used for off-road travel. This alternative was dismissed because of the potential impacts on visitor safety as well as on natural resources.

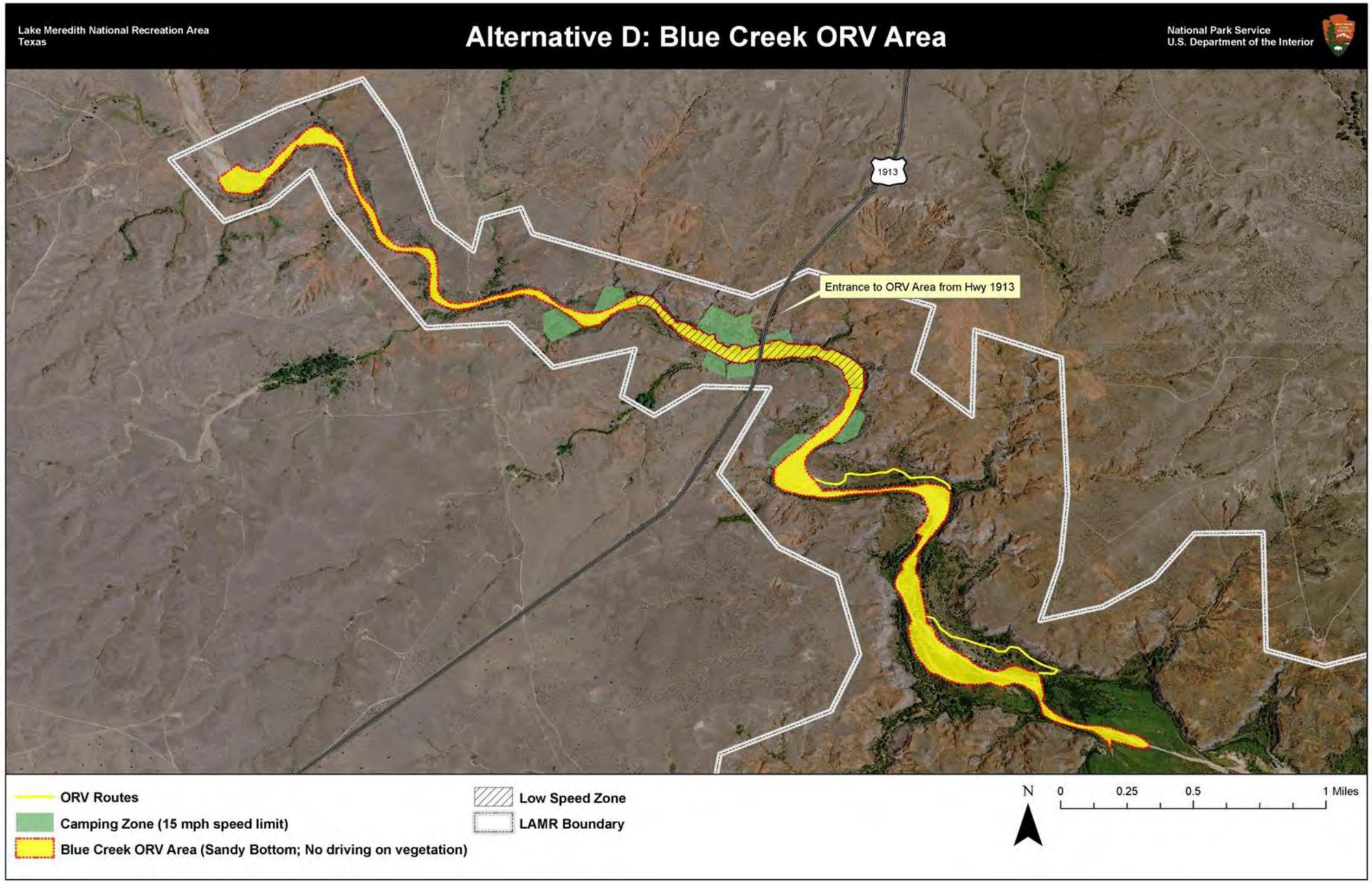

FIGURE 10: ALTERNATIVE D: BLUE CREEK OFF-ROAD VEHICLE USE AREA

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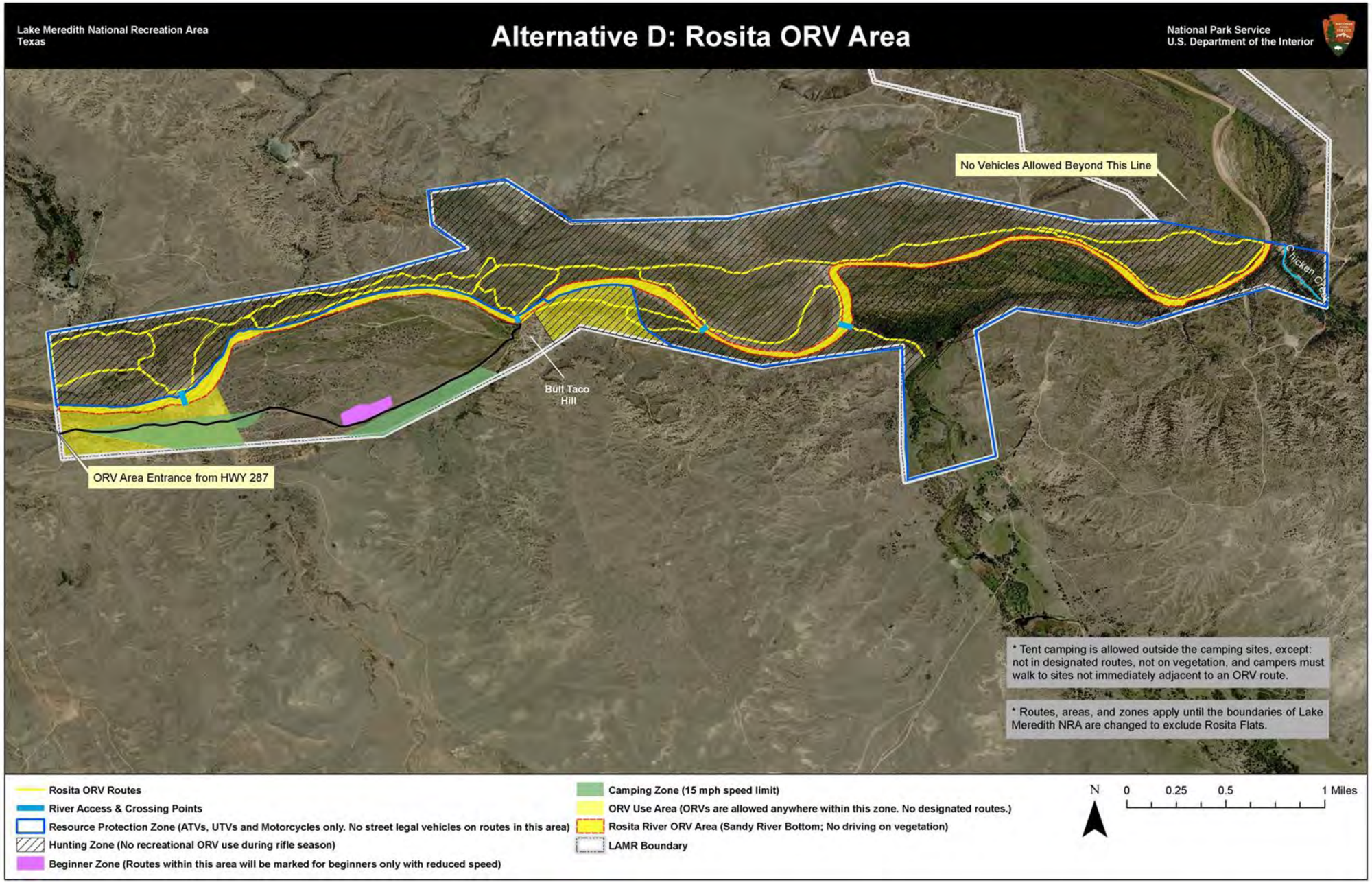

FIGURE 11: ALTERNATIVE D: ROSITA FLATS OFF-ROAD VEHICLE USE AREA

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Providing ORV Access at Mullinaw Creek—The national recreation area determined that additional access should not be provided at Mullinaw Creek due to sensitive resources present in this area. Currently, pedestrians may access this area but motorized vehicles are not allowed. The numerous archeological resources that are located between Mullinaw Creek and Rosita Flats would be disturbed if ORVs were given access. Because NPS is required to protect these resources under the National Historic Preservation Act, as well as under NPS *Management Policies 2006*, this option was considered but dismissed from further analysis.

Seasonal Closures as a Management Element—Seasonal closures to ORVs were considered in certain areas of Rosita Flats and Blue Creek to protect resources. Although the Arkansas River shiner was found in Rosita Flats, sufficient protection would be provided by other elements in the alternatives, such as designated access points to the river, to minimize impacts on this species. Under all alternatives, the superintendent would continue to have authority to enact site-specific resource closures as needed. Because other alternative actions would address Arkansas River shiner protection, seasonal closures were considered but dismissed from further analysis.

Expanding ORV Use to Areas Outside Blue Creek and Rosita Flats—The creation of new ORV use areas was considered, but the national recreation area determined that this ORV plan should focus on ensuring compliance for existing areas before considering new areas. Planning for new ORV use areas would need to occur under a separate planning process, because establishment of new routes and areas is not part of the purpose of and need for this plan. Expanding ORV use to new areas was also dismissed because vehicle use in areas previously untouched by motorized use could result in new resource, visitor use and experience, and staffing impacts. Such impacts could include

- Degradation of water quality and drinking water through increased soil erosion from additional ORV use areas
- Habitat fragmentation from the establishment of additional ORV routes and areas
- Lack of staff to provide services to additional areas
- Exacerbation of existing trespassing problems
- Potential for additional conflicts with other national recreation area visitors and recreational uses.

Expanding ORV access in Blue Creek to Blue East Beach was considered, but sensitive habitat (such as wetlands) near Blue East Beach could be substantially impacted by ORV use. Also, because the area is remote, adequate trash removal or installation of proper toilet facilities by the NPS would be difficult. Any accumulation of trash and human waste would pose a threat to public health because Lake Meredith serves as a public drinking water supply. Further, the remoteness of the site would make it difficult for the NPS to respond to an emergency situation. Therefore, due to potential environmental impacts and human health considerations, providing ORV access to new areas, such as Blue East Beach, was considered but dismissed from further analysis.

Providing Guided Tours—NPS staff providing guided tours of the ORV use areas was considered in the range of alternatives. The NPS determined that visitor use patterns in Rosita Flats and Blue Creek show that visitors tend to come from the local area and use their ORVs for pleasure driving and camping. These users also tend to be repeat visitors already familiar with the use areas. Because of the nature of visitor use in the areas of Blue Creek and Rosita Flats, national recreation area staff did not believe sufficient demand exists for a guided ORV tour; therefore, this element was considered, but not carried forward for analysis. The inclusion of an interpretive wayside exhibit in Blue Creek that would provide information on the natural and historic resources of the national recreation area would capture the essence of this

concept. These wayside exhibits would provide information similar to that available on a guided tour, but would not require staff to lead tours.

Permanent Buildings—The NPS considered constructing various structures, such as a ranger station, in Rosita Flats. Because the area is in a regulated floodplain, which does not allow permanent building construction, any structure for fee collection, interpretation, law enforcement, or other uses was considered but dismissed from further analysis.

Banning Night Driving—The NPS considered banning night driving to reduce noise and the potential for illegal activities in ORV use areas. Because many people camp in the ORV use areas, a ban is not feasible because people need to be able to travel to and from the campground. Therefore, this element was considered but not carried forward for analysis. However, this concept was addressed by including restricted ORV use in designated camping areas between 10:00 p.m. and 6:00 a.m. (to create quiet hours).

Alternative Transportation—The NPS considered providing alternative transportation in the ORV use areas, such as a shuttle for visitors. The national recreation area is a multiple-use area lending itself to visitors bringing in cooking, camping, and recreational equipment, which would be difficult with a shuttle or other form of alternative transportation. Also, visitors access the national recreation area from many different areas, making it difficult to identify effective pickup points for this type of use. For these reasons, the element of instituting an alternative transportation system was considered, but not carried forward for further analysis.

Maintaining and Building Roads—The NPS considered additional road maintenance projects, such as maintaining the road to Blue Creek for trailer access and paving other roads in the ORV use areas. This concept was considered but not carried forward for further analysis because building and maintenance of roads is beyond the scope of this plan, which is to address how ORVs are managed in the national recreation area. Further, road paving cannot occur at Rosita Flats, as suggested by one commenter, because the area is located in a floodplain and building roads in these areas is discouraged by NPS policy and other regulations.

Creating Winch Points—The NPS considered creating new winch points in the national recreation area. In the past, national recreation area staff established winch points in other areas, such as Mullinaw Crossing; however, frequent river shifts at these locations make such improvements unusable. Because Rosita Flats and Blue Creek may have similar issues, it was determined that new winch points would likely experience similar shifts and would become unusable. Because of these shifts the NPS determined that national recreation area resources would be better directed to other projects for the ORV plan. Because of these factors, this element was considered but not carried forward for further analysis.

Installing Lighting in Camping Areas—During public scoping, one commenter requested installation of lighting in the camping areas. Although this may be a convenience for visitors, Section 4.10 of NPS *Management Policies 2006* directs parks to “preserve, to the greatest extent possible, the natural lightscapes of parks, which are natural resources and values that exist in the absence of human-caused light” and to prevent the loss of darkness in national park units. Because NPS policy directs minimal use of lighting, this element was considered but not carried forward for further analysis.

Adding Air Quality Mitigation Measures—During public review of the draft plan/EIS, one commenter suggested that the plan should include air quality mitigation measures such as separation of uses, planned ORV routes, and suspension of ORV use during high wind events. While it has been documented that ORV use contributes to increased atmospheric particulate matter levels in the form of fugitive dust (WESTEC 1979), subtle meteorological dispersion effects in the Texas panhandle are such that these impacts are unlikely to present significant threats to human health. Stable thermal stratification allows

large dust particles to settle out of the air quickly, while allowing smaller particles to remain suspended and presenting potential health risks to sensitive receptors (WESTEC 1979). Atmospheric conditions in the vicinity of Lake Meredith National Recreation Area are characterized by consistent winds of varying speeds. High winds send dust higher into the atmosphere where the dust is dispersed to the surrounding area, away from potential receptors in the area (WESTEC 1979).

The preferred alternative presented in the draft plan/EIS includes many of the air quality elements requested by the commenter. Separation of visitor use under the preferred alternative will be achieved though a zone system and designated routes and areas will be established. The NPS considered suspension of ORV use during excessive wind events, but due to the unpredictable, sporadic, and brief nature of the events in the area, implementation would not be practical. High wind events in the area usually occur quickly and last for a short period, making it difficult to monitor these events and determine when to close areas due to high winds. Wind events can last for a brief period, which would result in the event being over before a closure could be put into place (WESTEC 1979). For these reasons, this element was considered, but not incorporated into the preferred alternative.

No Set Speed Limits, Except around Camping Areas—Objectives of this plan include managing ORV use to minimize conflicts among different ORV users and promoting safe operation of ORVs and safety of all visitors. Within the range of alternatives, the NPS has chosen to include speed limits in certain areas to increase safety and meet these plan objectives.

Designate Motorcycle Only Trails, as well as Trails for Other Specific Uses—Currently, and under all alternatives, there are narrow routes that lend themselves to motorcycle use. These routes are located in Rosita Flats, east of Bull Taco Hill in the floodplain, just outside of the river. Under all alternatives, these routes would still be available and most conducive to motorcycle use; however, they would not be explicitly designated as motorcycle only trails. In regards to other designated trails for specific vehicle types, the NPS believes that due to the variety of trails available, some are more suitable for certain types of vehicles than others, and official designation of these trails for one type of vehicle is not necessary at this time.

CONSISTENCY WITH THE PURPOSES OF NATIONAL ENVIRONMENTAL POLICY ACT

The NPS requirements for implementing the NEPA include an analysis of how each alternative meets or achieves the purposes of the NEPA, as stated in Sections 101(b) and 102(1). CEQ Regulation 1500.2 establishes policy for federal agencies' implementation of NEPA. According to this regulation federal agencies shall, to the fullest extent possible, interpret and administer the policies, regulations, and public laws of the United States in accordance with the policies set forth in NEPA (Sections 101(b) and 102(1)); therefore, other acts and NPS policies are referenced as applicable in the following discussion.

1. *Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.*

   All the alternatives proposed would manage ORV use in the national recreation area, but the management tools would vary. Alternative A would not meet natural and cultural resource–related objectives because no ORV routes or areas would be established and ORV use would be allowed to occur anywhere in Blue Creek and Rosita Flats. This use would continue to cause damage to the soils and result in impacts on the natural and cultural resources in this area. Alternative A would not meet the purpose of fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations by allowing this level of use to continue in the national recreation area.

Alternatives B, C, and D would continue to allow ORV use in the national recreation area, but would implement additional management measures to minimize impacts from ORV use on national recreation area resources. All the action alternatives would, at a minimum, establish routes and areas for ORV use in Blue Creek and Rosita Flats that would be clearly marked with carsonite posts or post-and-cable fencing. By establishing these routes and areas, restoration to natural conditions would begin in areas excluded from ORV use. Although all the action alternatives would include ORV routes and areas, these alternatives (B, C, and D) would meet this purpose because management measures would be implemented that include zones to protect resources and reduce visitor conflicts (alternatives B and D), fee permit systems that have an educational component (alternatives C and D), and the possibility of a use limit (alternative C). Because of these additional management measures, alternatives B, C, and D would meet this purpose, but not fully, because ORV use would continue in these areas and some level of impact on national recreation area resources would also continue.

2. *Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.*

   All alternatives meet this purpose to some degree because the national recreation area is currently and would continue to be managed as a safe visitor destination. The action alternatives (alternatives B, C, and D) would increase safety by establishing ORV routes and areas, as well as implementing a glass bottle ban, establishing speed limits in the ORV use areas, and increasing the education and outreach in the national recreation area. Additionally, new vehicle requirements under the action alternatives would contribute to increased safety by including flags and helmets and would improve soundscape conditions by decreasing decibel levels during ORV operation. With the additional safety measures in place, alternatives B, C, and D would meet this purpose.

3. *Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.*

   All the alternatives offer a wide range of visitor use opportunities in the two ORV use areas. It is expected under all alternatives that existing recreation opportunities would continue to be offered and all uses currently occurring would remain at current levels. As discussed above under purposes 1 and 2, although the level of access and opportunities would be similar, the impact each of the alternatives on national recreation area resources would differ. Risks to the health and safety of visitors and the potential degradation of resources due to unmanaged ORV use prevents alternative A from achieving this purpose. Establishing ORV routes and areas and managing ORV use would reduce this degradation and meet this purpose to some degree. Alternatives B, C, and D would offer further management measures (described above), allowing for current levels of use, but with less impact on the national recreation area's resources, meeting this purpose.

4. *Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.*

   Because none of the alternatives would result in adverse impacts on cultural or historic resources that would exceed minor (except for archeology), these topics were dismissed from further analysis in this plan/EIS. Overall, because any adverse impacts on cultural or historic resources (except archeology) would not exceed minor, all alternatives would preserve important historic and cultural aspects of our national heritage in the long term and would meet this purpose to a large degree. In addition, the action alternatives would establish routes and areas for ORV use. These routes and areas would be marked and use outside these routes and areas would not be allowed. Requiring users to stay on designated routes would minimize any contact with the national recreation area's archeological resources in the ORV use areas and would meet this purpose to a large degree. Alternative A would not designate ORV routes and areas. Without designated routes and areas, ORV use would continue to impact the national recreation area

resources, including soils, water quality, and wildlife and wildlife habitat, among others. Because these impacts would continue to occur, this purpose would not be met under the no-action alternative.

Alternatives that include additional management measures (alternatives B, C, and D) would meet this purpose for natural resources, as discussed under purposes 1 and 2. All the action alternatives would establish similar routes and areas and allow for the uses that are currently occurring, all supporting diversity and variety of individual choice (to a large degree).

5. *Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.*

   Balancing population and resource use under this plan/EIS would include protecting the resources unimpaired for the enjoyment of present and future generations and providing access for visitors to experience the natural resources of the national recreation area. NPS *Management Policies 2006* states that the enjoyment contemplated by the Organic Act is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment and inspiration. Congress, recognizing that enjoyment of national parks by future generations can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant.

   For all alternatives visitors would continue to have opportunities to enjoy the national recreation area. As discussed above, alternatives B, C, and D would provide for ORV use in the national recreation area, with management measures (zoning, fee-permit systems, and additional education and outreach) that would provide a level of protection to the national recreation area's resources to allow for their future enjoyment. Alternatives B, C, and D would meet this purpose. Alternative A would meet the purpose because the public would be provided access to the amenities in the national recreation area, but management measures under the no-action alternative may not offer the same level of protection to natural resources as under the action alternatives.

6. *Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.*

   For the reasons discussed above, the action alternatives (alternatives B, C, and D) would enhance the quality of the national recreation area's biological and physical resources through the implementation of additional ORV management measures. The second purpose, "approach the maximum attainable recycling of depletable resources," is less relevant to an ORV management plan because it is geared toward a discussion of "green" building or management practices. There would be no construction related to any of the alternatives, so this purpose would not apply.

   However, as discussed in chapter 1 of this document, each of the alternatives would require that the national recreation area continue to operate under the wise energy use guidelines and requirements stated in the NPS *Management Policies 2006*; Executive Order 13123, "Greening the Government through Effective Energy Management"; Executive Order 13031, "Federal Alternative-Fueled Vehicle Leadership"; Executive Order 13149, "Greening the Government through Federal Fleet and Transportation Efficiency"; and the 1993 NPS *Guiding Principles of Sustainable Design*. Therefore, all alternatives would meet this purpose.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The NPS is required to identify the environmentally preferable alternative in its NEPA documents for public review and comment. The NPS, in accordance with the NEPA Regulations (43 CFR 46) and CEQ's *Forty Questions*, defines the environmentally preferable alternative (or alternatives) as the alternative that best promotes the national environmental policy expressed in NEPA (Section 101[b]) (516 DM 4.10). The CEQ's *Forty Questions* (Q6a) further clarifies the identification of the environmentally preferable alternative, stating, "this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources."

The NPS, in accordance with the NEPA Regulations (43 CFR Part 46) and CEQ's Forty Questions*, defines the environmentally preferable alternative (or alternatives) as the alternative that best promotes the national environmental policy expressed in NEPA (Section 101(b)) (516 DM 4.10).*

Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas. This alternative was identified as the environmentally preferable alternative because it establishes numerous management measures that would reduce the impact of ORV use on the landscape in both Blue Creek and Rosita Flats. These measures include the following:

- The establishment of ORV routes and areas in either sand bottom areas (Blue Creek) or on already disturbed trails. Routes and areas would be clearly marked so users would be better able to avoid unknowingly going off trail.
- The overlay of zones that would reduce the intensity of use in some areas (such as the resource protection zone). In these areas, restrictions on vehicle size would result in less damage to soils and provide a better opportunity for other resources, such as vegetation, to recover.
- Designated river crossings that would better protect Arkansas River shiner habitat in addition to restrictions that would prevent driving in isolated pools during times of drought.
- A permit system that would provide educational materials to users to keep them informed on how they can best use ORV use areas while at the same time promoting resource protection.

As noted in table 4, alternative D meets the objectives related to resources to a large degree based on the above elements. By meeting these objectives, alternative D would cause the least amount of damage to the biological and physical environment. The combination of designated routes, zoning, and a permit system in alternative D would better protect, preserve, and enhance historic, cultural, and natural resources in comparison to the other alternatives.

NATIONAL PARK SERVICE PREFERRED ALTERNATIVE

To identify the preferred alternative, the planning team held discussions based on CEQ guidance for implementing NEPA, which defines the agency's preferred alternative as that alternative "which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors" (CEQ 1981). The deliberations on the preferred alternative considered the purpose of the national recreation area, how well each alternative meets the objectives of the plan/EIS, and the impacts of each alternative.

Alternative A, on the whole, would not meet the majority of the objectives. Without designated ORV routes and areas, ORVs would be able to use Blue Creek and Rosita Flats unrestricted. This type of use would allow new trails to be created and allow for the further erosion of soils and damage to vegetation, and would not meet natural or cultural resource objectives. Under this alternative, no additional management measures would be implemented, such as zoning or permit systems, and objectives related to reducing visitor conflicts would not be met. Because many of the objectives of this plan would not be met, alternative A was not identified as the NPS-preferred alternative.

Alternatives B, C, and D would meet the objectives to a large degree, with some objectives being fully met under each of these alternatives. In regard to visitor use and safety, alternatives B and D would meet these objectives fully due to the establishment of zones that would separate visitor uses. Alternative D would further meet this objective by implementing a fee-permit system, with an educational component to further reduce visitor conflicts. The establishment of the fee-permit system under alternative C would meet these objectives to a large degree, but not as fully as B or D because no zoning system would be established. In terms of management objectives, alternative C would meet these two objectives to a large degree, because a use limit could be established based on desired resource conditions. This use limit would allow for the national recreation area to develop public awareness strategies to build park stewardship. Alternatives B and D would meet the objective for building stewardship to a moderate degree through the increased educational components (also included in alternative C). However, neither alternative B nor D would establish a use limit, and so would not meet that objective. Alternative D would best meet objectives related to natural and cultural resource protection by combining the establishment of designated routes and areas, zoning and/or permit systems, and increased visitor education. Alternatives B and C would partially meet cultural and natural resource protection objectives, but only D would implement the full range of ORV management options to improve resource conditions. For the national recreation area operations, alternatives C and D would fully meet the objective to minimize cost due to cost recovery through the permit system, with alternative B not meeting this objective because of the lack of cost recovery (no permit fees that would help pay for ORV management activities). All alternatives would identify costs of ORV management, but the permit fees in alternatives C and D would help meet these identified needs, fully meeting this objective. The lack of fees under alternative B would result in this alternative meeting this objective only to a large degree.

Because alternative D provides for a variety of management tools (designated routes and areas, zoning, permits with fees, and increased education), the NPS determined that this alternative, on the whole, best meets the objectives of this plan. Alternatives B and C would offer many of the same benefits as alternative D. However, because alternative D provides for the maximum management flexibility and greatest resource protection, it was identified as the preferred alternative rather than alternative B or C.

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TABLE 4: ANALYSIS OF HOW ALTERNATIVES MEET OBJECTIVES

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Visitor Use and Safety				
Manage ORV use to minimize conflicts among different ORV users.	Does not meet this objective because there would be no separation of uses (e.g., camping) in the ORV use areas, no established ORV routes, and no speed limits. Visitors with varying skills, interests, and expectations would use the areas together.	Fully meets this objective by establishing routes for ORV use in both Blue Creek and Rosita Flats. Camping-only zones would be designated, with reduced ORV speed. Low-speed and beginner zones would also be designated to provide areas for riders of specific skill levels. Recreational ORV use would be prohibited during hunting season. These options would separate users, allow increased variety of ORV use, and eliminate the recreational ORV / hunting conflict; a revocable ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts.	Meets this objective to a large degree by designating ORV routes in both Blue Creek and Rosita Flats. Establishes designated camping areas, improves visitor amenities, and could provide "camp hosts" to assist visitors. An ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts. If conditions warrant, a use limit could be implemented.	Fully meets this objective by establishing routes for ORV use in both Blue Creek and Rosita Flats. Camping-only zones would be designated, with reduced ORV speeds. Low-speed and beginner zones would also be designated to provide areas for riders of specific skill levels. Recreational ORV use would be prohibited during hunting season. These options would separate users, allow increased variety of ORV use, and eliminate the recreational ORV / hunting conflict; a revocable ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts. In addition, an ORV permit would increase NPS ability to manage for inappropriate use, and could result in reduced visitor conflict.
Promote the safe operation of ORVs and safety of all visitors.	Meets this objective to some degree by requiring standard rider protection, Texas safety certification, and parental presence for young riders. However, alternative A would not implement speed limits, riders of varying skill level would not be separated, and there would be no requirements for safety items on ORVs.	Fully meets this objective by implementing measures common to alternatives B, C, and D, separating users of various skill levels, establishing speed limits and use zones, and requiring safety items on ORVs and riders. Camping and riding areas would be separated, and recreational ORV use would not be allowed in hunting areas during hunting season; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area.	Meets this objective to a large degree by implementing measures common to alternatives B, C, and D; camping and riding areas would be separated; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area; and visitor capacity could be established if conditions warrant.	Fully meets this objective by implementing measures common to alternatives B, C, and D; separating users of various skill levels; establishing speed limits and use zones; and requiring safety items on ORVs and riders. Camping and riding areas would be separated, and recreational ORV use would not be allowed in hunting areas during hunting season; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area.
Management				
Build stewardship through public awareness and understanding of NPS resource management and visitor use policy and responsibilities as they pertain to the national recreation area and ORV management.	Meets this objective to some degree by continuing NPS education, interpretation, and enforcement in the ORV use areas.	Meets this objective to a moderate degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. Establishes resource protection zones that would reduce impacts on vegetation and soils and fence ORV use areas, which would reduce impacts on wildlife.	Meets this objective to a large degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. The implementation of a permit system with an educational emphasis would also promote further understanding of national recreation area resources.	Meets this objective to a large degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. The implementation of a permit system with an educational emphasis would also promote further understanding of national recreation area resources.
Natural Resources				
Minimize adverse impacts on threatened, endangered, and other protected species and their habitats.	Does not meet this objective because formal plans to reduce direct and indirect impacts on the Arkansas River shiner and its habitat would not be implemented.	Meets this objective to a large degree by establishing resource protection zones that would reduce impacts on vegetation and soils, indirectly benefiting the Arkansas River shiner by reducing erosion and impacts on water quality and through implementation of the measures outlined in the biological opinion. Restricting ORV traffic from isolated pools of water during drought would reduce direct impacts on the Arkansas River shiner and its habitat.	Meets this objective to a large degree by allowing ORV travel only on sandy bottoms and designated routes in Blue Creek and confining ORVs to denuded areas and designated routes in Rosita Flats. Would establish a use limit based on desired conditions for resources (including threatened and endangered) to be identified in ongoing GMP process and would implement species protection measures outlined in the biological opinion.	Meets this objective to a large degree by establishing resource protection zones that would reduce impacts on vegetation and soils, indirectly benefiting the Arkansas River shiner by reducing erosion and impacts on water quality and through implementation of the measures outlined in the biological opinion. Restricting ORV traffic from isolated pools of water during drought would reduce direct impacts on the Arkansas River shiner and its habitat.
Define effective strategies for soil erosion control and the restoration of plant resources to support wildlife populations.	Does not meet this objective because no formal plans to reduce erosion or impacts on vegetation would be established.	Meets this objective to a moderate degree by establishing resource protection zones, designating routes for a variety of ORV uses, restricting ORVs from vegetated areas, and clearly marking areas where ORV use is allowed.	Meets this objective to a moderate degree by allowing ORV travel only on sandy bottoms and designated routes in Blue Creek and confining ORVs to denuded areas and designated routes in Rosita Flats. Would establish a use limit based on desired conditions for resources to be identified in ongoing GMP process.	Meets this objective to a moderate degree by establishing resource protection zones, designating routes for a variety of ORV uses, restricting ORV from vegetated areas, and clearly marking areas where ORV use is allowed.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
National Recreation Area Operations				
Identify ORV plan implementation needs and costs.	Meets objective to a large degree. Through the ORV planning process, all costs for plan implementation would be identified.	Meets objective to a large degree. Through the ORV planning process, all costs for plan implementation would be identified.	Fully meets this objective. Through the ORV planning process, all costs for plan implementation would be identified. In addition, a fee-permit system would allow for a level of cost recovery for administering ORV management at the national recreation area.	Fully meets this objective. Through the ORV planning process, all costs for plan implementation would be identified. In addition, a fee permit system would allow for a level of cost recovery for administering ORV management at the national recreation area.
Minimize national recreation area operations and cost impacts as the result of implementing an ORV plan.	Does not meet this objective because ORV users would not pay fees to support services or restore damage done by ORV use.	Does not meet this objective because ORV users would not pay fees to support services or restore damage done by ORV use.	Meets this objective to a large degree by implementing a fee structure to cover costs of ORV visitor amenities, resource monitoring, and restoration needs associated with ORV use.	Fully meets this objective by implementing a fee structure to cover costs of ORV visitor amenities, resource monitoring, and restoration needs associated with ORV use.

TABLE 5: ENVIRONMENTAL IMPACT SUMMARY BY ALTERNATIVE

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Soils	Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized major adverse impacts on soils. Incremental contributions to soil erosion would be most notable at the extreme edges of the cutbanks and the eastern extent of the Blue Creek ORV use area and at the edges of the Rosita Flats ORV use area. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term major adverse impacts of alternative A, would result in long-term moderate adverse cumulative impacts on soil resources.	Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from educational measures provide increased awareness and behavior modification among ORV users. Incremental contributions to soil erosion would result from the intensification of uses in certain areas, such as the proposed beginner zone and designated camping areas, and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative B, would result in long-term moderate adverse cumulative impacts on soils.	Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in localized long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses at certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in-only camping. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative C, would result in long-term moderate adverse cumulative impacts on soils.	Under alternative D, continued ORV use and management at Blue Creek and Rosita Flats would result in localized long-term minor to moderate impacts. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses in certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of no-camping zones around vegetated areas. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term minor to moderate adverse impacts of alternative D, would result in long-term minor to moderate adverse cumulative impacts on soils.
Vegetation	Localized short- and long-term moderate adverse effects on vegetation would occur under alternative A as a result of localized impacts, including damage to plants; erosion, which can result in further loss of vegetation; reduction in soil productivity, which can affect natural recovery; and the potential introduction or spread of nonnative plants. The parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the localized short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in localized long-term moderate adverse cumulative impacts on vegetation.	Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. These adverse impacts would occur in fewer vegetated areas under alternative B because more of the land would be closed to ORVs compared to under alternative A. The designation of ORV routes and areas would allow previously disturbed vegetated areas the opportunity to recover. As a result, there would be long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.	Localized short- and long-term minor adverse impacts on vegetation would occur in areas open to ORV use. However, there would be impacts in fewer vegetated areas because several areas would be closed to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.	Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. However, impacts would occur in fewer vegetated areas because only designated routes and specific areas would be open to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.
Water Resources	Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized moderate adverse impacts on water quality due to ongoing disturbances under current management that would continue to impact surface water quality in the ORV use areas. Sedimentation of surface waters in Lake Meredith would continue to result from the ongoing erosion of soils due to ORV use. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative A, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor to moderate adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in short- to long-term localized minor to moderate adverse impacts on water resources. Impacts on water quality would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in -only camping. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative D, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be offset by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on water resources.
Soundscapes and the Acoustic Environment	The effects of alternative A on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative A on soundscapes at Rosita Flats would be long term, moderate, and adverse. Cumulative impacts on soundscapes would be long term, minor to moderate, and adverse.	The effects of alternative B on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative B on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.	The effects of alternative C on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative C on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.	The effects of alternative D on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative D on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Wildlife and Wildlife Habitat	Localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat would result from species disturbance and displacement, habitat damage and fragmentation, and individual mortality. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to continued use of ORVs in the Rosita Flats and Blue Creek ORV use areas, impacts would be less than under alternative A as a result of increased resource management. The use of a zone system, including a resource protection zone, as well as restrictions on driving in isolated pools in times of drought, designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Therefore, overall impacts under alternative B would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to the continued use of ORVs in the Blue Creek and Rosita Flats ORV use areas, the impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative C. The development of a monitoring plan and interpretive wayside program, the implementation of use limits and permitting system, the designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term minor adverse impacts of alternative C, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although the continued use of ORVs at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat, impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative D. The implementation of a zoning system and fee-based permitting system, as well as the enactment of resource protection rules, such as the headlight/taillight and muffler requirements and the prohibition on driving on vegetation, would result in long-term beneficial impacts on wildlife and wildlife habitat at the Blue Creek and Rosita Flats ORV use areas. Additional beneficial impacts would result from prohibitions on driving through isolated pools, establishing designed access point to the river, and implementing protection measures for the Arkansas River shiner (which would also benefit other species). Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor adverse impacts under alternative D, would result in long-term minor adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.
Threatened and Endangered Species / Species of Concern	Under alternative A, short- and long-term moderate adverse effects on the Arkansas River shiner could occur as a result of localized impacts including disturbance, mortality, or damage to/loss of habitat. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse cumulative impacts on the Arkansas River shiner.	Short- and long-term moderate adverse impacts on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the use of a zone system, including a resource protection zone, as well as designating ORV access points at the riverbed and restrictions on driving in isolated pools in times of drought, and the other protection measures outlined in the biological opinion would help mitigate these adverse impacts on Arkansas River shiner habitat. Therefore, overall impacts under alternative B would be short and long term, minor to moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.	Short- and long-term moderate adverse effects on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the implementation of use limits, a fee-based permit system, the designation of ORV access points at the riverbed, and increased resource management, as well as other protection measures resulting from the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the Arkansas River shiner and its associated habitat. Therefore, the overall impacts of implementing alternative C would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.	Although the continued use of ORVs at Rosita Flats would result in short- and long-term moderate adverse impacts on the Arkansas River shiner in localized areas, impacts would be less than under alternative A due to increased resource management which would result in long-term beneficial impacts, but there would be long-term minor adverse impacts. The implementation of a zoning system and fee-based permit system as well as the resource protection measures that would be implemented as part of the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the shiner at Rosita Flats. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor to moderate adverse impacts under alternative D, would result in long-term minor to moderate adverse impacts on the Arkansas River shiner.
Archeological Resources	Alternative A would result in continued potential long-term major adverse impacts on archeological resources along or near open ORV use areas, routes, or access points. Cumulative impacts would be long term, major, and adverse.	Alternative B would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Measures would be implemented to restrict access to the sensitive areas. Cumulative impacts would be long term, minor to moderate, and adverse.	Alternative C would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points; where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.	Alternative D would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Visitor Use and Experience / Health and Safety	Under alternative A there would be no change to the current visitor use and experience, access, or recreational opportunities. The current safety risk of unregulated ORV use in the national recreation area would remain the same. As a result, impacts on visitor use and experience / health and safety would be long term, moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the long-term moderate adverse impacts under alternative A, would result in long-term minor to moderate adverse cumulative impacts on visitor use and experience / health and safety.	Although the establishment of zones and the implementation of a permit system would have adverse impacts for the majority of visitors by requiring visitors to obtain an ORV permit, beneficial impacts would result from the separation of visitor uses, improved safety, and enhanced resource conditions at the national recreation area. A minority of users would experience moderate adverse effects by loss of access to the resource protection zone and temporary loss of the hunting zone in Rosita Flats. Some users could experience long-term negligible to minor adverse impacts because the potential for user conflicts may arise with hunters not using ORVs in the hunting zone. Overall, impacts under alternative B would be long term, minor to moderate, and adverse as well as long term and beneficial for ORV users at the national recreation area. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.	The proposed permit fee, while being an additional cost to visitors, would create more visitor amenities that would enhance visitor use and experience at the national recreation area. Additionally, a greater presence of law enforcement, as well as the rangers' ability to revoke ORV permits, may cause visitor violations and illegal activity to decrease. As a result, impacts under alternative C would be long term, minor, and adverse, because users would need to adjust to a user fee, as well as long term and beneficial from enhanced safety and additional amenities, ORV rules, and education. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.	The proposed permit fee, while being an additional cost to visitors, would fund more visitor amenities that would enhance visit use and experience at the national recreation area. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease, which would have beneficial effects on visitor health and safety. Additionally, the establishment of zones and implementation of a permit system would have beneficial impacts for the majority of visitors by separating uses, implementing rules (speed limits, headlights, and orange flags for ATVs), education, improving safety, and enhancing resource conditions at the national recreation area. Overall, impacts under alternative D would be long term, minor to moderate, and adverse, because users would need to adjust to a user fee and a zoning system, and long term and beneficial due to improvements to visitor use and experience / health and safety. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative D, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.
Lake Meredith National Recreation Area Management and Operations	Staffing and funding levels would continue at the same levels as currently managed. The total approximate cost of implementing alternative A would be $315,000. Actions under alternative A would result in long-term negligible adverse impacts because there would be no noticeable change in national recreation area management and operations. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative A, would result in parkwide long-term negligible to minor adverse impacts on national recreation area management and operations.	The implementation of alternative B would require additional efforts from park staff. Law enforcement staff levels would be increased to ensure compliance with the additional regulations under alternative B. Additionally, there would be an increase in responsibilities for the interpretation and resource management staff. The total approximate cost of implementing alternative B would be $1,775,000. The implementation of alternative B would result in long-term minor to moderate adverse impacts on national recreation area management and operations, with impacts more moderate than minor because a fee permit system would not be in place to help offset additional expenses. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative B, would result in long-term minor to moderate adverse impacts.	The implementation of alternative C would require additional efforts from national recreation area staff in the areas of law enforcement, resource management, interpretation, and facilities management, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative C would be $442,500 and would be offset, in part, by money collected in the proposed fee system. The implementation of alternative C would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative C, would result in long-term minor to moderate adverse cumulative impacts.	The implementation of alternative D would require additional efforts from park staff in the area of law enforcement, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative D would be $1,775,000. The implementation of alternative D would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative D, would result in long-term minor to moderate adverse cumulative impacts.

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Affected Environment

CHAPTER 3

CHAPTER 3: AFFECTED ENVIRONMENT

The "Affected Environment" describes existing conditions for those elements of the natural and cultural environments that would be affected by implementing the actions considered in this plan/EIS. Because ORV use occurs in two distinct areas of Lake Meredith National Recreation Area, management actions proposed in this plan/EIS would only be applied to these areas of the national recreation area. Therefore, the discussion of the affected environment is limited to only those resources that may be affected by actions taken in Rosita Flats or Blue Creek. The following topics were addressed for the affected environment: soils, vegetation, water resources, wildlife and wildlife habitat, threatened and endangered species / species of concern, archeological resources, visitor use and experience / health and safety, and Lake Meredith National Recreation Area management and operations.

The "Affected Environment" describes existing conditions for those elements of the natural and cultural environments that would be affected by implementing the actions considered in this plan/EIS.

SOILS

In the current location of the national recreation area, the Canadian River has carved a narrow, steep-walled canyon from 200 to 300 feet deep and up to 2 miles wide. Between this canyon and the caprock, many tributary streams have caused a rough and broken topography known as the Canadian River Breaks. The construction of Sanford Dam between these "breaks" created Lake Meredith.

Over 67 percent of the land base of the national recreation area is composed of slopes greater than or equal to 12 percent. Problems associated with soils in the Lake Meredith National Recreation Area are generally related to soil texture (grain size) and slope. Unvegetated areas are subject to erosion by wind and water. In the national recreation area, soil compaction, erosion, and slumping occurs along roads, where vegetation cover is sparse, and on steep slopes. These areas are especially prone to erosion from surface runoff during storms. Accelerated erosion is more prevalent on steeper slopes and other disturbed areas, particularly where vegetation has been removed and cut-and-fill activities have occurred (NPS 2002a). These areas would be more highly susceptible to soil-surface disturbance, such as ORV use. Concerns related to increased erosion of soils include sediment delivery to streams and other water bodies, which decreases water quality.

Soils present at Lake Meredith National Recreation Area are described in detail for each of the two management areas. The discussion provides a description of soil associations and their respective erodibility factor ("K factor"). K factor is a measure of the soil's susceptibility to erosion. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment (or erosion). Coarse-textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff, even though these soils are easily detached. Medium-textured soils, such as the silt loam soils, have moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are the most erodible of all soils. They are easily detached and tend to crust and produce high rates of runoff. Values of K for these soils tend to be greater than 0.4 (Institute of Water Research 2009).

K factor is a measure of the susceptibility of soil to erosion.

BLUE CREEK

Typical Soils and Vegetation in Blue Creek

The soils at the Blue Creek ORV use area remain in better condition than at Rosita Flats due to greater ranger presence and the rangers' ability to control ORV impacts on hillsides and slopes. Aside from rough broken land, soils present in the current extent of ORV boundaries in the Blue Creek area include Enterprise and Riverwash (NRCS 2009). These soils and their associated erodibility are further described in table 6 and shown on figure 12. Enterprise has the largest K factor at 0.43, and thus is the soil with the most potential to be eroded. Rough broken land in the Blue Creek area has a K factor of 0.37, and riverwash has a K factor of 0.17. Based on these definitions, Blue Creek is composed mostly of soils that are well drained with moderate to high K factors. In the Blue Creek ORV use area, soils highly susceptible to erosion (i.e., with K factors greater than 0.4) compose approximately 0.62 acres, or 0.2 percent of the total area.

TABLE 6: SOIL TYPES AND ACREAGES IN THE BLUE CREEK OFF-ROAD VEHICLE USE AREA

Soil Association	Soil Series	Description	K Factor	Acres in ORV Use Area
Enterprise very fine sandy loam, 5% to 8% slopes	Enterprise	Very deep, well-drained, moderately rapidly permeable soils that formed in loamy eolian sediments. These soils are on nearly level to moderately steep plains on terrace pediments in the Central Rolling Red Plains. Slopes range from 0% to 20%.	0.43 (high)	0.62
Riverwash	Riverwash	Riverwash describes excessively drained alluvium soil or sediments deposited by a river or other running water. Alluvium is typically made up of a variety of materials, including fine particles of silt and clay and larger particles of sand and gravel. Riverwash has a representative slope value of 1%.	0.17 (low)	83.32
Rough broken land	Rough broken land	Rough broken land describes well-drained colluvium; loose bodies of sediment deposited or built up at the bottom of a low-grade slope or against a barrier on that slope, transported by gravity. Rough broken land has a representative slope value of 50%.	0.37 (moderate)	167.99
Water	Water	NA	NA	23.07

Source: NRCS 2009.

Notes:

Acreage of soils in Blue Creek ORV Use Area with *high* erodibility factors:	0.62
Acreage of soils in Blue Creek ORV Use Area with *moderate* erodibility factors:	167.99
Acreage of soils in Blue Creek ORV Use Area with *low* erodibility factors:	83.32

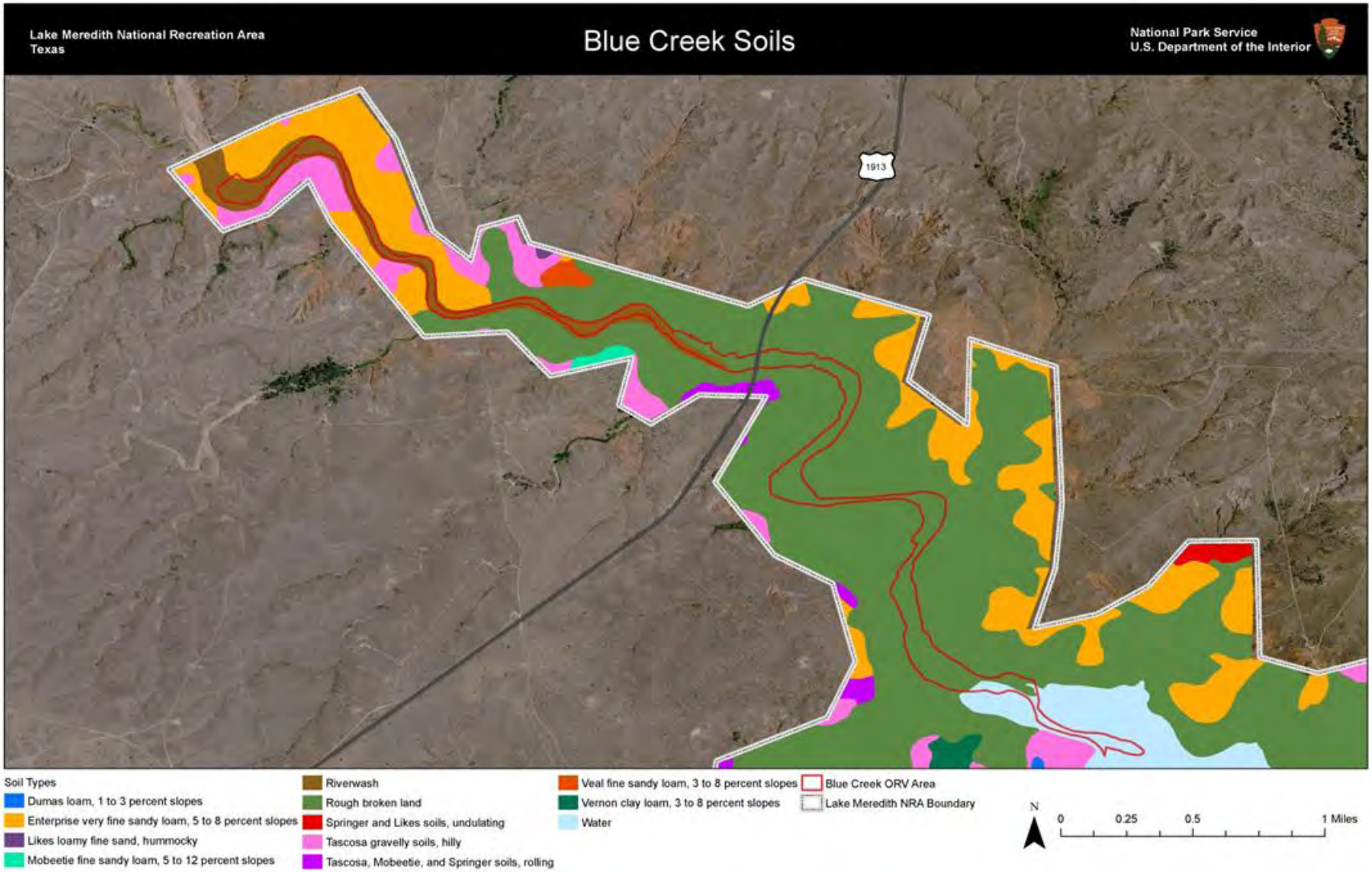


FIGURE 12: SOIL TYPES IN BLUE CREEK OFF-ROAD VEHICLE USE AREA

ROSITA FLATS

As described in chapter 1, soil erosion from ORV use has occurred and continues to occur in the designated area of Rosita, particularly between the entrance and Bull Taco Hill. Extensive soil erosion has occurred over the last 40 years, primarily due to the use of ORVs above the 3,000-foot elevation contour. On hillsides with slopes of 15 degrees or more, the soils often erode during and after rainfall events because of the steep slopes combined with the removal of vegetation by ORV use. These soils and their associated erodibility are further described in table 7 and shown on figure 13.

Example of Steep Slopes and Soils Erosion in Rosita Flats

Soils series present in the current extent of the ORV use area in Rosita Flats include Aspermont, Enterprise, Burson, Quinlan, Clairemont, Likes, Lincoln, Mobeetie, Riverwash, Tascosa, Tivoli, Weymouth, Vernon, and Yomont (NRCS 2009). As presented in table 7, Yomont association soil has the largest K factor, at 0.49, and thus has the most potential to be eroded; Clairemont soils have a K factor of 0.43; Aspermont–Enterprise and Burson–Quinlan–Rock outcrop associations have a K factor of 0.37, steep; and remaining soils and associations found in Rosita Flats have K factors between 0.15 and 0.32. These K factors, however, represent the soils in their natural condition. They do not indicate how past management or misuse of a soil increases soil erodibility. In those areas where the subsoil is exposed, the organic matter has been depleted, and/or the soil structure destroyed or soil compaction has reduced permeability, the K factor would increase regardless of soil type (Institute of Water Research 2009). Based on these definitions, Rosita Flats is composed mostly of well-drained, moderate-to-high K factor soils. In the Rosita Flats ORV use area, soils highly susceptible to erosion (i.e., with K factors greater than 0.4) compose approximately 126 acres, or 7 percent of the total area.

TABLE 7: SOIL TYPES AND ACREAGES IN THE ROSITA FLATS OFF-ROAD VEHICLE USE AREA

Soil Association	Soil Series	Description	K Factor	Acres in ORV Use Area
Aspermont–Enterprise association, undulating	Aspermont	Deep, well-drained, moderately slow or moderately permeable soils. These soils formed in calcareous silty colluvium over redbed siltstone and claystone of Permian age. These very gently sloping to steep soils are on sideslopes or summits on uplands. Slope ranges from 1% to 25%.	0.37 (moderate)	22.10
	Enterprise	Very deep, well-drained, moderately rapidly permeable soils that formed in loamy eolian sediments. These soils are on nearly level to moderately steep plains on terrace pediments in the Central Rolling Red Plains. Slopes range from 0% to 20%.		

Soil Association	Soil Series	Description	K Factor	Acres in ORV Use Area
Burson–Quinlan–Rock outcrop association, steep	Burson	Very shallow, well-drained, moderately permeable soils derived from loamy residuum from sandstones and siltstones of Triassic and/or Permian age. The soils are on gently sloping to very steep ridges, knolls, side slopes, and erosion remnants. Slope ranges from 3% to 80%.	0.37 (moderate)	60.54
	Quinlan	Shallow, well-drained, moderately rapid to moderately permeable soils that formed in loamy residuum weathered from noncemented, calcareous sandstone bedrock of Permian age. These soils are on nearly level to steep ridges and escarpments in the Central Rolling Red Plains. Slope ranges from 1% to 50%.		
Clairemont silty clay loam, occasionally flooded	Clairemont	Very deep, well-drained, moderately permeable soils that formed in calcareous silty alluvium. The soils are on nearly level flood plains of the Central Rolling Red Plains, Rolling Limestone Prairies, and the Central Prairies. Slopes range from 0% to 2%.	0.43 (high)	56.95
Likes loamy fine sand, 1% to 8% slopes	Likes	Very deep, excessively drained, rapidly permeable soils. These soils formed in sandy colluvium and alluvium derived from the Ogallala Formation of Miocene–Pliocene age. These soils are on very gently sloping valley flats or gently sloping to moderately steep valley sides. Slope ranges from 1% to 20%.	0.15 (low)	36.28
Lincoln soils, frequently flooded	Lincoln	Very deep, somewhat excessively drained, rapidly permeable floodplain soils that formed in sandy fluvial sediments of Recent age. These soils are on nearly level to undulating flood plains in the Central Rolling Red Plains and Southern High Plains Breaks. Slope ranges from 0% to 3%.	0.17 (low)	945.33
Mobeetie fine sandy loam, 5% to 12% slopes	Mobeetie	Very deep, well-drained, moderately rapidly permeable soils that formed in calcareous, sandy alluvium and colluvium derived from the Ogallala Formation of Miocene–Pliocene age. These soils are on nearly level to gently sloping valley flats or gently sloping to steep valley side or scarp. Slope ranges from 0% to 45%.	0.24 (moderate)	22.07
Riverwash	Riverwash	Riverwash describes excessively drained alluvium soil or sediments deposited by a river or other running water. Alluvium is typically made up of a variety of materials, including fine particles of silt and clay and larger particles of sand and gravel. Riverwash has a representative slope value of 1%.	0.17 (low)	457.67

Soil Association	Soil Series	Description	K Factor	Acres in ORV Use Area
Tascosa association, hilly	Tascosa	Deep, well-drained, moderately permeable soils that formed in sandy and gravelly alluvial sediments of the Ogallala Formation of Miocene-Pliocene age. These soils are on convex, gently sloping to steep knobs and erosional hillslopes in the Canadian Breaks and margins of the Southern High Plains. Slope ranges from 3% to 30%.	0.15 (low)	4.59
Tivoli fine sand	Tivoli	Very deep, excessively drained, rapidly permeable soils that formed in sandy eolian sediments. These soils are on undulating to hummocky sand dunes on stream terraces in the Central Rolling Red Plains and the Southern High Plains Breaks. Water runs off the surface very slowly. Slopes are complex and are 1% to 45%.	0.15 (low)	38.54
Weymouth–Vernon association, undulating	Weymouth	Weymouth series comprises deep, well-drained, moderately permeable upland soils. These soils formed in clayey shales. Slopes range from 1% to 12%.	0.32 (moderate)	27.20
	Vernon	Moderately deep over claystone bedrock, well-drained, very slowly permeable soils that formed in residuum over noncemented claystone bedrock or dense clay of Permian age. These soils are on gently sloping to steep plains and escarpments of the Central Rolling Red Plains, Central Limestone Prairies and North Central Prairie. Slopes range from 1% to 45%.		
Yomont soils, frequently flooded	Yomont	Very deep, well-drained, moderately rapidly permeable soils that formed in calcareous loamy alluvial sediments of Permian age redbeds. These soils are on nearly level flood plains of the Central Rolling Red Plains. Slopes range from 0% to 2%.	0.49 (high)	68.73

Source: NRCS 2009.

Notes:

Acreage of soils in Rosita Flats ORV Use Area with *high* erodibility factors: 125.68

Acreage of soils in Rosita Flats ORV Use Area with *moderate* erodibility factors: 131.91

Acreage of soils in Rosita Flats ORV Use Area with *low* erodibility factors: 1,482.41

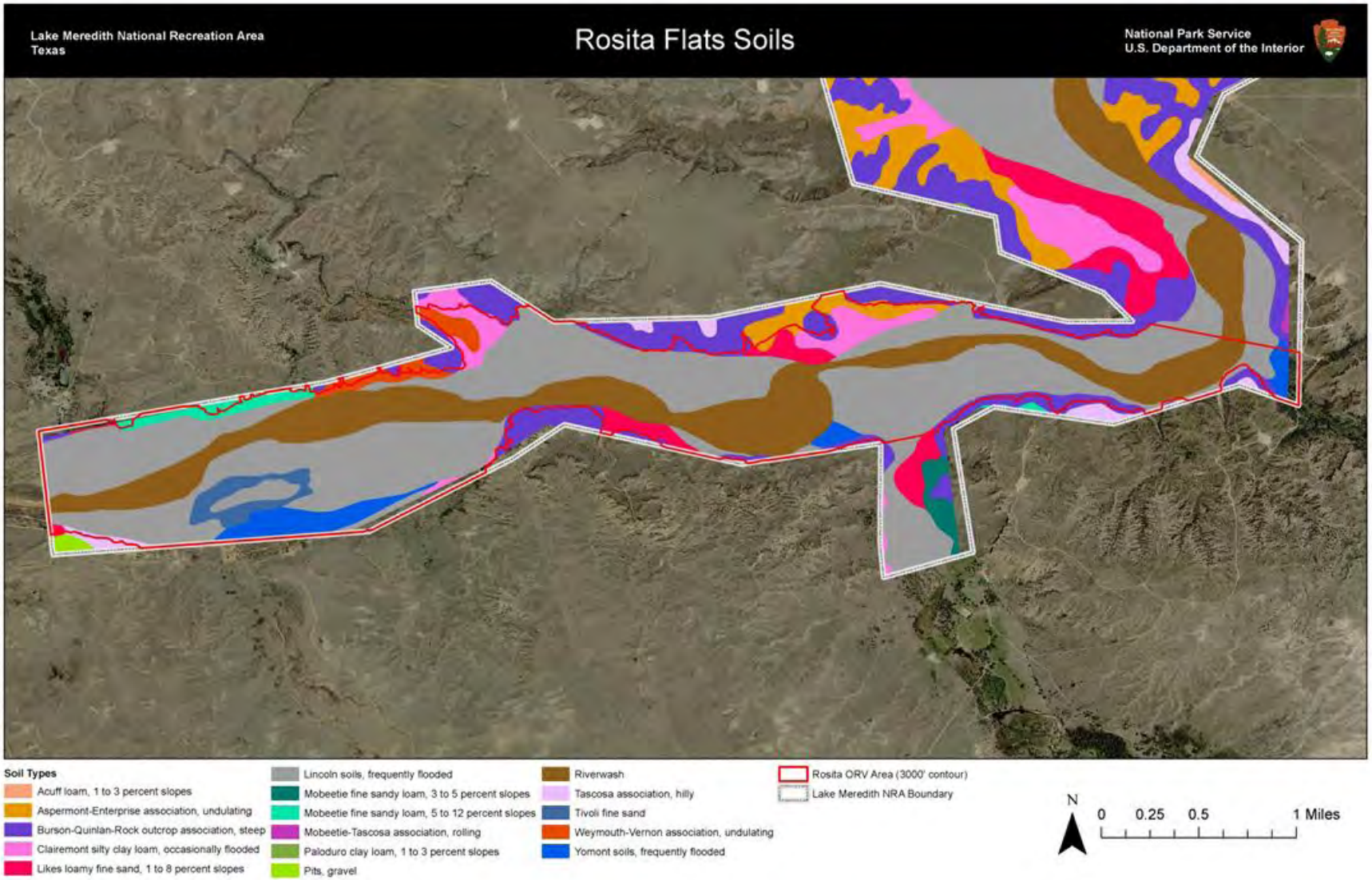


FIGURE 13: SOIL TYPES IN ROSITA FLATS OFF-ROAD VEHICLE USE AREA

VEGETATION

The vegetation of the national recreation area is relatively sparse, due to soil and climatic conditions, and consists primarily of grasses and drought-tolerant shrubs. In addition, stands of hackberry (*Celtis* spp.) and cottonwood trees (*Populus deltoides*) grow alongside canyons and riverbanks, and multiple other trees are found where they were previously planted around developed sites (NPS 1996). Although sparse, vegetation in the area is important to the overall health of the national recreation area and provides important habitat for wildlife. Vegetation also holds and traps blowing sediment, thereby preventing erosion, and is a primary factor in the national recreation area's visual quality and biodiversity.

Cottonwood Trees in Rosita Flats

Within the national recreation area, there are currently two areas (Blue Creek and Rosita Flats) designated for ORV use (which includes motorcycles, three- and four-wheelers, and dune buggies). Vegetation characteristics in these use areas are discussed later. Trees in the riparian areas have also been impacted through their roots becoming exposed by ORV traffic close to the trunks.

Control of Nonnative Vegetation

There is always a risk of nonnative plant species invading the site of any surface disturbance. Activities that disturb plant communities, such as through removal of vegetation, may affect their succession and composition. If the plant community is severely damaged, nonnative plants may move in and establish a permanent change in vegetation detrimental to either the establishment of a natural plant community or the reestablishment of native wildlife species.

Nonnative vegetation is a potential threat to the native vegetation communities of the national recreation area. Thirty-seven nonnative species have been documented in the national recreation area, 10 of which have been classified as "highly invasive" and are displacing native species and 8 of which are classified as "invasive and potentially problematic." The most common highly invasive species found at the national recreation area include Russian thistle, commonly known as Mexican fireweed; *Kochia scoparia*; and saltcedar, which affects approximately 7,000 acres (NPS 2002a). Invasive or noxious weeds present a potential threat to the ecosystems of national park units throughout the country and control or eradication of these species is often extremely difficult and expensive. In both areas of the national recreation area where ORV use occurs, the NPS is managing saltcedar by cutting and burning, followed by treatment with approved herbicides.

BLUE CREEK

The Blue Creek area is located in the northwest corner of the national recreation area (see figure 2). ORV use in this area has caused vegetation damage primarily along the national recreation area's northwest boundary, where a small tributary creek leads to a waterfall. Broad ORV tracks, cutting through the vegetation, parallel the creek and cross it several times. The waterfall area is badly damaged. In addition to extensive trampling by feet and ORV wheels, large plants (trumpet evening primrose [*Oenothera*

jamesii]) have been dug out and removed from immediately around the waterfall, perhaps by individuals attempting to grow them in cultivation (Nesom and O'Kennon 2005). The south side of Blue Creek near Timber Hollow and near the former location of the "Big Tree" has extensive ORV use, with ruts as deep as 8 feet causing damage to current vegetation in the area. Current vegetation found in the Blue Creek ORV use area is presented below.

Types of Vegetation Classifications Found in Blue Creek

Although all of the following vegetation classifications are found in Blue Creek (NPS 2002a; Nelson et al. 1999), the predominant classifications are mixed grassland, yucca grassland, mesquite grassland, and emergent scrub/shrub. Although not as pronounced, the following vegetation classifications are also found in the area: vegetated cliffs, mixed forest, unconsolidated shore, and riverine grassland (NPS 2002a).

Mixed Grassland—Densely vegetated with mesquite, small soapweed yucca (*Yucca glauca* Nutt. var. *glauca*), blue stem grasses (*Andropogon gerardii*), grama grasses (*Bouteloua*), purple threeawn (*Aristida purpurea* Nutt.), and others. Mixed large vegetation may be mesquite, yucca, or other woody plants.

Yucca Grassland—Similar to mixed and mesquite grassland; densely vegetated with small soapweed yucca, mesquite, blue stem grasses, purple threeawn, and others, with yucca the predominant larger vegetation.

Mesquite Grassland—Similar to mixed grassland; densely vegetated areas comprising small soapweed yucca, blue stem grasses, grama grasses, purple threeawn, and others, with mesquite the predominant larger vegetation.

Emergent Scrub/Shrub—Low-lying areas that may be inundated by lake level fluctuations and are vegetated with common reeds (*Phragmites australis*), switchgrass (*Panicum virgatum* L.), cottonwoods, willows (*Salix*), saltcedar, and seep willow (*Baccharis salicifolia*).

Vegetated Cliffs—Composed of sloped areas along ravines that are sparsely vegetated with blue stem mesquite (*Prosopis* spp.), grama grasses, netleaf hackberry (*Celtis reticulata* Torr.), and soapberry (*Sapindus saponaria*).

Mixed Forest—Areas that are densely populated with trees including hackberry, one-seed juniper (*Juniperus monosperma*), cottonwood, soapberry, mesquite, and saltcedar.

Unconsolidated Shore—Areas adjacent to inland waters consisting of fine sands with little or no vegetation. If vegetation is present, it is sparse, with species such as salt grass (*Distichlis spicata*), saltcedar, or herbaceous plants.

Riverine Grassland—Areas that are densely vegetated with switchgrass, common reed, seep willow, saltcedar), yellow or white sweet clover (*Melilotus* spp.), and others.

ROSITA FLATS

Rosita Flats is located in the southwest corner of Lake Meredith National Recreation Area (see figure 3). Damage to the natural communities in the Rosita Flats area is extensive. It is also highly conspicuous. Vegetation on the canyon walls and hills has been severely damaged by ORVs. Dunes and floodplains have been left vulnerable due to ORV use (Nesom and O'Kennon 2005). Evidence of unauthorized ORV use is also found at Bull Taco Hill, which is outside the ORV use area because it is above the 3,000-foot

elevation contour. In the riparian area along Rosita Flats, the national recreation area manages saltcedar, which has been identified as an invasive species. The saltcedar is managed by cutting, burning, and then applying approved herbicides. Hundreds of acres of saltcedar are controlled using this method at Lake Meredith National Recreation Area (NPS 2002a). Current vegetation found in Rosita Flats is presented below.

Types of Vegetation Classifications Found in Rosita Flats

The predominant vegetation classifications found at Rosita Flats are yucca grassland, disturbed grassland, and emergent vegetation (NPS 2002a; Nelson et al. 1999). Other vegetation classifications that are found in the area to a lesser extent include mixed forest, mixed grassland, mesquite grassland, vegetated cliffs, emergent scrub/shrub, and riverine grassland (NPS 2002a).

Yucca Grassland—Similar to mixed and mesquite grassland; densely vegetated with small soapweed yucca, mesquite, blue stem grasses, purple threeawn, and others, with yucca the predominant larger vegetation.

Disturbed Grassland—Disturbed grasslands are sparsely vegetated with switchgrass, common reed, seep willow, saltcedar, yellow or white sweet clover, and others.

Emergent Vegetation—Low-lying areas comprising emergent vegetation are occasionally inundated with freshwater from rain events or lake level fluctuations. These areas are dominated by reeds, rushes (J *Juncus*), cattails (*Typha*), *Scirpus*, and others.

Mixed Forest—Areas that are densely populated with trees including hackberry, one-seed juniper, cottonwood, soapberry, mesquite, and saltcedar.

Mixed Grassland—Densely vegetated with mesquite, small soapweed, blue stem grasses, grama grasses, purple threeawn, and others. Mixed large vegetation may be mesquite, yucca, or other woody plants.

Mesquite Grassland—Similar to mixed grassland; densely vegetated areas comprising small soapweed yucca, blue stem grasses, grama grasses, purple threeawn, and others, with mesquite the predominant larger vegetation.

Vegetated Cliffs—Composed of sloped areas along ravines that are sparsely vegetated with blue stem, mesquite, grama grasses, netleaf hackberry, and soapberry.

Emergent Scrub/Shrub—Low-lying areas that may be inundated by lake level fluctuations and are vegetated with reeds, switchgrass, cottonwoods, willows, saltcedar, and seep willow.

Riverine Grassland—Areas that are densely vegetated with switchgrass, common reed, seep willow, saltcedar, yellow or white sweet clover, and others.

WATER RESOURCES

Water quantity and quality affect ecology and visitor experience in the Lake Meredith National Recreation Area, which contains water resources in the form of impounded reservoir water and tributaries, as well as groundwater in various aquifers. Within the Blue Creek and Rosita Flats ORV use areas, current management allows the operation of vehicles in and adjacent to portions of Big Blue Creek, the Canadian River, and Bonita Creek.

SURFACE WATER

Roughly 99 miles of streams, fed primarily by springs, feed into Lake Meredith National Recreation Area. Lake Meredith water is ultimately blended with wellfield water from the Ogallala aquifer to supply drinking water to the 11 member cities of the CRMWA, including Amarillo and Lubbock (NPS 2007b). The Canadian River watershed, within which the national recreation area is located, encompasses over 13,000 square miles. The Mora River, Ute Creek, and Rita Blanco Creek supplement flow to the Canadian River above Lake Meredith. Conchas Lake, Lake Rita Blanca, and Ute Reservoir are also located upbasin of the national recreation area. Very few well-defined drainages exist within the Canadian River watershed, which is relatively flat with an eastward slope of 8 to 10 feet per mile. In some areas throughout the watershed, surface water runoff is restricted to depressions that cover the plains, forming small ponds (playa lakes), where it evaporates or percolates into groundwater (NPS 2002a). The primary drainage in and out of the lake is the Canadian River, which originates on the eastern slope of the Sangre de Cristo Mountains in northeastern New Mexico and flows underground for much of its distance as it is fed by snowmelt in the mountains, rainfall, and groundwater discharge in the form of springs emerging from the Ogallala and other formations. The Canadian River also flows through the Rosita Flats ORV use area before it enters Lake Meredith. Big Blue Creek, which flows through the Blue Creek ORV use area, is a tributary to Lake Meredith.

Canadian River at Rosita Flats

Big Blue Creek

SURFACE WATER QUALITY

Under the 1972 federal Clean Water Act and subsequent amendments, states are required to develop water quality standards for all surface waters, monitor these waters, and identify and list those waters not meeting water quality standards. A water quality standard is the combination of its designated use and the water quality criteria designed to protect that use. Examples of designated uses include recreational activities (fishing and swimming) and drinking water supply. For the purpose of water quality regulation, the State of Texas has divided the Canadian River Basin into five stream segments encompassing over 294 miles of river, tributaries, and reservoirs. Segment 0102 covers 30 miles and includes Lake Meredith, from the Sanford Dam to the confluence of Camp Creek in Potter County. This segment is designated for contact recreation, aquatic life, and public water supply.

In conformity with the aforementioned federal requirements, the TCEQ identifies the water bodies in or bordering Texas for which effluent limitations are not stringent enough to implement water quality

standards and for which the associated pollutants are suitable for measurement by maximum daily load. In addition, the TCEQ also develops a schedule identifying total maximum daily loads (TMDLs) that will be initiated in the next two years for priority impaired waters. In the 2008 Texas Water Quality Inventory and 303(d) List (TCEQ 2008), one of three subcategories was assigned to each impaired parameter to provide information about water quality status and management activities on that water body.

The categories are defined as

- Category 5: The water body does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants.
- Category 5a: A TMDL is underway, scheduled, or will be scheduled.
- Category 5b: A review of the water quality standards for this water body will be conducted before a TMDL is scheduled.
- Category 5c: Additional data and information will be collected before a TMDL is scheduled.

Several surface water impairments exist in the vicinity of Lake Meredith. These are detailed in table 8.

TABLE 8: SURFACE WATER IMPAIRMENTS IN THE VICINITY OF LAKE MEREDITH

Surface Water	Segment ID	303(d) List Category	Impairment	Year First Listed
Downstream half of lake, including Big Blue Creek arm	0102_01	5c	Chloride	2006
			Mercury in edible tissue	2002
			Sulfate	2006
			Total dissolved solids	2006
Upstream half of lake, above Big Blue Creek arm	0102_02	5c	Chloride	2006
			Mercury in edible tissue	2002
			Sulfate	2006
			Total dissolved solids	2006
Lake Meredith headwaters to Sand Creek	0103_01	5c	Chloride	2006
Sand Creek to Punta de Agua Creek	0103_02	5c	Chloride	2006
Punta de Agua Creek to New Mexico State Line	0103_03	5c	Chloride	2006

Source: TCEQ 2008.

In addition to the water quality impairments listed in table 8, there has been some concern that MTBE, an additive that is blended with gasoline during the refining process, may be present in Lake Meredith due to the large amount of watercraft usage. However, because no studies have been found thus far on this issue, the effects of this chemical on the lake are unknown (NPS 2002a).

Chloride is a drinking water contaminant present throughout Lake Meredith and its tributaries. Sources of chloride include oil and gas activities that produce brine, which can contaminate surface waters (TCEQ 2007). While it is not considered to present a risk to human health, the recommended maximum contaminant level for chloride is 250 milligrams per liter (mg/L) (equivalent to 250 parts per million

[ppm]). Exceeding this recommended level of chloride in drinking water results in a salty taste (EPA 2010). The EPA primary drinking water standards for chloride neither regulate nor provide for human health protection. Because fish and aquatic communities cannot survive in high chloride levels, aquatic life protection criteria require levels of less than 600 mg/L for chronic (long-term) exposure and less than 1,200 mg/L for short-term exposure (Kywater.org 2010). Water quality measurements at four locations in Rosita Flats indicate chloride levels ranging from 879 mg/L to 1,574 mg/L between 2002 and 2009 (Goodwin 2010). This indicates that the water at the Rosita Flats ORV use area is currently of very low quality due to chloride concentrations and is not suitable for various species of aquatic life. By contrast, water quality measurements at Big Blue Creek near the Blue Creek ORV use area taken between 1999 and 2009 indicate chloride concentrations in the range of 17 mg/L to 300 mg/L (Red River Authority of Texas [RRAT] 2010), which represents an acceptable level of risk to aquatic organisms in this tributary to Lake Meredith.

SOUNDSCAPES AND THE ACOUSTIC ENVIRONMENT

According to the NPS *Management Policies 2006* and Director's Order 47: *Sound Preservation and Noise Management*, an important component of the NPS mission is the preservation of the natural soundscapes associated with national park units (NPS 2000, 2006b). Natural soundscapes exist in the absence of human-caused sound. The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. Natural sounds are intrinsic elements of the environment and part of "the scenery and the natural and historic objects and the wild life" protected by the NPS Organic Act. They are vital to the visitor experience of many parks and provide valuable indicators of the health of various ecosystems. Natural sounds are necessary for ecological functioning and occur within and beyond the range of sounds that humans can perceive. Many mammals, insects, and birds decipher sounds to find desirable habitat and mates, avoid predators and protect young, establish territories, and meet other survival needs. Inappropriate sounds are of concern because they can impede ecological function and diminish the NPS's ability to accomplish its resource protection mission.

Examples of natural sounds commonly heard in the Lake Meredith National Recreation Area include bird songs, wind, and water. Examples of human-caused sounds commonly heard in some areas of the national recreation area include human voices and sounds produced by vehicles, motorboats, and jet airplanes. ORV sounds may be heard in the vicinity of the Blue Creek and Rosita Flats ORV use areas. During hunting season, the sound of gunfire may be prevalent in areas open to hunting. Human-caused sounds and sound levels (or loudness) may be appropriate or inappropriate depending on what uses occur in an area.

SOUNDSCAPES TERMINOLOGY

This section introduces the key terms used to evaluate soundscapes, and discusses the factors that influence human perception of sounds.

Percent Time Audible

Percent time audible is a metric used to describe the amount of time during the analysis period (e.g., hour, day, or season) that ORVs are audible to a human with normal hearing. The audibility of ORVs is determined, in part, by the natural ambient sound levels. Lower natural ambient sound levels result in higher ORV percent time audible. The converse is also true: higher natural ambient sound levels result in lower ORV percent time audible. The percent time audible indicator does not provide information on how loud or quiet ORV sounds are, only whether they are audible or not. Therefore, additional indicators of

sound levels are also important to consider in conjunction with percent time audible. Several examples of sound pressure levels in A-weighted decibel (dBA) scale are listed in table 9.

TABLE 9: DECIBEL LEVELS OF COMMON SOUND SOURCES

Sound	Noise Level (dBA)	Effect
Shotgun firing, jet takeoff (at 100–200 feet)	130	Painful
Turbo-prop at 200 feet, rock concert	110–140	Threshold of pain begins around 125 dBA
Thunderclap (near)	120	Threshold of sensation begins
Stereo (over 100 watts)	110–125	Regular exposure to sound over 100 dBA of more than one minute risks permanent hearing loss
Symphony orchestra, chainsaw, jackhammer	110	
Jet flyover (1,000 feet)	103	
Electric furnace, garbage truck, cement mixer	100	No more than 15 minutes of unprotected exposure recommended for sounds between 90 and 100 dBA
Subway, motorcycle (at 25 feet)	88	Very annoying
Lawnmower, nearby thunder	85–90	85 dBA is the level at which hearing damage (at 8 hours of exposure) begins
Recreational vehicles	70–90	
Diesel truck (40 mph at 50 feet)	84	80 dBA or higher is annoying, interferes with conversation; constant exposure may cause damage
Dishwasher, washing machine	75–78	70 dBA or higher is intrusive, interferes with telephone conversation
Vacuum cleaner	70	
Automobile (45 mph at 100 feet)	60	Comfortable hearing levels are under 60 dBA
Croaking raven (100 feet), conversation	50–65	
Quiet office	50–60	
Refrigerator humming	40	Quiet
Rustling leaves	20	Very quiet
Normal breathing	10	Barely audible
Lowest recorded natural ambient sound level during the winter in Yellowstone National Park backcountry	0	Approximate threshold of human hearing at 1 kilohertz

Source: Table adapted from the National Institute on Deafness and Other Communicative Disorders (http://www.nidcd.nih.gov/health/education/teachers/common_sounds.asp).

Natural Ambient Sound Levels

The natural ambient sound level (L_{nat}) is the baseline sound level that occurs in the absence of human-caused sound. L_{nat} is an estimate of the median ambient level for a site if all anthropogenic sources were removed.

Accurate estimates of L_{nat} require measurement periods with minimal levels of human-caused sound. Soundscapes monitoring was conducted at five sites in the national recreation area—two sites in the Blue Creek ORV use area and three sites in the Rosita Flats ORV use area. Non-natural sounds from oil derrick generators were audible at all monitoring locations for almost all hours of the day and night (e.g., non-natural sounds audible 100 percent or near 100 percent of the time). Traffic noise from U.S. Highway 87/287 similarly was audible at LAMR003, LAMR004, and LAMR005 in Rosita Flats at almost all hours of the day. In such cases, where periods devoid of human-caused sounds are rare, estimating L_{nat} can be problematic. One approach to estimating L_{nat} under such conditions is to state the L_{nat} as the minimum measured sound level. If non-natural noise is audible 100 percent of a given hour, then the L_{nat} is less than the measured minimum level. Using this approach, the mean hourly L_{nat} at the Rosita Flats ORV use area is 30 dBA and the mean hourly L_{nat} at the Blue Creek ORV use area is 26 dBA.

SOUNDSCAPES MONITORING

Soundscapes monitoring in the Lake Meredith National Recreation Area was conducted in late 2008 and early 2009. The 2008 monitoring during November and December is representative of the low ORV use or quiet season in the national recreation area. Measurements during February and March 2009, particularly during the Sand Drags event, are representative of peak use of the national recreation area. The annual Sand Drags event draws an estimated 30,000 people to Lake Meredith and adjacent lands for a weekend of motorsports activities. Attendees participate in semiorganized drag races along sand bars of the Canadian River. The event attracts many off-road enthusiasts, who drive ORVs including 4×4s, dune buggies, dirt bikes, ATVs, modified trucks, and lifted trucks. The sand drags event does not occur on national recreation area land; however, during the event there is an increase in visitation concentrated primarily in the Rosita ORV use area and off–national recreation area lands between U.S. Highway 287 and the Rosita entrance. The Blue Creek ORV use area also receives increased use. The following sections describe the soundscapes monitoring locations, data collection, data analysis methodology, and results. For additional detailed technical information on the soundscapes monitoring, the report “Lake Meredith National Recreation Area Acoustic Monitoring and Modeling of Off-road Vehicles” can be found online at http://parkplanning.nps.gov/lamr.

Soundscapes monitoring was conducted at a total of five sites—two sites in the Blue Creek ORV use area and three sites in the Rosita Flats ORV use area. The soundscape monitoring locations for Blue Creek and Rosita Flats are shown figure 14 and figure 15, respectively.

- Site LAMR001 was 1,100 feet west of highway FM 1913 in the Blue Creek ORV use area, on a slight rise near existing camping sites.
- Site LAMR002 was 200 feet east of FM 1913 in the Blue Creek ORV use area, near the sandbar.
- LAMR003 was 3.3 miles east of U.S. Highway 287, near a campsite/fire pit near the southeastern extent of Rosita, near a popular foot path that climbs up to a lookout on the bluff.
- LAMR004 was 2.5 miles east of U.S. Highway 287, near the center of Rosita in a large, relatively open area. There were several primary trails on all sides.
- LAMR005 was 1.5 miles east of U.S. Highway 287, on a slight rise near the national recreation area entrance to Rosita. Almost all traffic entering the national recreation area passed by this monitor, located approximately 20 feet from the vehicles at the closest point of approach.

FIGURE 14: BLUE CREEK OFF-ROAD VEHICLE USE AREA SOUNDSCAPES MONITORING SITES

FIGURE 15: ROSITA FLATS OFF-ROAD VEHICLE USE AREA SOUNDSCAPES MONITORING SITES

ORV Percent Time Audible

Blue Creek—Figure 16 summarizes the median hourly ORV percent time audible results for the Blue Creek sites LAMR001 and LAMR002. ORV percent time audible at these sites is likely overestimated because it includes some on-road traffic on FM 1913.

In 2008, ORV percent time audible was over 30 percent for the majority of the hours between 6:00 a.m. and 6:00 p.m. The highest median hourly percent time audible in 2008 was 44 percent for the 2:00 p.m. hour. ORV percent time audible was generally at or below 5 percent between 9:00 p.m. and 5:00 a.m.

In 2009, ORV percent time audible was over 40 percent between 2:00 p.m. and 8:00 p.m. The highest median hourly percent time audible in 2009 was 53 percent for the 4:00 p.m. hour. ORV percent time audible was below 10 percent overnight between 9:00 p.m. and 10:00 a.m. ORV percent time audible was slightly higher for a few hours during the Sand Drags event compared to the 2009 monitoring period as a whole, but in other hours was actually lower.

The comparison between the 2008 and 2009 data shows a higher percent time audible in 2008 in the mornings and a higher percent time audible in 2009 in the afternoons. This result could be indicative of a difference in ORV use patterns between November/December and February/March. One potential contributing factor to the difference could be the earlier hour of sunset in the winter.

Rosita Flats—Figure 17 summarizes the median hourly ORV percent time audible results for the Rosita Flats sites LAMR003, LAMR004, and LAMR005.

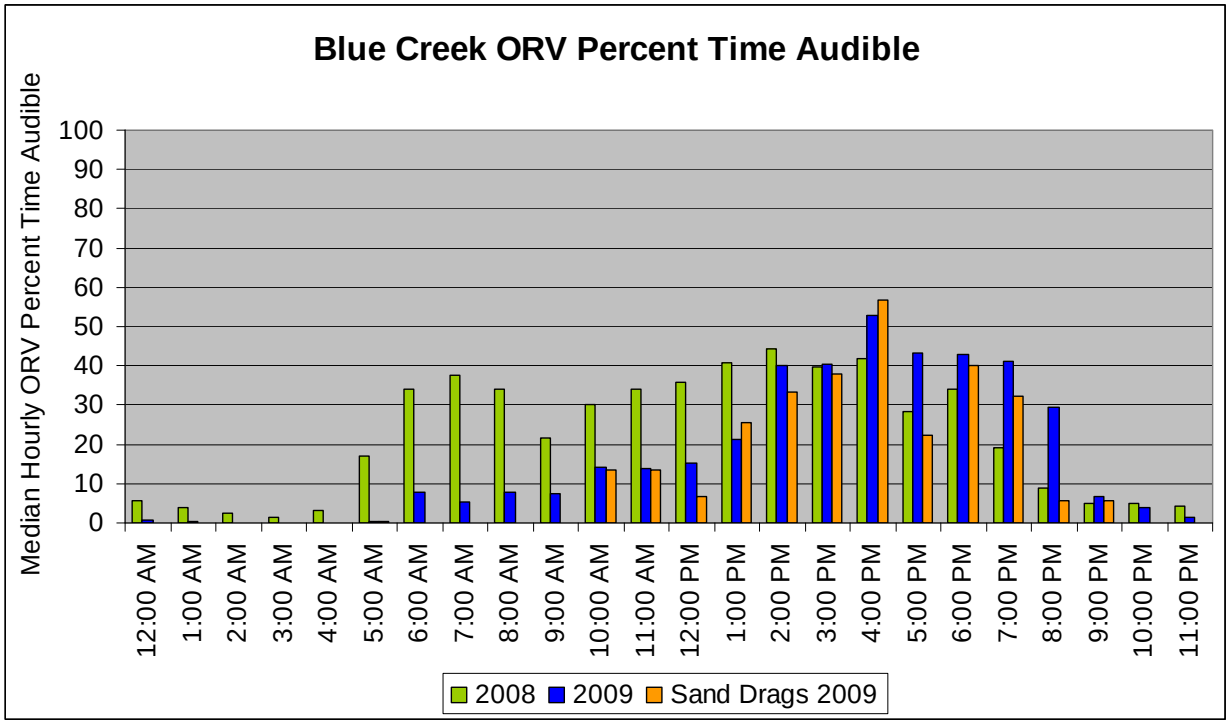


FIGURE 16: BLUE CREEK OFF-ROAD VEHICLE PERCENT TIME AUDIBLE

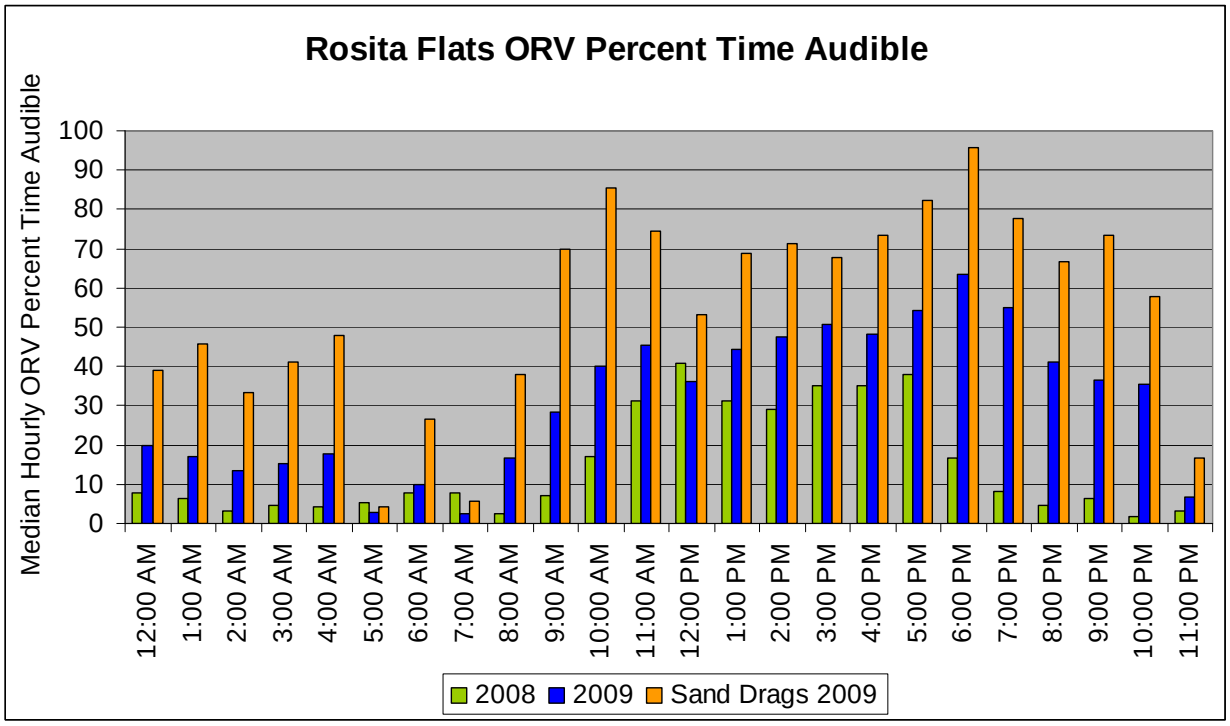


FIGURE 17: ROSITA FLATS OFF-ROAD VEHICLE PERCENT TIME AUDIBLE

In 2008, ORV percent time audible was at or above 30 percent for the majority of the hours between 11:00 a.m. and 6:00 p.m. The highest median hourly percent time audible in 2008 was 41 percent for the 12:00 p.m. hour. ORV percent time audible was below 10 percent between 7:00 p.m. and 10:00 a.m.

The early 2009 ORV percent time audible is substantially higher than in late 2008, reflecting the influence of the Sand Drags event on the 2009 results, as well as seasonal differences in ORV use levels at Rosita Flats. In 2009, ORV percent time audible was over 40 percent between 10:00 a.m. and 9:00 p.m. The highest median hourly percent time audible in 2009 was 63 percent for the 6:00 p.m. hour. ORV percent time audible was below 10 percent in only three hours—5:00 a.m. to 6:00 a.m., 7:00 a.m. to 8:00 a.m., and 11:00 p.m. to midnight.

During the 2009 Sand Drags weekend, ORV sound audibility at Rosita Flats increases substantially above the median levels for the 2009 monitoring period as a whole. Median hourly ORV percent time audible was at or above 60 percent for the majority of the hours between 9:00 a.m. and 11:00 p.m. The highest median hourly percent time audible during Sand Drags was 96 percent for the 6:00 p.m. hour. ORV audibility during Sand Drags continues to be well above typical levels throughout the night, with only two hours below 10 percent.

Maximum Sound Levels

Blue Creek—Figures 18 and 19 display the median hourly maximum sound levels (L_{max}) for the Blue Creek sites LAMR001 and LAMR002. At LAMR001, 2008 and 2009 L_{max} levels were similar throughout much of the day, with 2009 levels being higher than 2008 levels in the afternoon and evening. The highest hourly L_{max} level at LAMR001 in 2008 was 65 dBA between 2:00 p.m. and 3:00 p.m. In 2009, the highest L_{max} level occurred between 4:00 p.m. and 5:00 p.m. (74 dBA).

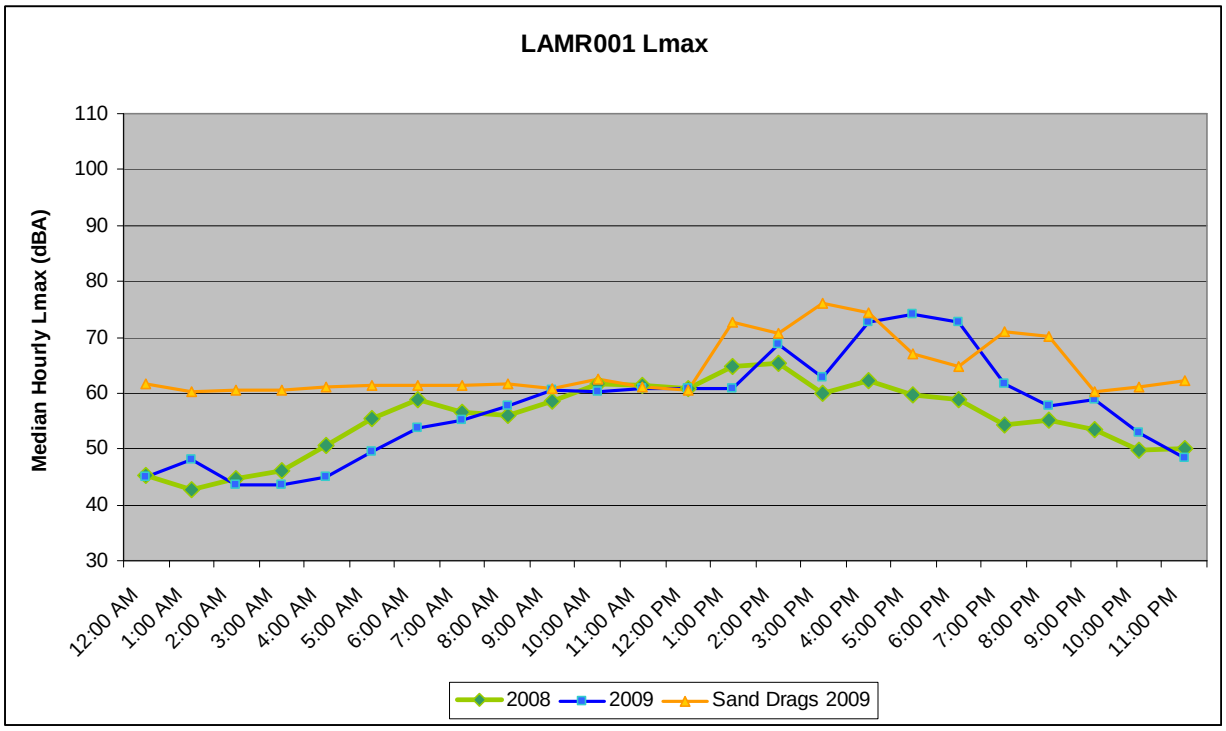


FIGURE 18: MEDIAN HOURLY L_{MAX} SOUND LEVELS FOR BLUE CREEK SITE LAMR001

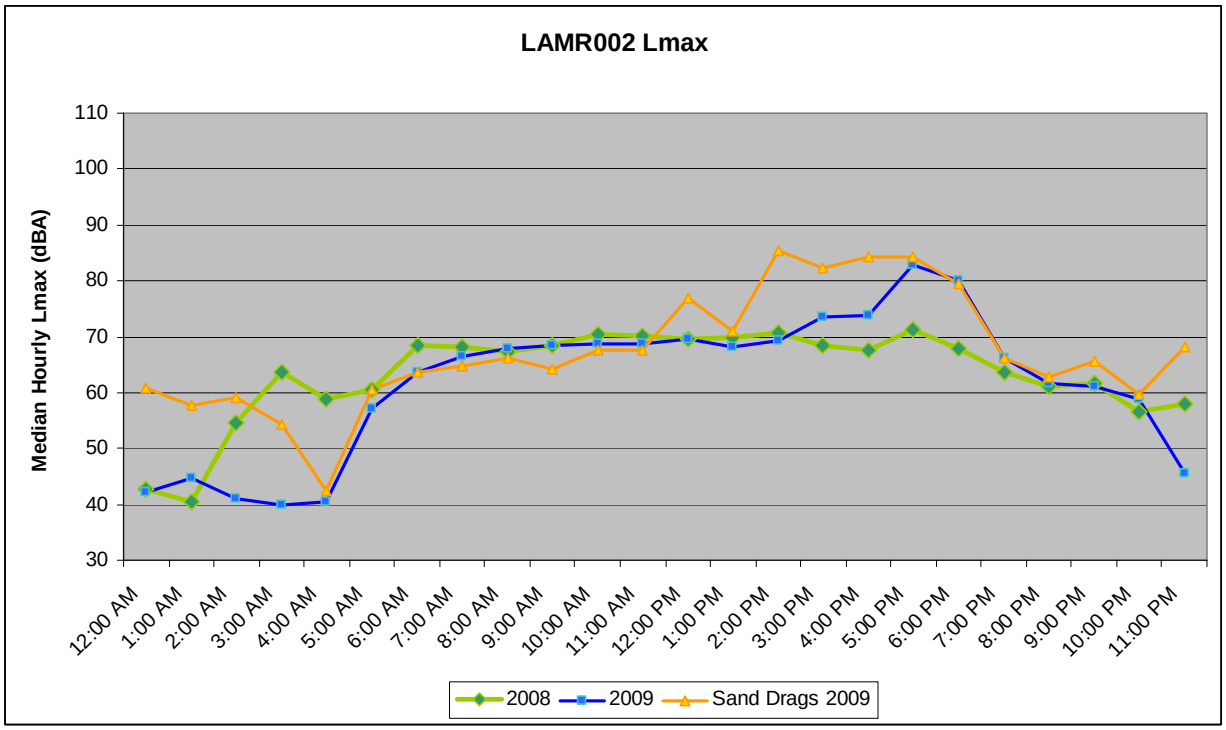


FIGURE 19: MEDIAN HOURLY L_{MAX} SOUND LEVELS FOR BLUE CREEK SITE LAMR002

At site LAMR002, L_{max} levels were nearly identical between 2008 and 2009 between 6:00 a.m. and 3:00 p.m. Greater variations occurred outside these hours, with 2009 levels being approximately 20 dBA lower than 2008 levels in the hours between 3:00 a.m. and 5:00 a.m. The 2009 L_{max} levels were higher than 2008 levels in the evenings at LMAR002.

As with the L_{eq} sound levels, the L_{max} sound levels at LAMR001 during Sand Drags 2009 suggest a constant source of sound energy in the vicinity of this site during the night. Median hourly L_{max} levels at LAMR001 during Sand Drags were never below 60 dBA and were the highest between 3:00 p.m. and 4:00 p.m. (76 dBA). L_{max} sound levels at LAMR002 during Sand Drags were not substantially higher than the levels recorded during 2008 and the 2009 monitoring period as a whole.

Rosita Flats—Figures 20, 21, and 22 display the median hourly L_{max} sound levels for the Rosita Flats sites LAMR003, LAMR004, and LAMR005. The difference between 2008 and 2009 L_{max} levels was not substantial at any of the sites. During Sand Drags all sites experienced higher than typical L_{max} levels in almost every hour, but the magnitude of the increase varied between the sites, likely indicative of the relative proximity of each site to focus areas of ORV activity.

LAMR004 generally had the lowest sound levels of the three sites, with median hourly L_{max} never exceeding 70 dBA during the 2008 and 2009 monitoring periods. L_{max} levels dropped off to under 50 dBA at night at LAMR004. Sand Drags affected sound levels at this site the most between midnight and 4:00 a.m., with a 15 to 20 dBA increase over typical levels. During most of the day, the Sand Drags L_{max} sound levels were 10 dBA or less over typical levels.

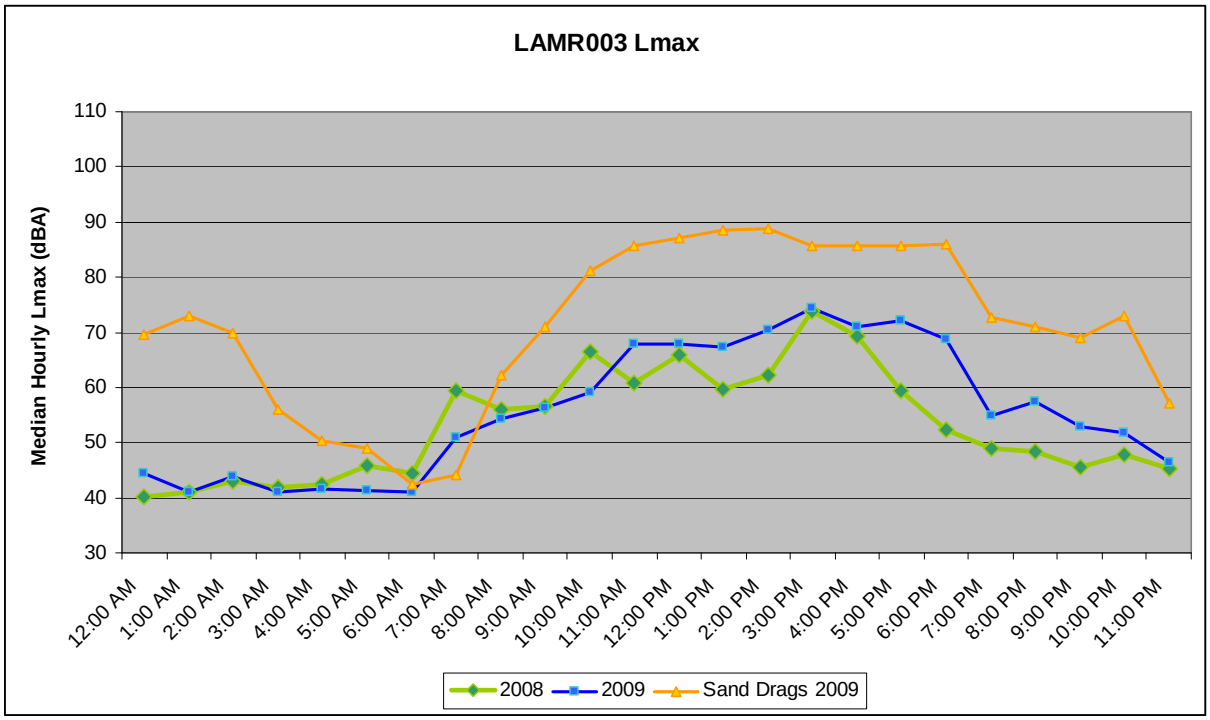


FIGURE 20: MEDIAN HOURLY L_{MAX} SOUND LEVELS FOR ROSITA FLATS SITE LAMR003

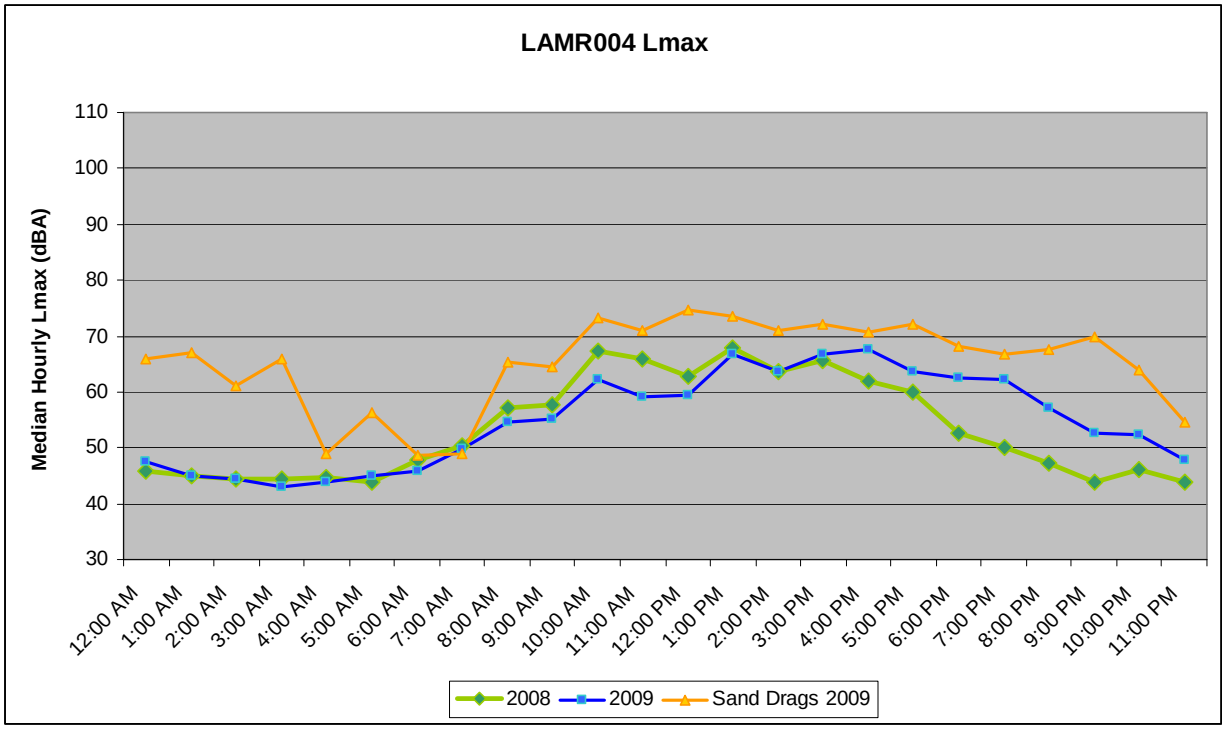
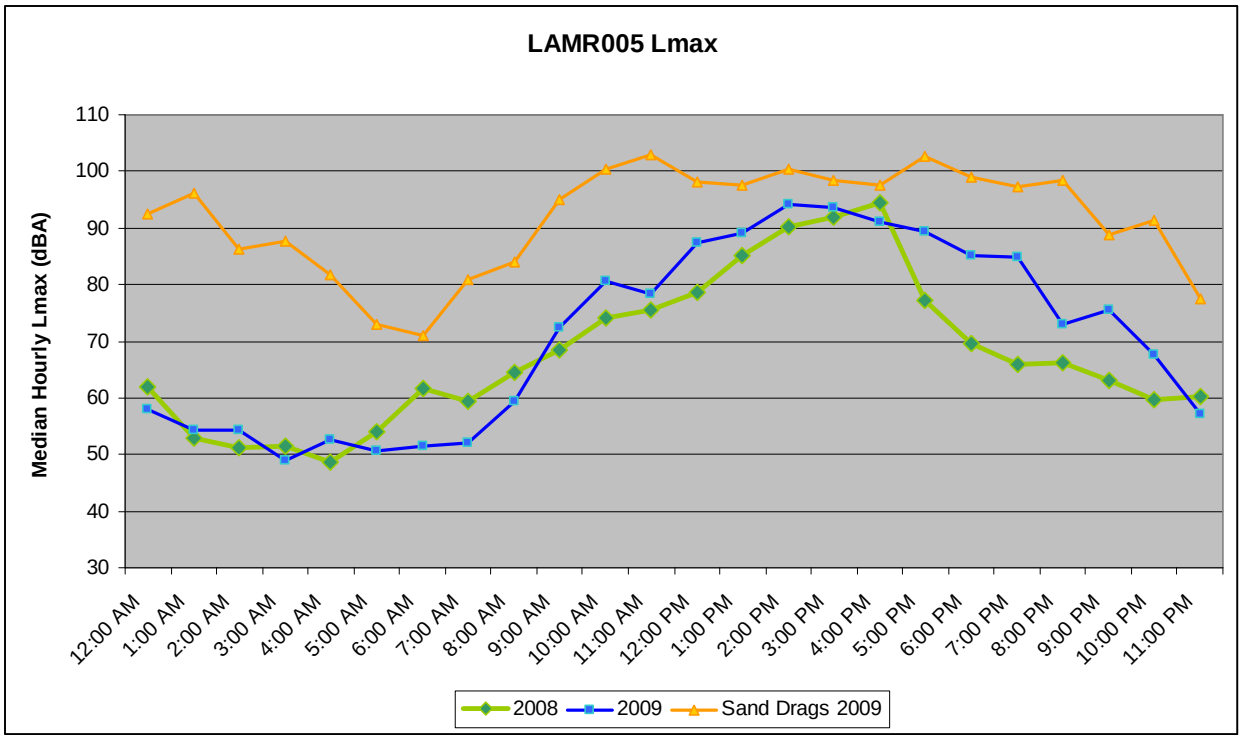


FIGURE 21: MEDIAN HOURLY L_{MAX} SOUND LEVELS FOR ROSITA FLATS SITE LAMR004



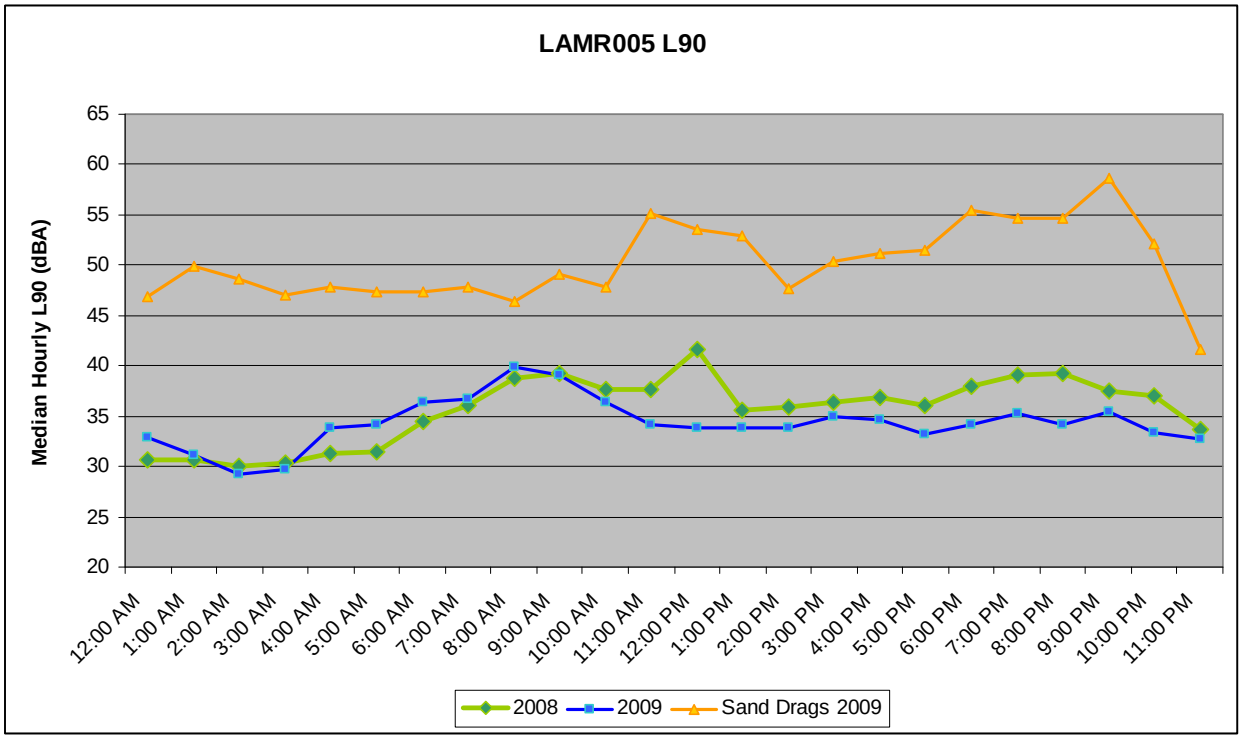


FIGURE 22: MEDIAN HOURLY L_{MAX} AND L_{90} SOUND LEVELS FOR ROSITA FLATS SITES LAMR005

At LAMR003, the highest typical L_{max} levels in the afternoon were slightly over 70 dBA and the lowest, between midnight and 7:00 a.m., were near 40 dBA. The Sand Drags event increased L_{max} levels by up to 30 dBA over typical levels. During Sand Drags, L_{max} levels were over 80 dBA and approaching 90 dBA between 10:00 a.m. and 7:00 p.m.

As a result of being located 20 feet from ORV traffic entering Rosita Flats, LAMR005 generally had the highest sound levels of the three Rosita Flats sites, with hourly L_{max} sound levels during the 2008 and 2009 monitoring peaking at over 90 dBA in the afternoon. In 2008, L_{max} levels were over 80 dBA between 1:00 p.m. and 5:00 p.m. The lowest nighttime L_{max} levels in 2008 and 2009 were around 50 dBA. The additional activity associated with Sand Drags increased L_{max} levels in all hours of the day at LAMR005. Between midnight and 6:00 a.m., the Sand Drags L_{max} levels were up between 30 and 40 dBA over 2008 levels. During four hours of the day, median hourly L_{max} levels at LAMR005 were at or exceeding 100 dBA during Sand Drags.

WILDLIFE AND WILDLIFE HABITAT

Lake Meredith National Recreation Area provides riparian, aquatic, and wetland habitats, all of which support diverse plant and animal species, including migratory waterfowl. The discussion of wildlife for the plan/EIS focuses on aquatic and terrestrial species, including fish, mammals, birds, and reptiles and amphibians in the national recreation area that could be affected by ORV use in Blue Creek and Rosita Flats.

FISH

Common Carp

Channel Catfish

The national recreation area provides important habitat for wildlife in the region, especially species dependent on water. There are approximately 28 different fish species known to inhabit Lake Meredith National Recreation Area, including the Canadian River and Big Blue Creek (NPS 2004; USGS 2006c). Surveys were conducted from May 2009 to January 2010 to document the presence and abundance of the Arkansas River shiner in the national recreation area and, specifically, in the Rosita ORV use area. The study area was the Canadian River from the U.S. Highway 287 bridge downstream to the mouth of Chicken Creek. During the four quarterly sampling events, a total of 4,383 fish, representing 16 species and 5 families, were captured, identified, and released (NPS 2010a). Aside from the Arkansas River shiner, which is discussed further under the "Threatened and Endangered Species / Species of Concern" section of this chapter, other common fish species captured included the plains minnow (*Hybognathus placitus*) (27 percent of the assemblage), peppered chub (*Macrhybopsis tetranema*) (17 percent), and red shiner (*Cyprinella lutrensis*) (14 percent) (NPS 2010a). Other fish species sampled (captured) in the surveys include fathead minnow (*Pimephales promelas*), common carp (*Cyprinus carpio*), plains killifish (*Fundulus zebrinus*), western mosquitofish (*Gambusia affinis*), inland silverside (*Menidia beryllina*), channel catfish (*Ictalurus punctatus*), black bullhead (*Ictalurus melas*), green sunfish (*Lepomis cyanellus*), flathead chub (*Platygobio gracilis*), bluegill (*Lepomis macrochirus*), orangespotted sunfish (*Lepomis humilis*), and yellow bullhead (*Ameiurus natalis*). Generally these fish species live in a variety of habitats, including shallow lakes, reservoirs, ponds, swamps, creeks, side pools of silty streams, and small to medium rivers with slow to moderate current; usually warm water with abundant vegetation. Spawning typically occurs in the spring and summer for the

majority of these fish species. Eggs are often laid in a nest on gravel or sandy silt bottoms in shallow water (NatureServe 2009). However, the peppered chub, plains minnow, and flathead chub broadcast semibuoyant, nonadhesive eggs in the water, which drift downstream during development (Durham and Wilde 2006).

The warmouth (*Chaenobryttus coronarius*) and sand shiner (*Notropis stramineus*) were recorded in the Canadian River prior to the construction of Sanford Dam in 1962, but it is likely that these species, as well as the golden shiner (*Notemigonus crysoleucas*), were extirpated from the national recreation area after the impoundment (NPS 2004). Although the gizzard shad (*Dorosoma cepedianum*), river carpsucker (*Carpiodes carpio*), and white crappie (*Pomoxis annularis*) have been historically recorded in the national recreation area, none were recorded in the Canadian River and coastal waters of Big Blue Creek Bay in 2002 and 2003 (NPS 2004) or recently in the Canadian River in 2009 (NPS 2009f, 2009g, 2009h). It is likely that these fish species are still present in the lake (NPS 2004).

No recent sampling for the documented presence of fish has occurred in Big Blue Creek; however, it is possible that some of the fish sampled during the shiner survey in the Canadian River are present in that area. Although Texas Parks & Wildlife conducts sampling of fish annually in Lake Meredith, it does not conduct river sampling in the national recreation area (Munger 2011). A 1997 study collected only three fish species in Big Blue Creek at FM 1913, including 65 plains killifish, 5 bluegills, and 1 green sunfish. Big Blue Creek is generally characterized by shallow water running over a sandy bottom and dries up frequently during the year, possibly providing unsuitable habitat for some fish species found in the Canadian River (RRAT 1998).

Larger fish species common to Lake Meredith include walleye (*Stizostedion vitreum*), bass (*Micropterus salmoides*, *M. dolomieu*), and trout (*Salmo gairdnerii*, *S. trutta*). Although some of these species have been found in the Canadian River in the national recreation area, they generally live in moderately deep waters and are more common in Lake Meredith (NatureServe 2009; NPS 2004; Phillips 2004).

Primary threats to several fish species found in the national recreation area (e.g., flathead chub, shiner, and plains minnow) include habitat destruction, pollution, dewatering and stream channelization, impoundments altering natural flow regimes, and fluctuating water temperatures (NatureServe 2009). In the Blue Creek and Rosita ORV use areas, it is common for rivers and streams to dry up, leaving fish congregated in small to large puddles. ORVs that drive through the puddles pose a great threat to the congregated fish species (Wimer 2010a).

MAMMALS

The general surroundings of the Blue Creek and Rosita ORV use areas provide habitat for several mammals that depend on the mixed grassland habitats that exist along the tops of the mesas or the more riparian habitat types found along the Canadian River and Big Blue Creek shores. There are approximately 60 species of mammals believed to be native to the national recreation area, including carnivores, hoofed mammals, small mammals, and bats. Carnivorous mammals, such as coyotes (*Canis latrans*), swift foxes (*Vulpes velox*), and gray foxes (*Urocyon cinereoargenteus*), are present in the national recreation area with varying abundance for each species (NPS 2004). Coyotes are considered common and widespread in the national recreation area and can be found in all habitat types. The swift and gray foxes are considered uncommon to rare in the national recreation area, and can be found in riparian/cottonwood and prairie/grassland habitats (NPS 1977). One possible explanation for the fox scarcity may be coyote predation (NPS 2004). Swift fox suppression by coyote predation was demonstrated by a study in the Texas Panhandle in 1998–2001 (Kamler et al. 2003).

Bobcat (*Lynx rufus*) sightings are rare, but this species has also been known to inhabit the national recreation area and tends to prefer wooded and broken habitats (NPS 2004; Yancey et al. 1998). The American badger (*Taxidea taxus*) is uncommon in the national recreation area, but has been known to live in or near the Blue Creek and Rosita ORV use areas. In 2002–2003, badger tracks were regularly seen along Chicken Creek in Potter County, and one badger was seen on FM 1913 north of Big Blue Creek in Moore County (NPS 2004). Badgers favor open prairies and plains with sandy soil, and tend to avoid wooded regions and areas with rocky soils (Yancey et al. 1998).

Distributed in a variety of suitable habitats throughout Texas, the white-tailed deer (*Odocoileus virginianus*) is relatively common and widespread through riparian habitats of the Canadian River Valley and associated creeks, including Rosita Meadows (Manning and Jones 1998; NPS 2004). However, this deer also inhabits drier grassland areas favored by the mule deer. Mule deer (*Odocoileus hemionus*) are wide-ranging and inhabit mostly rocky slopes and uplands with juniper or mesquite savanna. Pronghorn antelope (*Antilocapra americana*) may occasionally stray into the area, but they are primarily found in the flatter topography in upland prairies away from the Canadian River (NPS 2004).

Common small mammals known to appear in Lake Meredith National Recreation Area include raccoons (*Procyon lotor*), ground squirrels (*Spermophilus tridecemlineatus, S. spilosoma*), shrews (*Cryptotis parva, Notiosorex crawfordi*), cottontails (*Sylvilagus audubonii, S. floridanus*), black-tailed jackrabbits (*Lepus californicus*), plains pocket gophers (*Geomys bursarius*), and several varieties of rats and mice. Other small mammals in the national recreation area include porcupines (*Erethizon dorsatum*), Virginia opossums (*Didelphis virginiana virginiana*), skunks (*Spilogale putorius, Mephitis mephitis*), eastern moles (*Scalopus aquaticus*), and beavers (*Castor canadensis*) (NPS 2004).

In the national recreation area, bat species are likely to be found in rock cliffs and/or riparian/cottonwood habitats (NPS 1977). The pallid bat (*Antrozous pallidus*) was the only bat species recorded in 2001–2003, and was found at the foot of Bull Taco Hill in Rosita Meadows (Potter County) in 2002. Several other species of bat have been known from unspecified locations in the national recreation area, including big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), and Townsend's big-eared bat (*Plecotus townsendii*), but were not observed in a 2001–2003 inventory. Bat surveys for this inventory were largely unsuccessful due to unceasing wind, although it can be stated that bats are probably not common in Lake Meredith National Recreation Area (NPS 2004).

BIRDS

Reservoirs, playa lakes, and river systems are used as important stopover points for birds during migration. A 2001–2003 inventory recorded the presence of 72 species of birds in Lake Meredith National Recreation Area. Prominent birdlife consists of wild turkeys (*Meleagris gallopavo*), northern bobwhites (*Colinus virginianus*), scaled quail (*Callipepla squamata*), mourning doves (*Zenaida macroura*), greater roadrunners (*Geococcyx californianus*), teals (*Anas* spp.), and red-winged blackbirds (*Agelaius phoeniceus*) (NPS 2009i). The national recreation area lies along the Central Flyway, which is a major north–south bird migration route located between the arid region to the west and the moister landscapes to the east. Large numbers of ducks, geese, and other migratory birds arrive seasonally to use open water areas as well as wetland areas during the fall through spring months.

Additional birds commonly seen in the national recreation area include mallards (*Anas platyrhynchos*), black-crowned night herons (*Nycticorax nycticorax*), Mississippi kites (*Ictinia mississippiensis*), American kestrels (*Falco sparverius*), ring-necked pheasants (*Phasianus colchicus*) (a nonnative species), common night-hawks (*Chordeiles minor*), woodpeckers (*Melanerpes erythrocephalus, Picoides scalaris*), western kingbirds (*Tyrannus verticalis*), flycatchers (*Tyrannus forficatus, Myiarchus cinerascens*), cliff swallows (*Petrochelidon pyrrhonota*), rock wrens (*Salpinctes obsoletus*), eastern bluebirds (*Sialia sialis*),

northern mockingbirds (*Mimus polyglottos*), common moorhens (*Gallinula chloropus*), gulls and terns, and several species of sparrow (NPS 2004; USGS 2006b).

Foraging great blue herons (*Ardea herodias*) have been observed throughout the Canadian River Valley, on the shores of Lake Meredith, and in Sanford Marsh. A 2002–2003 inventory listed this bird as an uncommon nesting species in the national recreation area. One rookery is known to exist in Hackberry Canyon and probably in the northwest corner of the national recreation area (most likely in a lower, heavily wooded part of Big Blue Creek) (NPS 2004). Great blue herons migrate to their northern breeding range between February and early May. Their nests are commonly high in trees in swamps and forested areas (NatureServe 2009).

Although several birds are observed in the Blue Creek and Rosita ORV use areas, no nesting is known to occur in these locations (Wimer 2010a).

REPTILES AND AMPHIBIANS

Approximately 32 species of reptiles and 11 species of amphibians are thought to be native to the national recreation area, including turtles, lizards, frogs, and snakes (NPS 2005). Common amphibians known to live in the national recreation area include tiger salamander (*Ambystoma tigrinum*), five species of toad (*Bufo* spp.), two species of spadefoot (*Scaphiopus* spp.), cricket frog (*Acris crepitans*), leopard frog (*Rana pipiens*), and bullfrog (*Rana catesbeiana*). Common reptiles known to live in the national recreation area include six species of turtle (snapping, yellow mud, red-eared, ornate box, spiny softshell, and smooth softshell); nine species of lizards (lesser earless, greater earless, fence, side-blotched, Texas horned), including the Great Plains skink (*Eumeces obsoletus*), six-lined racerunner (*Cnemidophorus sexlineatus sexlineatus*), Texas spotted whiptail (*Cnemidophorus gularis gularis*), and checkered whiptail (*Cnemidophorus tesselatus*); and 23 species of snake, including two poisonous species, the prairie rattlesnake (*Crotalus viridis*) and western diamondback rattlesnake (*Crotalus atrox*) (NPS 2004; USGS 2006a).

The herpetofauna (i.e., amphibians and reptiles) at the national recreation area are not well known; however, a 2002–2003 inventory was conducted at Lake Meredith and Alibates Flint Quarries to better describe the vertebrate species located in the national recreation area (Patrikeev 2008). According to this inventory, the most common and widespread amphibian in the national recreation area was the Woodhouse's toad (*Bufo woodhousii woodhousii*). This species inhabits riparian and sandy areas, gradient slopes, and marshes, and often breeds in ephemeral pools and puddles along Big Blue Creek in the national recreation area (Patrikeev 2008). Eggs are laid in spring or summer, and the eggs and larvae generally develop in the shallow water of marshes, rain pools, ponds, and other bodies of water lacking a strong current. The Woodhouse's toad, in addition to other amphibians in the national recreation area, is most threatened by human-caused habitat degradation and by mortality on roads near breeding sites (NatureServe 2009).

The ornate box turtle (*Terrapene ornata ornata*) was the most frequently encountered turtle in the national recreation area during the 2002–2003 inventory. This turtle is mostly terrestrial and inhabits sandy areas, gradient slopes, borrow, and riparian habitats throughout the national recreation area (Patrikeev 2008). Although this species has not been seen in the study area, its presence is likely, due to its preference for damp environments (Wimer 2010a). The mating season for this species begins in the spring and continues throughout summer until October, with nesting occurring from May through July (Smithsonian Institute n.d.). The Texas horned lizard (*Phrynosoma cornutum*) is listed as a species of concern in Texas, but is widespread and common throughout the national recreation area. This species inhabits open arid and semiarid regions with sparse vegetation, and was most often found in gradient slopes, sandy areas, and on unpaved roads in the national recreation area (NatureServe 2009; Patriveek

2008). With a preference for higher dry areas, this turtle would likely be encountered along the tops of the mesas in Rosita Flats (Wimer 2010a). Their eggs are laid from May through July in nests dug in soil or under rocks (NatureServe 2009). The ornate box turtle and the Texas horned lizard are particularly vulnerable to changes in habitat, especially habitat fragmentation and destruction caused by human-related activities (NatureServe 2009; ARKive 2009).

THREATENED AND ENDANGERED SPECIES / SPECIES OF CONCERN

ARKANSAS RIVER SHINER

First described in 1926, the Arkansas River shiner is listed as threatened by the USFWS (63 FR 64772; USFWS 2005b). This small freshwater minnow has a dorsally flattened head, rounded snout, and small subterminal mouth. Dorsal coloration is typically light tan, with silvery sides gradually grading to white on the belly. Adults reach a maximum length of 2 inches (51 millimeters) (CRMWA 2005; USFWS 2005b).

Arkansas River Shiner
Photo by Ken Collins USFWS

Habitat and Distribution

The Arkansas River shiner historically inhabited the main channels of wide, shallow, sandy-bottomed rivers and larger streams of the Arkansas River basin. Adults are uncommon in quiet pools or backwaters, and are almost never found in tributaries with deep water and bottoms of mud or stone. Like most fish living in the highly variable environments of plains streams, shiners use a broad range of microhabitat features (USFWS 2005d). The Arkansas River shiner was described as having a high thermal and oxygen tolerance, indicating a high capacity to tolerate elevated temperatures and low dissolved oxygen concentrations. Microhabitat selection of this species in the Canadian River in New Mexico and Texas is influenced mainly by water depth and current velocity (USFWS 2005b). Frequent natural flooding is important in maintaining their habitat and helps them compete with invading nonnative aquatic species. The species needs more than 130 miles of unimpounded, flowing water to successfully complete its reproductive cycle (USFWS 2005d).

Microhabitat is the habitat (or environmental conditions and organisms) in the immediate vicinity of an organism. For example, within a larger habitat, such as a deciduous forest, there are a lot of microhabitats that exist – a fallen tree, under a rock, leaf litter, puddles, etc.

Historically, this species was widespread and abundant throughout the western portion of the Arkansas River Basin in Kansas, New Mexico, Oklahoma, and Texas. Within the last few decades, the Arkansas River shiner has disappeared from over 80 percent of its historical range and is almost entirely restricted to about 508 miles (820 kilometers) of the Canadian River in Oklahoma, Texas, and New Mexico (69 FR 59861). In the national recreation area, the Arkansas River shiner is abundant in the Canadian River from Chicken Creek upstream to the U.S. Highway 287 bridge. As described under the “Wildlife and Wildlife Habitat” section of this chapter, surveys were conducted from May 2009 to January 2010 to document the presence and abundance of the Arkansas River shiner and other fish species in the Rosita ORV use area. A total of 1,378 Arkansas River shiners were collected at each of the nine sites sampled during the spring, summer, fall, and winter surveys (see table 10) (NPS 2010a).

TABLE 10: ARKANSAS RIVER SHINERS CAPTURED BETWEEN CHICKEN CREEK AND THE U.S. HIGHWAY 287 BRIDGE AT LAKE MEREDITH NATIONAL RECREATION AREA IN SPRING 2009–WINTER 2010

Season	Site 1[a]	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9[b]	Species Totals	Proportion of Total Fish Captured
Spring	3	19	23	18	5	16	11	30	32	157	16.3
Summer	24	73	6	24	66	51	116	55	58	473	22.9
Fall	2	146	33	16	7	24	10	65	54	357	47.7
Winter	11	0	14	1	17	23	14	259	57	396	57.6
Total Captured	40	238	74	58	95	114	150	408	201	1,378	31.4

Source: NPS 2010a.

[a] Most downstream site; located at the mouth of Chicken Creek.

[b] Most upstream site; located approximately 100 meters (328 feet) downstream from the U.S. Highway 287 bridge; only sites 1–8 were located within Lake Meredith National Recreation Area.

In the spring survey, this species represented 16 percent of the fish captured and was the third most commonly collected fish. In the summer survey, this species represented 23 percent of the fish captured and was the second most commonly collected fish. The Arkansas River shiner represented 47 percent of the fish captured during the fall survey and was the most common fish collected. During the winter survey, the Arkansas River shiner was the most common fish collected, representing 57.6 percent of the total number of fish captured. Overall, the Arkansas River shiner was the most commonly captured fish, representing 31 percent of the assemblage. Across all sites, it occurred in 18 percent of spring samples, 63 percent of summer samples, 38 percent of fall samples, and 24 percent of winter samples (NPS 2010a). A spawning migration upstream would likely explain the relatively low abundance of the fish in the spring 2009 samples, as well as a predominance of one-year-old fish (NPS 2009f, 2009g). No sampling for the documented presence of the Arkansas River shiner has occurred elsewhere in the national recreation area; however, it is likely that the fish is present past Chicken Creek in the Canadian River (Wimer 2010a, 2010b).

Diet

The Arkansas River shiner is a generalist feeder. In the Canadian River of New Mexico and Texas, the stomach contents of this fish were dominated by detritus (such as leaf litter), invertebrates, grass seeds, and sand and silt. Invertebrates were the most important food item, followed by detrital material (69 FR 59863). The presence of sand and silt in the stomach of this species suggests that it forages among sediments on the river bottom. The common occurrence of terrestrial insects in the diet of the Arkansas River shiner indicates that this species also feeds in the water column on drifting invertebrates. The Canadian River is a relatively turbid stream, which might make locating insect prey difficult for some fish; however, the Arkansas River shiner possesses morphological adaptations for detecting prey in turbid waters (Wilde, Bonner, and Zwank 2001).

Breeding Biology

Examination of Arkansas River shiner reproductive organ development between 1996 and 1998 in the Canadian River in New Mexico and Texas demonstrated that the species undergoes multiple, asynchronous (i.e., not occurring at the same time) spawns in a single season (USFWS 2005b). The shiner appears to be in peak reproductive condition throughout May, June, and July; however, spawning may

take place as early as April and as late as September. Successful reproduction of this species appears to be strongly correlated with streamflow, where they are likely to spawn in the upper to mid-water column during elevated flows (70 FR 59825–59826; USFWS 2005a). The fish broadcast semibuoyant, nonadhesive eggs in unprepared, open water, which drift downstream as they develop (Durham and Wilde 2008; 70 FR 59808). In the absence of sufficient streamflows, the eggs would likely settle to the channel bottom and be smothered by silt and shifting substrates (70 FR 59825–59826). One study conducted in the Canadian River in Texas during the 2000 and 2001 reproductive seasons revealed that reproductive success for broadcast-spawning fish in the Canadian River is positively associated with the presence of discharge in the river (Durham and Wilde 2008).

Rapid hatching and development of young is one adaptation in plains fishes, including Arkansas River shiner, for survival in the harsh environments of plains streams. Arkansas River shiner eggs can hatch in 24 to 48 hours after spawning, and larvae are capable of swimming within 34 days (USFWS 2005b). The maximum lifespan is unknown, but the species' lifespan in the wild is likely less than three years (CRMWA 2005).

Risk Factors

The Arkansas River shiner is no longer believed to exist in the Arkansas River in Arkansas, Kansas, and Oklahoma, which is a loss of over 770 miles (1,240 kilometers) of previously occupied habitat (69 FR 59861). The decline of the shiner is primarily the result of modification of the duration and timing of streamflows, habitat loss by inundation, stream depletion due to water diversion and groundwater pumping, water quality degradation (caused by oil and gas, municipal sewage effluent, and manufacturing return flows), competition with invasive nonnative species, and the construction of impoundments (70 FR 59828; USFWS 2009). The fragmentation of streams and rivers, particularly with the construction of reservoirs, throughout the Great Plains has likely acted to increase the frequency of reproductive failure among broadcast-spawning species in these systems through restricting the upstream movement of adults to spawn, leaving drifting eggs without sufficient distance to develop and hatch before being transported into lentic habitats (still or relatively still standing water) (Durham and Wilde 2008).

In the national recreation area, it is common for rivers and streams to dry up, leaving fish congregated in small to large puddles. ORVs driven through these puddles pose a great threat to the congregated fish species, including the Arkansas River shiner (Wimer 2010a).

Critical Habitat

In October 2005, the USFWS published a final rule designating approximately 523 miles (856 kilometers) of rivers as critical habitat for the federally threatened Arkansas River shiner. The areas determined to contain features essential to the conservation of this species include portions of the Canadian River in New Mexico, Texas, and Oklahoma, the Beaver / North Canadian River in Oklahoma, the Cimarron River in Kansas and Oklahoma, and the Arkansas River in Kansas (USFWS 2005c). Although critical habitat is designated along the Canadian River in Texas, no critical habitat for the Arkansas River shiner is currently designated within the national recreation area (Wimer 2010a). The USFWS excluded from designation the proposed critical habitat unit (Unit 1a) in the Canadian River of New Mexico and Texas between Ute Reservoir and Lake Meredith, which includes the portion of the Canadian River within the park. The CRMWA, in cooperation with at least 23 other federal, state, and private partners, completed a special management plan for the Arkansas River shiner within this unit. After review of this special management plan, the USFWS determined that a reasonable certainty of execution and effectiveness exists such that conservation of the shiner would be promoted. Therefore, it was determined that the benefits of exclusion outweigh the benefits of designating critical habitat in this unit (70 FR 59823).

Recovery

The ESA requires the NPS to develop and implement recovery plans for listed species to identify reasonable actions needed to conserve and recover listed species. The recovery plan for the Arkansas River shiner includes measures to eliminate or reduce existing threats, protect existing populations and those areas containing suitable habitat, restore lost or degraded habitats, and preserve the genetic diversity of the species (USFWS 2005a). Recovery plans do not of themselves commit personnel or funds nor do they obligate an agency, entity, or person to implement the various tasks listed in the plan (USFWS 2001). In 2005, the CRMWA released an Arkansas River shiner management plan for the Canadian River from U.S. Highway 54 at Logan, New Mexico, to Lake Meredith, Texas (CRMWA 2005). However, due to limited staff, there are no current management actions being taken to enforce the guidelines of this plan at Lake Meredith (Wimer 2010a).

ARCHEOLOGICAL RESOURCES

The NPS defines archeological resources as "any material remains or physical evidence of past human life or activities which are of archeological interest, including the record of the effects of human activities on the environment. They are capable of revealing scientific or humanistic information through archeological research" (NPS 1998a). Archeological features are typically buried but may extend above ground; they are commonly associated with prehistoric peoples but may be products of more contemporary society.

The cultural history of the northern Texas Panhandle region encompasses at least 13,000 years of prehistory and history. Most of the early occupants were nomadic hunters and gatherers, moving from one locale to another following big game and plant resources. Later, about 1,800 years ago, subsistence became more focused more on farming and agriculture of plants brought into the region from northern Mexico, resulting in a semi-sedentary way of life. Many of these early people visited or actually controlled the nearby Alibates Flint Quarries area to obtain or trade stone for tool manufacturing.

Researchers differ slightly when dividing the cultural history and prehistory of the Texas Panhandle into periods, based on subsistence techniques and material technologies; two versions are presented in table 11.

TABLE 11: CULTURAL HISTORY AND PREHISTORY

From Cloud 2003	From 4G Consulting
Paleo-Indian (12,000 to 5,000 BC)	Paleo-Indian (11,500 to 8,000 BP – before present)
Early Archaic (5,000 to 2,000 BC)	Early-Middle Archaic (8,000 to 4,000 BP)
Late Archaic (2,000 BC to AD 200)	Late Archaic (4,000 BC to 1,800 BP – AD 200)
Early Neo-Indian (AD 200 to 1,100)	Plains Woodland (AD 200 to 1100)
Late Neo-Indian (AD 1100 to 1541)	Plains Village (AD 1100 to 1500)
Historic (AD 1541 to ca. 1950) – based on Coronado's entry into the Southwest	Protohistoric (AD 1500 to 1750)
	Historic (AD 1750 to 1950)

Sources: Cloud 2003; 4G Consulting 2005.

Paleo-Indian people were the big game hunters of the late Pleistocene–early Holocene period, tracking now extinct megafauna, such as mammoth and giant bison, as well as antelope, deer, small mammals, and

waterfowl. During the Archaic period, hunting of large game and small mammals continued, but more evidence of plant exploitation shows up in the archeological record.

The Woodland or Early Neo-Indian period is marked by changes in the material culture and subsistence base. Smaller projectile points (in this case, arrow points) indicate a broad-based large and small game hunting subsistence and the introduction of pottery indicates that plant processing and storage were important. Some pit houses, a less nomadic and more sedentary manifestation, have been found.

During the Plains Village or Late Neo-Indian period, semi-sedentism is seen in slab-lined semi-subterranean house structures grouped in hamlets or villages. As mentioned earlier, cultivated crops such as maize are found in the archeological record, and grinding stones and pottery support an agriculture-based subsistence.

Sedentism is the term archeologists use to describe the process of settling down to live in groups for periods of time. Settling down, picking a place and living in it for part of the year, is partially but not entirely related to how a group gets required resources—food and stone for tools and wood for housing and fires.

Apachean groups had entered the Panhandle in the 15th and 16th centuries, followed by subsequent Comanche groups and various other American Indian groups, such as the Kiowa, into the 1800s, subsisting on wild plants, bison, deer, and antelope (NPS 2002a). Archeological sites of this period include quarry/workshop sites, artifact scatters, tipi rings, and features such as hearths and roasting pits (NPS 2002a). These various tribes were in the general area of the national recreation area during historic times until they were subdued by the U.S. Army in the 1870s. At that time, small settlements of sheep herders (*pastores*) entered the region until they were likewise supplanted by farmers and ranchers in the 1880s (Cloud 2003).

Because of its use as a major trade route, the Canadian River and its tributaries were a major focal point for prehistoric and historic activities, as evidenced by a high density of sites located on the uplands, side drainages, and tributary drainages of the river (NPS 2002a). The majority of the dated archeological sites recorded in the Blue Creek and Rosita Flats areas are prehistoric Late Neo-Indian Substage / Plains Village Period Antelope Creek phase sites (NPS 2002a). Characterized by slab-lined house structures and storage pits, Borger Cordmarked pottery, arrow points, beveled knives, and bison bone tools and demonstrating agriculture including corn, beans, and squash, most of the sites date between AD 1200 and 1450 (Cloud 2003). The majority of archeological materials in the project area are chipped stone tools (4G Consulting 2005).

According to the NPS ASMIS (Archeological Sites Management Information System) database, approximately 280 archeological sites have been recorded within the boundaries of the national recreation area (NPS 2010b). These sites include more than 270 prehistoric sites or isolated finds and at least 5 historic sites with structures. Prehistoric site types range from quarries to burned stone scatters, to rock art, to rock shelters, to village and “pueblo” sites (NPS 2010b).

BLUE CREEK

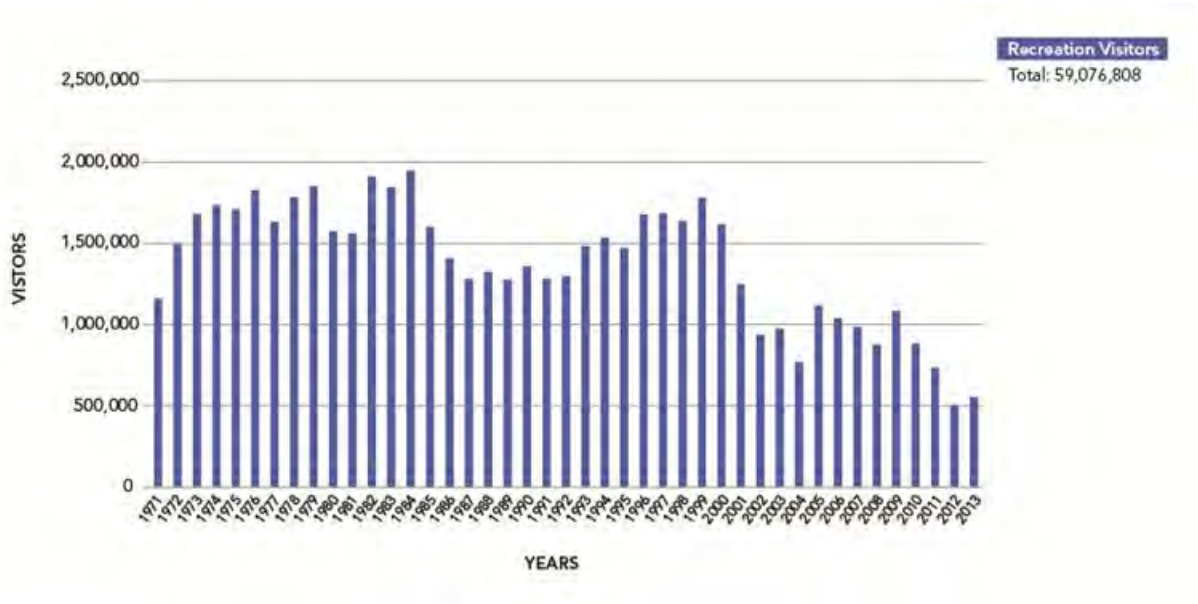
Recent cultural resource inventories have been conducted in or near the ORV use areas. For example, in 2003 the Big Bend Center of Sul Ross State University revisited 23 previously recorded sites and recorded 1 new prehistoric site on the rim or bluff above Blue Creek. The sites include village or hamlet sites and one possible multiple human burial site, all dating to the Antelope Creek phase (AD 1200–1450) (Cloud 2003).

ROSITA FLATS

Archeological surveys were conducted in the Rosita Flats area as part of a plan for prescribed burns in 2005 (4G Consulting 2005). Six previously recorded prehistoric and historic sites were revisited, including a Late Archaic / early Woodland component, one “Late Prehistoric” Antelope Creek phase village site, campsites, open sites with lithic debitage (stone debris from flintknapping), and one cave habitation site. Most sites are located on benches, knolls, or ridges above the Canadian River or tributaries.

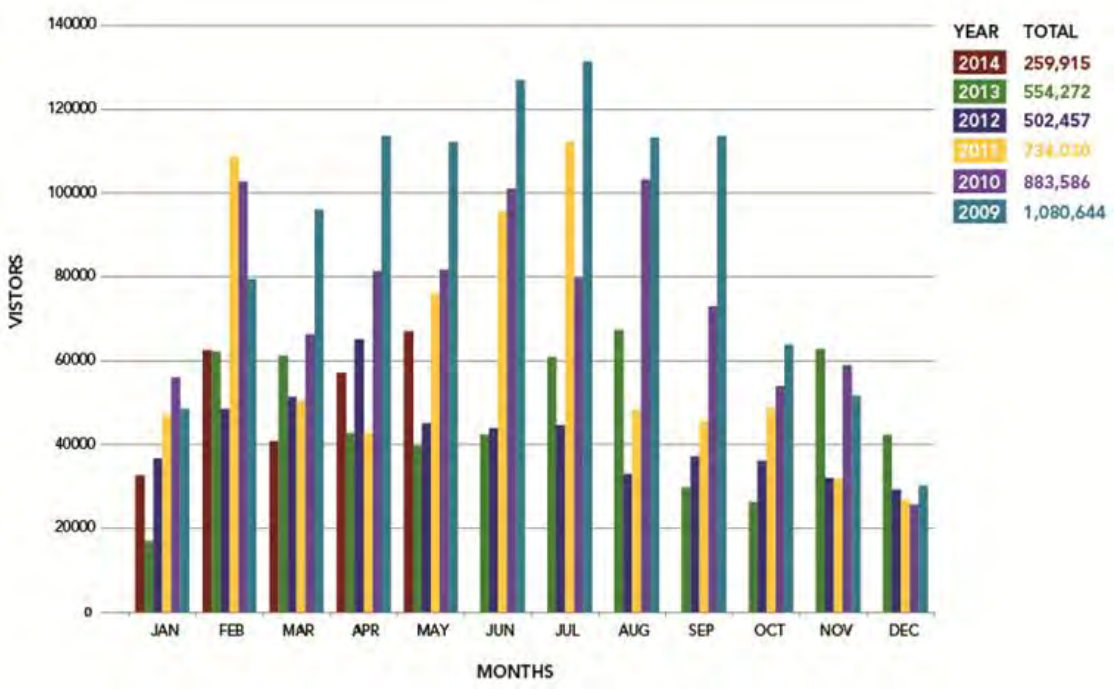
VISITOR USE AND EXPERIENCE / HEALTH AND SAFETY

Visitation to the national recreation area has decreased with occasional dips since the late 1990s. Since 1971, more than 59 million people have visited the national recreation area, which preserves one of the largest human-made lakes in the Texas Panhandle (figure 23). Annual visitation has decreased from 1,779,138 in 1999 to 554,272 visitors in 2013. Figure 24 illustrates visitor use data for January 2009 through May 2014, which indicate that visitation is usually higher during the summer months than in late fall and early winter. Overall, visitation to the national recreation area in 2012 (502,457) was lower than 2011 (734,030).



Source: NPS 2013.

FIGURE 23: ANNUAL RECREATIONAL VISITATION AT LAKE MEREDITH NATIONAL RECREATION AREA, 1971–2013



Source: NPS 2014.

FIGURE 24: MONTHLY RECREATIONAL VISITATION AT LAKE MEREDITH NATIONAL RECREATION AREA, JANUARY 2009–MAY 2014

VISITOR CHARACTERISTICS

A study conducted from October 2003 to November 2004 by ASU showed that the majority of visitors (92 percent) were from Texas, approximately 3 percent were from Oklahoma, and smaller proportions of visitors came from 8 other states. Table 12 shows all 10 states and their respective visitation percentage. The average age of these visitors was 38 (ASU 2004).

TABLE 12: STATE RESIDENCE FOR VISITOR STUDY

State	Lake Meredith (%)
Colorado	1.4
Illinois	0.3
Kansas	1.7
Louisiana	0.3
Missouri	0.3
New Mexico	1.1
Oklahoma	2.5
South Carolina	0.3
South Dakota	0.3
Texas	91.9
Total	100

Source: ASU 2004.

RECREATIONAL OPPORTUNITIES AND USE AT LAKE MEREDITH NATIONAL RECREATION AREA

Lake Meredith National Recreation Area is located near the geographic center of the Texas Panhandle, about 40 miles northeast of Amarillo and 9 miles west of Borger. It is composed of 44,977.63 acres within its boundaries (NPS 2009a). Lake Meredith is used by visitors for many activities, including bird and wildlife viewing, boating, camping, fishing, hiking, horseback riding, hunting, ORV use, photography, picnicking, sightseeing, swimming, and water skiing. According to the 2004 ASU report, a survey conducted on site asked visitors to list activities in which they participated during their visit to the national recreation area; the three most popular were fishing, boating, and picnicking (ASU 2004). Table 13 presents the results of the activity participation survey. Because participants were allowed to check more than one activity they liked, the totals column, if added, is greater than 100 percent.

TABLE 13: ACTIVITY PARTICIPATION (ON-SITE SURVEY)

Activity	Specific Action	Total % of Visitors who Participated in these Activities
ORV	Four-wheel driving	10.7
	Motorized trail biking / dirt biking	7.7
	Dune buggy or sand rail driving	8
	ATV riding	14.1
Camping	Tent camping	22.4
	RV Camping	9.6
Water Use	Swimming	48
	Fishing from shore	34.4
	Boating	38.4
	Fishing from boat	35.5
	Water skiing	22.4
	Personal watercraft	9.1
	Sailboating	3.7
	Scuba diving	1.6
	Canoeing/Kayaking	1.1
Hunting	Bird hunting	4
	Deer hunting	5.3
	Bow hunting	2.7
Other Activities	Mountain biking	2.4
	Picnicking	50.1
	Trail hiking	14.1
	Wildlife viewing	13.9
	Photography	12
	Visiting archeological sites	5.9
	Horseback riding	1.1
	Other	3.2

Source: ASU 2004.

ASU survey respondents revealed that their primary uses of the national recreation area were water use, followed by other activities such as hiking, visiting archeological sites, photography, and wildlife viewing. ORV use was noted as the primary use by approximately 8 percent of visitors, while camping was approximately 1 percent of visitor use. Additional uses include picnicking, trail hiking, mountain biking, and hunting. Table 14 shows visitors' responses.

TABLE 14: PRIMARY ACTIVITY PARTICIPATION

Recreational Activity	Percent of Respondents Who Engaged in the Activity
ORV Use	11.4
Water Use	63.4
Picnicking	12.3
Other Activities	12.9
Total	100

Source: ASU 2004.

Developed facilities, such as the visitor center and campgrounds, are shown on figure 1 in chapter 1. The visitor center is located in the town of Fritch, east of the national recreation area. Campgrounds are located at Bugbee, Sanford-Yake, Cedar Canyon, Fritch Fortress, Harbor Bay, McBride Canyon, Mullinaw Creek, Rosita Flats, Plum Creek, Blue West, Blue East, Chimney Hollow, and Blue Creek Bridge. Boat launch areas are located at Sanford-Yake, Cedar Canyon, Fritch Fortress, Harbor Bay, Blue West, and Plum Creek.

ORV use is one of the wide varieties of recreational opportunities available at the national recreation area, and is often used as a means to take advantage of other experiences at the national recreation area, such as camping and hunting. Since the 1950s, ORV use has evolved from "river buggies," or surplus military vehicles, to dirt bikes, motor vehicles, and standard four-wheel drive vehicles. ORV use is allowed in two designated areas, Blue Creek and Rosita Flats.

Camping Area in Blue Creek

After the ASU study, use data has shown that ORV use continues to be popular. In 2008, approximately 42,070 people visited the national recreation area and used motorcycles or dune buggies. Respondents voiced concern over unregulated ORV use at the national recreation area and conflicts between ORV users and other groups (NPS 2008b). This is discussed in further detail in "Visitor Safety and Encounters."

Off-road Vehicle Use and Access

The national recreation area is the largest area of public lands in the Texas Panhandle. As a result, it provides opportunities for access to diverse, affordable, outdoor, and water-based recreational activities. ORV use has occurred at Rosita Flats and Blue Creek since the 1950s and still is popular today. Currently it is allowed only in these two sections of the national recreation area, Blue Creek and Rosita Flats, with approximately one-third of the national recreation area users participating in ORV use. The majority of ORV use at the national recreation area has been for recreation, as opposed to transportation. Local riders and families, as well as riders from urban areas, tend to favor Rosita Flats (ASU 2004).

ORV Use in Lake Meredith National Recreation Area

Blue Creek

Blue Creek, located on the northwest side of the lake, contains approximately 275 acres of land designated for ORV use. During 2008, over 42,000 visitors came to Blue Creek, which was a 19 percent increase in visitation from the previous year (NPS 2008a). Blue Creek offers a variety of visitor amenities in the ORV use areas, including picnic tables, grills, and vault-evaporator toilets. There are no flush toilets or drinking water available (NPS 2009c). Recreational opportunities at Blue Creek include camping, horseback riding, and ORV use. Types of ORVs allowed at Lake Meredith include ATVs, motorcycles, full-size ORVs, dune buggies, and sand rails. Blue Creek offers different terrain, more level and less extensive, compared to Rosita Flats (Trail Source 2009). National recreation area records show that fewer illegal operations of ORVs occur at Blue Creek because of a greater presence of ranger patrols (NPS 2007a).

Rosita Flats

Rosita Flats, which is located in the southern section of the national recreation area between the Canadian River bed east of the Dumas Bridge to Chicken Creek, contains approximately 1,740 acres of land designated for ORV use below the 3,000-foot elevation line. All vehicles are prohibited past the mouth of Chicken Creek. Tin-cup Canyon is closed to all vehicles. In 2008, over 197,582 people visited Rosita Flats, representing a 77.5 percent increase from the previous year (NPS 2008a). Rosita Flats is an area with an undeveloped campground with no picnic tables, toilets, or drinking water (NPS 2009c).

ORVs at Rosita Flats can be seen almost any day of the year. The average ORV user at Rosita Flats enjoys sightseeing, picnicking, and camping (either in tents or camp trailers) (NPS 2007a). Rosita Flats offers ORV users sand and hill climbs over some of the most diverse land in Texas (Trail Source 2009). Due to its difficult accessibility from the north entrance of the national recreation area, ranger patrols at Rosita Flats are not as frequent as in other areas of the national recreation area, such as Blue Creek, which has resulted in a high level of violations of ORV use regulations in the past (NPS 2007a).

ORV-related Events Outside the National Recreation Area—Sand Drags

The annual Sand Drags is an event held every February just outside the national recreation area to the north of Rosita Flats. In 2009, the event drew large crowds that spilled over into the national recreation area (NPS 2009e). The event has attracted over 30,000 spectators and hundreds of motorcycles, four-wheelers, sand rails, and river buggies that compete against each other in ORV races. The races attracts many outside visitors from states such as Oklahoma, New Mexico, and Colorado who would otherwise not likely visit the national recreation area.

VISITOR SAFETY AND ENCOUNTERS

As part of visitor experience, visitor safety is also considered. Visitors at Lake Meredith National Recreation Area are required to follow certain laws while using ORVs (NPS 2009d).

ORV Use in Lake Meredith National Recreation Area

- Riders of ATVs and motorcycles must wear a Department of Transportation–approved safety helmet.
- ATV riders
  - Must wear eye protection.
  - Must have Safety Certification with them at all times.
  - May not carry a passenger on an ATV unless the ATV is designed for a passenger.
  - May not operate an ATV in a manner that endangers, injures, or damages persons or property.
- Persons under 14 years old must be under direct supervision by their parent, guardian, or other adult authorized by their parent or guardian.
- General ORV laws:
  - Stay within marked boundaries and signs.
  - Use or possession of alcohol while riding on an ATV or in any motor vehicle is prohibited.
  - Organized events require a Special Use Permit.
  - Head and tail lights are required either one-half hour before sunrise or after sunset, or when visibility is reduced.
  - Speed limit in congested areas is limited to 15 mph or less, depending on conditions.
  - Stay on established trails to prevent further erosion of resources.
  - Do not litter; place litter in trash receptacles.
  - Unattended or abandoned campfires are prohibited. Put out fires with water.

Vandalism to Amenities in Rosita Flats

Although ORV users are required to follow all laws, it is difficult for rangers to strictly enforce rules due to the remote location of ORV use areas. This can result in encounters between national recreation area visitors, destruction of national recreation area property, littering, trespassing, and not staying on national recreation area established trails. According to the ASU 2004 visitor study, people were concerned that there are too many ORV routes and that there is unregulated ORV use (ASU 2004). While there are no national recreation area–documented conflicts between ORV users, campers, fishermen, boaters, bird-watchers, or others, some public comments gathered through public scoping indicate that visitors are concerned for their safety in ORV use areas, particularly due to reckless driving, excessive alcohol consumption, excessive speeds, crime, and no respect for boundaries (tent camps and trails). Most user-group conflicts related to ORV use tend to be with other user groups perceiving conflicts with ORV users, although ORV users generally do not recognize these conflicts (ASU 2004). The study also showed concern from ORV users that national recreation area amenities are often destroyed and ORV use areas are dangerous and not a desirable family environment. During public scoping, ORV users expressed their desire for more land dedicated to ORV use because the current areas are too small.

LAKE MEREDITH NATIONAL RECREATION AREA MANAGEMENT AND OPERATIONS

Lake Meredith National Recreation Area is divided into six different management divisions, each with its own unique set of responsibilities. The national recreation area has a total of 29 permanent and 17 seasonal staff positions (Wimer 2009a). Management and operation of the national recreation area is provided by NPS staff organized into the following divisions.

NATIONAL RECREATION AREA MANAGEMENT AND ADMINISTRATION DIVISION

The national recreation area management and administration division conducts all national recreation area–wide management and support activities, including external affairs activities, national recreation area–level planning, human resource management, information technology, and financial management. Within this division there are no responsibilities directly related to ORVs.

RESOURCE MANAGEMENT DIVISION

The resource management division is responsible for activities related to the management, preservation, and protection of the national recreation area’s cultural and natural resources, including scientific research, management, restoration, and resource protection planning. An aspect of this division’s responsibilities unique to the national recreation area is that it must oversee the management of oil and gas operations in the national recreation area. There are two full-time employees in this division: the chief of resource management and an environmental protection specialist. This division monitors the condition of natural and cultural resources in the ORV use areas to control the spread of invasive species. Currently there is no special management in ORV use areas to help control the spread of invasive species (Wimer 2010c).

SOUTHERN PLAINS FIRE GROUP

This group is based at the national recreation area and is responsible for the implementation of the prescribed fire needs of seven parks across three states, including Lake Meredith National Recreation Area. Prescribed fire is an essential tool for managing resources, through hazard fuel reduction and ecosystem restoration. The fire crew also assists all local fire departments and other nearby parks. The NPS fire crew and law enforcement are stationed at the Rosita Flats ORV use area 24 hours a day during the annual Sand Drags event. Depending on the fire danger in the area, the fire crew will make sure visitors do not build campfires; however, fires are allowed in designated barbecue pits. Before the event the fire crew completes a "pre-burn," meaning that it burns a buffer around the area to help contain any fires that may begin to spread. The fire crew's ORV-management responsibilities occur only during Sand Drags. Law enforcement helps ensure that the public does not abuse alcohol during the event (Wimer 2010c).

VISITOR AND RESOURCE PROTECTION DIVISION

The visitor and resource protection division serves the public interest to protect people and resources, prevent crime, conduct investigations, apprehend criminals, and serve the needs of visitors to the national recreation area. This division is also referred to as "Law Enforcement." In relation to ORV management efforts, law enforcement staff members patrol the Blue Creek ORV use area several times per day or several days per week, depending on the season. The summer months of June, July, and August are the peak season, with the lowest visitation occurring in the winter months of December and January. The Rosita Flats ORV use area is patrolled less frequently, primarily due to its distance from the national recreation area headquarters. Rangers issue citations and make arrests for violations in these areas, which are often associated with alcohol, illegal drugs, or unsafe operations of a vehicle. Staff members from this division also respond to emergency situations, such as ORV accidents, wildfire, or search and rescue operations. This division is also responsible for repairing the fencing around ORV use areas and installing Carsonite posts to indicate ORV closures.

INTERPRETATION DIVISION

The interpretation division's chief objective is to facilitate a personal connection between the interests of the visitor and the importance of resources in the national recreation area. Interpretation staff members provide educational information using such methods as guided tours, signs and kiosks, visitor center displays, and campfire programs. There are no interpretive facilities at either of the two ORV use areas.

FACILITIES MANAGEMENT DIVISION

The facilities management division's mission is to ensure that natural and cultural resources are sustained for the future by providing stewardship of assets through maintenance practices, preservation techniques, and the use of new technologies. Facilities staff members maintain roads, paths, buildings, campgrounds, boat ramps, ORV use areas, and other facilities in the national recreation area. This division provides trash removal from mid-April to September on a daily basis and as needed (two to three times per week) from October to April at the Blue Creek ORV use area. Trash is removed weekly from the Rosita Flats ORV use area.

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Environmental Consequences

CHAPTER 4

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This “Environmental Consequences” chapter analyzes beneficial and adverse impacts that would result from implementing any of the alternatives considered in this plan/EIS. This chapter also includes a summary of laws and policies relevant to each impact topic, intensity definitions (e.g., negligible, minor, moderate, and major), methods used to analyze impacts, and analysis methods used for determining cumulative impacts. As required by the CEQ regulations implementing the NEPA, a summary of environmental consequences for each alternative is provided in table 5, which can be found at the end of chapter 2. The resource topics presented in this chapter, and the organization of the topics, correspond to the resource discussions contained in “Chapter 3: Affected Environment.”

SUMMARY OF LAWS AND POLICIES

Three overarching environmental protection laws and their implementing policies guide NPS actions in managing parks and their resources—the Organic Act of 1916 (16 USC 1), NEPA and its implementing regulations, and the NPOMA (16 USC 5901 et seq.). For a complete discussion of these and other guiding authorities, refer to the section titled “Other Applicable Federal Laws, Policies, Regulations, and Plans” in “Chapter 1: Purpose of and Need for Action.” These guiding authorities are briefly described below.

The Organic Act of 1916 (16 USC 1), as amended and supplemented, commits the NPS to making informed decisions that perpetuate the conservation and protection of park resources, leaving them unimpaired for the benefit and enjoyment of future generations.

NEPA is implemented through regulations of the CEQ (40 CFR 1500–1508). The NPS has, in turn, adopted procedures to comply with these requirements, as found in Director’s Order 12 (NPS 2011a) and its accompanying handbook (NPS 2001).

NPOMA (16 USC 5901 et seq.) underscores NEPA provisions in that both acts are fundamental to park management decisions. Both acts provide direction for connecting resource management decisions to the analysis of impacts and communicating the impacts of those decisions to the public, using appropriate technical and scientific information. They also recognize that such data may not be readily available and provide options for resource impact analysis in the absence of such data.

Section 4.5 of Director’s Order 12 (NPS 2011a) adds to this guidance by stating, “when it is not possible to modify alternatives to eliminate an activity with unknown or uncertain potential impacts, and such information is essential to making a well-reasoned decision, the National Park Service will follow the provisions of the CEQ regulations (40 CFR 1502.22).” In summary, the NPS must state in an environmental assessment or impact statement: (1) whether such information is incomplete or unavailable; (2) the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific adverse impacts that is relevant to evaluating the reasonably foreseeable significant adverse impacts; and (4) an evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community. Collectively, these guiding regulations provide a framework and process for evaluating the impacts of the alternatives considered in this plan/EIS.

GENERAL METHODOLOGY FOR ESTABLISHING INTENSITY DEFINITIONS AND MEASURING EFFECTS BY RESOURCE

The following elements were used in the general approach for establishing intensity definitions and measuring the effects of the alternatives on each resource category:

- General analysis methods as described in guiding regulations, including the context and duration of environmental effects.
- Basic assumptions used to formulate the specific methods used in this analysis.
- Intensity definitions used to define the level of impact resulting from each alternative.
- Methods used to evaluate the cumulative impacts of each alternative in combination with unrelated factors or actions affecting national recreation area resources.
- Methods and intensity definitions used to determine whether impairment of specific resources would occur under any alternative.

These elements are described in the following sections.

GENERAL ANALYSIS METHODS

The analysis of impacts follows CEQ guidelines and Director's Order 12 procedures (NPS 2011a) and incorporates the best available scientific literature applicable to the region and setting, the resource evaluated, and the actions considered in the alternatives.

This chapter discusses applicable analysis methods for each resource topic, including assumptions and impact intensity definitions.

ASSUMPTIONS

Duration and Type of Impacts

The following assumptions are used for all impact topics (the terms "impact" and "effect" are used interchangeably throughout this document):

- Short-term: Impacts are temporary (i.e., they occur for a matter of hours up to weeks at a time) without lasting effects. Examples include impacts from the ability of a visitor to access a certain area during a resource closure event.
- Long-term: Impacts are continuous throughout the life of the plan, with potentially permanent effects. Examples include ongoing impacts on national recreation area management and operations.
- Direct: Impacts would occur as a direct result of ORV management actions.
- Indirect: Impacts would occur from ORV management actions, but would occur later in time or farther in distance from the action.

- Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
- Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Impacts of Climate Change

Texas is likely to experience a challenging assortment of climate change conditions in the coming years. Scientists postulate that trends showing rising temperatures, increasing frequency of heat waves and severe weather events, less rain west of the Interstate 35 corridor, a reduction in streamflows, and a decline in biodiversity will continue (Schmandt et al. 2009). In combination, these factors would result in increased severity of drought, drier soils, and reduced availability of surface water. These potential changes underscore the need for management of ORV use in the riparian areas and streambeds of the Lake Meredith National Recreation Area. However, given the complex interactions between multiple factors and the uncertainties over human response to climate change, the level of uncertainty about possible effects on specific resources or impact topics over the 10- to 15-year planning period makes analysis for impacts of climate change in this document speculative. Improved management of ORV access and use would support the resiliency of the national recreation area's wildlife and plant resources, and would be beneficial to those resources as they adapt to changed conditions over future decades.

Mileage Assumptions

Table 15 details the assumptions for the area (in miles or acres) that would be marked off under the action alternatives. Under alternative A, routes and areas would not be designated, and the entire area of Blue Creek and Rosita Flats designated in the Superintendent's Compendium would be open to use.

TABLE 15: ORV ROUTES UNDER THE ACTION ALTERNATIVES

Designated Locations for ORV Use	Alternative B / Alternative D	Alternative C
Blue Creek		
Approximate acres on the sandy bottom area that would be marked by cables.	133 acres	133 acres
Approximate miles of routes and access points to the sandy bottom area that would be marked by carsonite posts or other visible markers.	1 mile	1 mile
Rosita Flats		
Approximate acres south of the Canadian River (currently denuded of vegetation) at the western border of the national recreation area where Highway 287 enters the recreation area open to ORV use.	170 acres	170 acres
Approximate acres south of the Canadian River and on the east side of Bull Taco Hill open to ORV use.	65 acres	0 acres
Approximate acres on the sandy riverbed.	119 acres	119 acres
Approximate miles of marked routes and access points to the sandy riverbed that are marked by carsonite posts or other visible markers.	15 miles	15 miles
Approximate acres south of the Canadian River on the northern border of Highway 287. (Beginner zone under alternatives B and D.)	9 acres	0 acres

Intensity Definitions

Determining intensity definitions is a key component in applying NPS *Management Policies 2006* (NPS 2006b) and Director's Order 12 (NPS 2011a). These intensity definitions provide the reader with an idea of the intensity of a given impact on a specific resource. The intensity definition is determined primarily by comparing the effect to a relevant standard based on applicable or relevant/appropriate regulations or guidance, scientific literature and research, or best professional judgment. Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document. Intensity definitions are provided throughout the analysis for negligible, minor, moderate, and major impacts. Except for the threatened and endangered species topic, the impact intensity definitions are defined for adverse impacts, and beneficial impacts are addressed qualitatively. For endangered and threatened species, beneficial and adverse impacts are qualified to facilitate Section 7 compliance.

CUMULATIVE IMPACTS

The CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all alternatives, including the no-action alternative.

Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects and plans at the national recreation area and, if applicable, the surrounding region. Table 16 summarizes the actions that could affect the various resources at the national recreation area. These actions are described in more detail in the "Other Applicable Federal, Laws, Policies, Regulations, and Plans" section of this document (see "Chapter 1: Purpose of and Need for Action") as well as following table 16. Recreational use—past, present, and future—is considered as an integral part of the action alternatives and is, therefore, not addressed within the cumulative impact scenario.

The analysis of cumulative effects was accomplished using four steps:

Step 1—Resources Affected. Fully identify resources affected by any of the alternatives.

Step 2—Boundaries. Identify an appropriate spatial and temporal boundary for each resource.

Step 3—Cumulative Action Scenario. Determine which actions to include with each resource.

Step 4—Cumulative Impact Analysis. Summarize the cumulative impact of the proposed action plus the other actions affecting the resource in question, defining context, intensity, duration and timing, methodology, etc.

TABLE 16: CUMULATIVE IMPACT SCENARIO

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Soils	National Recreation Area Boundary within Rosita Flats and Blue Creek ORV use areas	Development of the Resources Management Plan Development of the Fire Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan Development of the Oil and Gas Management Plan Invasive Species Removal Ongoing Maintenance Activities Sand Drags event Mesquite Spraying on Adjacent Lands	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the Oil and Gas Management Plan Invasive Species Removal Ongoing Maintenance Activities Sand Drags event Mesquite Spraying on Adjacent Lands Development of the GMP	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the Oil and Gas Management Plan Invasive Species Removal Ongoing Maintenance Activities Sand Drags event Mesquite Spraying on Adjacent Lands Implementation of the GMP
Vegetation	National Recreation Area Boundary, plus Adjacent Land	Development of the Resources Management Plan Development of the Fire Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan Invasive Species Removal Ongoing Maintenance Activities Mesquite Spraying on Adjacent Lands	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Invasive Species Removal Ongoing Maintenance Activities Mesquite Spraying on Adjacent Lands Development of the GMP Decline of Cottonwoods in the National Recreation Area and Region (related to lack of water)	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Invasive Species Removal Ongoing Maintenance Activities Mesquite Spraying on Adjacent Lands Decline of Cottonwoods in the National Recreation Area and Region (related to lack of water) Implementation of the GMP

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Water Resources	National Recreation Area Boundary, plus Adjacent Land	Development of the Resources Management Plan Development of the Fire Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan Land and Water Resources Conservation and Recreation Plan Mesquite Spraying on Adjacent Lands Cooperation with the CRMWA Damming of Canadian River Adjacent Agricultural Use Erosion/Siltation into Lake Meredith	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Mesquite Spraying on Adjacent Lands Cooperation with the Canadian River Water Management Authority Adjacent Agricultural Use Erosion/Siltation into Lake Meredith Development of the GMP Management Actions of CRMWA Lowering of the Lake Level Groundwater pumping increasing and removing resources	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Mesquite Spraying on Adjacent Lands Cooperation with the Canadian River Water Management Authority Adjacent Agricultural Use Erosion/Siltation into Lake Meredith Management Actions of CRMWA Lowering of the Lake Level Groundwater pumping increasing and removing resources Implementation of the GMP
Soundscapes and the Acoustic Environment	National Recreation Area Boundary, plus Adjacent Land	Development of the Oil and Gas Management Plan Sand Drags event	Implementation of the Oil and Gas Management Plan Sand Drags event Development of the GMP	Implementation of the Oil and Gas Management Plan Sand Drags event Implementation of the GMP

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Wildlife and Wildlife Habitat	National Recreation Area Boundary, plus Adjacent Land	Development of the Resources Management Plan Development of the Fire Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan Texas Wildlife Action Plan Hunting Invasive Species Removal Mesquite Spraying on Adjacent Lands Damming of Canadian River	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Texas Wildlife Action Plan Hunting Invasive Species Removal Mesquite Spraying on Adjacent Lands Development of the GMP Lower Lake Level Changing Available Natural and Recreation Resources in the Area Decline of Cottonwoods in the National Recreation Area and Region (related to lack of water)	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Texas Wildlife Action Plan Hunting Invasive Species Removal Mesquite Spraying on Adjacent Lands Lower Lake Level Changing Available Natural and Recreation Resources in the Area Decline of Cottonwoods in the National Recreation Area and Region (related to lack of water) Implementation of the GMP
Threatened and Endangered Species / Species of Concern	National Recreation Area Boundary, plus Adjacent Land	Same as “Wildlife and Wildlife Habitat”	Same as “Wildlife and Wildlife Habitat”	Same as “Wildlife and Wildlife Habitat”
Archeological Resources	National Recreation Area Boundary, plus Adjacent Land	Development of the Resources Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan	Implementation of the Resources Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Development of the GMP	Implementation of the Resources Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the GMP

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Visitor use and Experience / Health and Safety	National Recreation Area Boundary, plus Adjacent Land	Development of the Resources Management Plan Development of the Fire Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan Development of the Oil and Gas Management Plan Texas Off-Highway Vehicle Program Visitor Study Final Technical Report – Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument Hunting Ongoing Maintenance Activities Sand Drags event Boat Fees for Visitors	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the Oil and Gas Management Plan Texas Off-Highway Vehicle Program Hunting Ongoing Maintenance Activities Sand Drags event Boat Fees for Visitors Development of the GMP Removal of Trash Cans on State Property	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the Oil and Gas Management Plan Texas Off-Highway Vehicle Program Hunting Ongoing Maintenance Activities Sand Drags event Boat Fees for Visitors Removal of Trash Cans on State Property Implementation of the GMP Multi-Use Trail Establishment Implementation of User Fees for Other Areas of Lake Meredith National Recreation Area

Impact Topic	Study Area	Past Actions	Present Actions	Future Actions (life of plan/EIS)
Lake Meredith Recreation Area Management and Operations	National Recreation Area Boundary, plus Adjacent Land	Development of the Resources Management Plan Development of the Fire Management Plan ORV Use Prior to the National Recreation Area Development of the Lake Meredith National Recreation Area Master Plan Development of the Oil and Gas Management Plan Texas Off-Highway Vehicle Program Hunting Invasive Species Removal Ongoing Maintenance Activities Sand Drags event Boat Fees for Visitors Demolished and Replaced Comfort Station to Meet ADA Requirements Replaced Fixtures at Three Comfort Stations with Water-Saving Models Replaced Roof on Visitor Contact Station and Maintenance Facility Replaced HVAC System in Ranger Station	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the Oil and Gas Management Plan Texas Off-Highway Vehicle Program Hunting Invasive Species Removal Ongoing Maintenance Activities Sand Drags event Boat Fees for Visitors Development of the GMP Removal of Trash Cans on State Property Emergency Services Partnerships	Implementation of the Resources Management Plan Implementation of the Fire Management Plan Implementation of the Lake Meredith National Recreation Area Master Plan Implementation of the Oil and Gas Management Plan Texas Off-Highway Vehicle Program Hunting Invasive Species Removal Ongoing Maintenance Activities Sand Drags event Boat Fees for Visitors Removal of Trash Cans on State Property Emergency Services Partnerships Implementation of the GMP Multi-Use Trail Implementation of User Fees for other areas of Lake Meredith National Recreation Area

RELATIONSHIP TO OTHER LAKE MEREDITH NATIONAL RECREATION AREA PLANNING DOCUMENTS, POLICIES, AND ACTIONS

Development and Implementation of the 1998 Fire Management Plan—The objectives of the 1998 fire management plan are to protect life, property, and resources from wildfire; use prescribed fire to accomplish resource management objectives; avoid unnecessary effects of fire management operations to prevent adverse impacts from fire management activities; and prevent wildfires. Components of these objectives that would cumulatively contribute to the effects of ORV use in the recreation area include reducing woody species to protect sensitive resources; perpetuating the natural occurrence of native vegetation ecosystems and restoring the landscape to the natural, pre-Anglo settlement prairie setting that existed before livestock grazing; and preventing unplanned human-caused ignitions. Specific actions to be taken under the fire management plan include the reduction of hazardous fuels such as woody vegetation through mechanical removal and prescribed fires, during which times closures and campfire limitations could be imposed. These actions could variously impact ORV user activities occurring at the park unit.

Development and Implementation of the Oil and Gas Management Plan—In September of 2002, an Oil and Gas Management Plan was approved for the Lake Meredith National Recreation Area with the purpose of addressing the issues of how the NPS can recognize the rights of private mineral owners to develop their oil and gas estates while also ensuring the protection of park resources and values, ensuring public safety, and minimizing conflicts with visitors and park management. A central component to the implementation of the Oil and Gas Management Plan has been the designation of all areas of the park as Special Management Areas with specific operating stipulations applied to oil and gas development. ORV use is a contributing factor to vegetation disturbances, which are also brought about by site clearing for oil and gas development. Road clearing from oil and gas development can also contribute to the proliferation of user-created ORV trails in areas of the park unit that were previously undisturbed. Through the effective management of oil and gas development as a result of the Oil and Gas Management Plan, however, the park is able to better protect its resources from the varying uses of lands in the park unit.

Development of a General Management Plan—The draft GMP for Lake Meredith National Recreation Area was published and open for public comment in January 2013, with the final GMP still under development at the time of this writing. A key feature of the plan is to determine ways to expand visitor opportunities at the national recreation area in response to changing conditions at the park, such as the variability of the lake water level in recent years. The park is exploring methods to improve existing recreation and introduce new activities at the national recreation area. The NPS identified alternative 3 as the preferred alternative in the draft GMP. Under alternative 3, management of Lake Meredith National Recreation Area would promote both traditional and nontraditional uses, providing development of facilities and opportunities to address changing lake conditions and visitor uses. It would become a destination for semi-primitive outdoor recreation opportunities for a broad range of skill levels. The national recreation area would strengthen partnership opportunities that employ science-based resource management and compatible land management uses to improve visitor experience and wildlife habitat. This alternative further identifies Rosita Flats and Blue Creek as ORV use areas, with management following this plan/EIS.

Boat Fees for Visitors—Lake Meredith National Recreation Area assesses annual boat launch fees of $40, three-day fees of $10, and a 1-day fee of $4. The boat launch fees fund boating safety improvements at launch ramps and waterways. Any vessel that requires a state registration number is subject to the fee. Many visitors that use the national recreation area take advantage of multiple opportunities. Those visitors would need to pay multiple fees if an alternative was selected that included ORV fees, therefore this item was considered during this plan/EIS.

Implementation of the Multi-use Trail—In 2010, an environmental assessment was completed for a plan to construct a non-motorized, multi-use recreational trail along the eastern portion of Lake Meredith. Along with the construction of the multi-use trail, the plan will install interpretive signs, kiosks, bike racks, and trash receptacles. The multi-use trail will consist of five phases of primitive trails totaling approximately 22 miles in length and will be available for pedestrian and bicycle use. The trail will not enter the Rosita Flats ORV use area. However, portions of the proposed multi-use trail would be located in areas open to hunting, and the use of ORVs has been a popular means of transportation for visitors engaging in hunting in the recreation area. As a result, there may be interactions between pedestrian users of the trail and ORV users.

Invasive Species Removal—Currently, invasive species removal efforts are being concentrated in high visitor use areas including near the Sanford-Yake and Fritch Fortress boat ramps, Cedar Canyon, on the Harbor Bay East Trail, and the Mullinaw Trail. Removal activities include hand application of herbicides and some minor mechanical removal (mowing). Actions that would increase or decrease the amount of invasive species in the recreation area would impact these operations.

Ongoing Maintenance Activities—These activities include maintenance of roads, paths, buildings, campgrounds, boat ramps, ORV use areas, and other facilities in the national recreation area. Typical maintenance activities also include repair of facilities, maintenance of lawns and other vegetation, trash removal, and installation of new amenities. These activities can have impacts on recreation area staff by requiring time and resources, as well as the potential for ground disturbance which can impact vegetation and soils. The level of maintenance also impacts visitor use and experience because the appearance and functionality of facilities improves the visitor experience, providing beneficial impacts to visitors.

Decline of Cottonwoods in the Recreation Area—In recent years, the number of cottonwoods in the recreation area has declined. Mainly, this decline can be attributed to the reduction in the amount of available water. This decline impacts the habitat available to wildlife, including threatened and endangered species, as well as vegetation by altering the available habitat in the area.

Cooperation with the Canadian River Management Authority—The recreation area cooperates with the Canadian River Management Authority to manage resources in the area. Recent examples of this cooperation include the 2009–2010 aerial application of herbicide for tamarisk removal and the Canadian River channel revitalization project. These efforts have beneficial impacts on natural resources in the area, and require recreation area staff time for coordination.

Lowering of Lake Level—Water levels in Lake Meredith have been steadily dropping over the past 10 years. The current depth of the lake is 43.59 feet (as of August 5, 2014). The record high depth was 101.85 feet (April 1973) and the record low was 26.14 feet (August 7, 2013). The lowering of the lake levels have been due to many factors such as lack of rain fall in the watershed and pumping for local use (CRMWA n.d.). One of the main factors in the lake level decline has been the spread of salt cedar. This plant spreads quickly and requires a lot of water, impacting lake levels. Lower lake levels impact visitor use and experience because low lake levels do not allow for many water-dependent activities (such as boating). As these visitor opportunities decrease, visitors look for opportunities in other parts of the recreation area. Lower lake levels also mean a reduced water supply for the surrounding area, impacting water resources as well as reducing the water and habitat available for wildlife, including threatened and endangered species.

Hunting Activities—Hunting occurs at various times throughout the year within the recreation area including in Blue Creek and Rosita Flats. Game species within the recreation area include dove, turkey, quail, duck, goose, and whitetail and mule deer. Each species has a specific season for which hunting can occur, ranging from late September to December, with turkey season extending into March. Hunting is one of the many visitor activities at the recreation area that contribute to and could impact the visitor experience. Management of the hunting program has the potential to impact park operations and management, because staff time and resources are needed for administration.

Demolish and Replace Comfort Station to meet ADA Requirements, Replace Fixtures at the Three Comfort Stations with Water Saving Models, Replace Room on the Visitor Centers Contact Station and Maintenance Facility, and Replace HAVC System in Ranger Station—Multiple visitor improvement projects have been conducted at the recreation area. These projects had a short-term impact on park operations (due to resource requirements) and long-term impacts on upkeep, with long-term beneficial impacts to the visitor experience from improved facilities.

Emergency Services Partnership—The recreation area has partnerships with Hutchinson County, Potter County, Moore County, and Fritch Emergency Management Service. These partnerships can put additional requirements on recreation area staff, but the partners can assist the recreation area when needed.

Implementation of User Fees for the Recreation Area—The ongoing GMP process discusses the potential for user fees related to ORV and campground utility hookups. Additional user fees may be implemented at a later date, but would require a feasibility study before implementation.

RELATIONSHIP TO OTHER STATE AND LOCAL PLANNING DOCUMENTS, POLICIES, ACTIONS, LAWS, AND REGULATIONS

ORV Use Prior to the National Recreation Area—Prior to the establishment of the Sanford River Project in 1965, the Canadian River and Blue Creek riparian area were utilized by the local community for recreational use. Lake Meredith was created by the construction of Sanford Dam in the early 1960s for the purpose of impoundment and diversion of water for 11 municipalities located in the Texas panhandle. Over the next decade, two ORV areas were designated under special regulation 36 CFR 7.57. Since that time, the use of the two ORV areas has caused extensive erosion and vegetation damage to the hillsides of Rosita and erosion of trail at the Bull Taco Hill area. The Blue Creek off-road use area has incurred comparatively less damage.

Amarillo Sand Drags—Amarillo sand drags is a competitive ORV drag racing event that began in the 1980s and is hosted by local ORV organizations. Held every February, the event attracts thousands of spectators and hundreds of motorcycles, four wheelers, sand rails, and river buggies on state lands adjacent to Rosita Flats. Drivers of these vehicles compete against one another in ORV races. Although the event itself is held on state-owned lands, the event's increasing popularity has resulted in spill-over effects on parklands outside the main event grounds. There is a substantial increase in visitor use at Lake Meredith associated with this annual event, and this dramatic increase in visitation necessitates greater law enforcement and park management services, while the increased intensity of ORV use has the potential to negatively affect soils and other natural resources from the spill over use.

Land and Water Resources Conservation and Recreation Plan—In 2005, the TPWD developed the Land and Water Resources Conservation and Recreation Plan, which identifies priorities for recreation on land, cites growing urban population and limited public land access as a threat to public outdoor recreation, and establishes the following goals and objectives that are particularly relevant to how ORV use is managed on public lands: promote and expand outdoor recreational activities; promote awareness and support of safe and responsible use of the outdoors; and identify opportunities to expand outdoor recreation, water access, hunting, and fishing on both public and private lands and waters. The plan also identifies the Canadian River Basin as a target for needed in-streamflow studies to evaluate river and stream systems in order to determine the appropriate flow regimes necessary to conserve fish, wildlife, and recreational resources. The results of these studies may lead to modifications to the management of the watershed and implications for recreational uses in the park unit.

Damming of the Canadian River Project—The construction of the Canadian River Project began under the authority of the BOR with the award of the construction contract for Sanford Dam in February 1962. Lake Meredith, the artificial reservoir created by Sanford Dam, has a total capacity of 1,382,500 acre-feet. The reservoir currently provides flood control, fish and wildlife, recreation, and municipal and industrial water supply. The damming of the Canadian River, while providing for the benefits of municipal and industrial water supply, recreation, and flood control, incurs the cost of all water impoundment projects in the form of direct effects on the natural riverine systems and aquatic life existing prior to dam construction. Continued ORV use can contribute incrementally to the further deterioration of riparian habitat, which has already been impacted by changes from the predisturbance flow regime.

Management Actions of the Canadian River Water Management Authority—Upon the completion of Sanford Dam, the Texas Legislature created the CRMWA for the purpose of providing a source of municipal and industrial water for the following 11 member cities that it serves: Amarillo, Brownfield,

Borger, Lamesa, Levelland, Lubbock, O'Donnell, Pampa, Plainview, Slaton, and Tahoka. The CRMWA Board of Directors is made up of 17 members appointed to two-year terms by the member cities. The Board meets once every quarter to set policy, review progress on major activities and issues, and authorize large expenditures and projects. Ongoing projects of the CRMWA include the Salt Cedar Management Program, which aims to increase flow in the Canadian River and its tributaries within the Lake Meredith watershed, increase water quality in the Canadian River, and create better habitat for the federally listed Arkansas River shiner. Continued ORV use at Lake Meredith, combined with management actions such as the Salt Cedar Management Program that remove woody vegetation, can contribute to further bank destabilization and erosion.

Mesquite Spraying on Adjacent Lands—Past land uses practices on adjacent lands have included spraying of mesquite. To park staffs knowledge, spraying is not a current practices, rather plants are pulled and removed. How mesquite is addressed depends on the land owners' preference. Activities on adjacent lands that use spraying could impact water quality in the recreation area. The presence of mesquite on adjacent lands could also impact the recreation area by spreading from those areas into Lake Meredith National Recreation Area.

Damming of the Canadian River—Damming of the Canadian River limits water availability in other areas. This can create impacts to threatened and endangered species, such as the Arkansas River shiner, in other areas such as New Mexico.

Adjacent Agriculture—Agricultural practices on adjacent lands mainly include grazing and calf/cow operations. Waste produced from these operations could impact water resource in the recreation area through runoff into nearby water bodies.

Erosion/Siltation into Lake Meredith—In general, erosion and siltation from surrounding land uses has contributed to lower lake levels in the recreation area. This impacts water resources, wildlife, vegetation, and visitor use and experience.

Groundwater Pumping—Although not currently occurring, historical pumping of groundwater in the region has contributed to lower lake levels, impacting natural resources, as well as visitor use and experience.

Removal of Trash Cans from State Property—The removal of trash cans from the state property adjacent to Rosita Flats has resulted in an increased demand for trash receptacles in the recreation area. This impacts park operations but increasing duties related to trash management and removal at this site.

SOILS

Section 4.8.2.4 of the NPS *Management Policies 2006*, "Soil Resource Management," states that the NPS will "actively seek to understand and preserve the soil resources of park units, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil or its contamination of other resources" (NPS 2006b). NPS *Management Policies 2006* further states that management actions will be taken to prevent or minimize potentially irreversible adverse impacts on soils.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

Impacts on soils were assessed by determining the types and current conditions of the soils in ORV use areas and evaluating the extent to which motorized vehicle access would cause potential impacts in the ORV use areas. This included an assessment of the potential beneficial effects of closing certain routes/areas to motorized vehicle access, as well as the potential adverse effects of allowing ORV use on

designated routes and areas. The study area for this analysis is composed of the two areas located within the boundaries of Blue Creek and Rosita Flats. Because 8 of the 13 soil associations identified within the two ORV use areas of Lake Meredith National Recreation Area exhibit moderate to severe erosion hazard on roads and routes, erosion is the primary issue analyzed. Other effects from disturbance, such as soil compaction and removal, are also addressed. The definitions for the intensity of an impact are as follows:

Negligible: The management and operation of ORVs would not cause discernible alteration (physical disturbance/removal, compaction, or unnatural erosion of soils) to the soils in the national recreation area. The alteration of soil resources would be so slight that their ability to sustain biota and water quality would not be affected.

Minor: The management and operation of ORVs would cause localized or limited alteration (physical disturbance/removal, compaction, or unnatural erosion of soils) to soils in the national recreation area. The alteration of soils would affect their ability to sustain biota and water quality, such that mitigation may be needed to offset adverse effects and would be relatively simple to implement and would likely be successful.

Moderate: The management and operation of ORVs would cause alteration (physical disturbance/removal, compaction, or unnatural erosion of soils) to soils in the national recreation area. The alteration of soil resources would affect their ability to sustain biota and water quality, such that mitigation measures would be necessary to offset adverse effects and they would likely be successful.

Major: The management and operation of ORVs would cause substantial alteration (physical disturbance/removal, compaction, or unnatural erosion of soils) to soils in the national recreation area. The alteration of soil resources would have a lasting effect on the ability of soils to sustain biota and water quality, such that mitigation measures to offset adverse effects would be needed, they would be extensive, and their success could not be guaranteed.

Duration: Short-term—Impacts would last less than three years.

Long-term—Impacts would last more than three years.

Study Area

The study area for this topic is defined as the lands contained within the boundaries of Rosita Flats and Blue Creek ORV use areas for the analysis of the impacts of the alternatives and defined as Lake Meredith National Recreation Area and adjacent land for the analysis of cumulative impacts. ORV use could occur throughout Blue Creek along the creek bottom from cutbank to cutbank and throughout Rosita Flats below the 3,000-foot elevation line. Together, these ORV use areas constitute less than 20 percent or one-fifth of the total national recreation area.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, the management of ORV use and access at the national recreation area would be a continuation of management based on the 2007 *Interim OHV Use Plan* (NPS 2007a), the regulations in 36 CFR 7.57, and the Superintendent's Compendium (NPS 2008d).

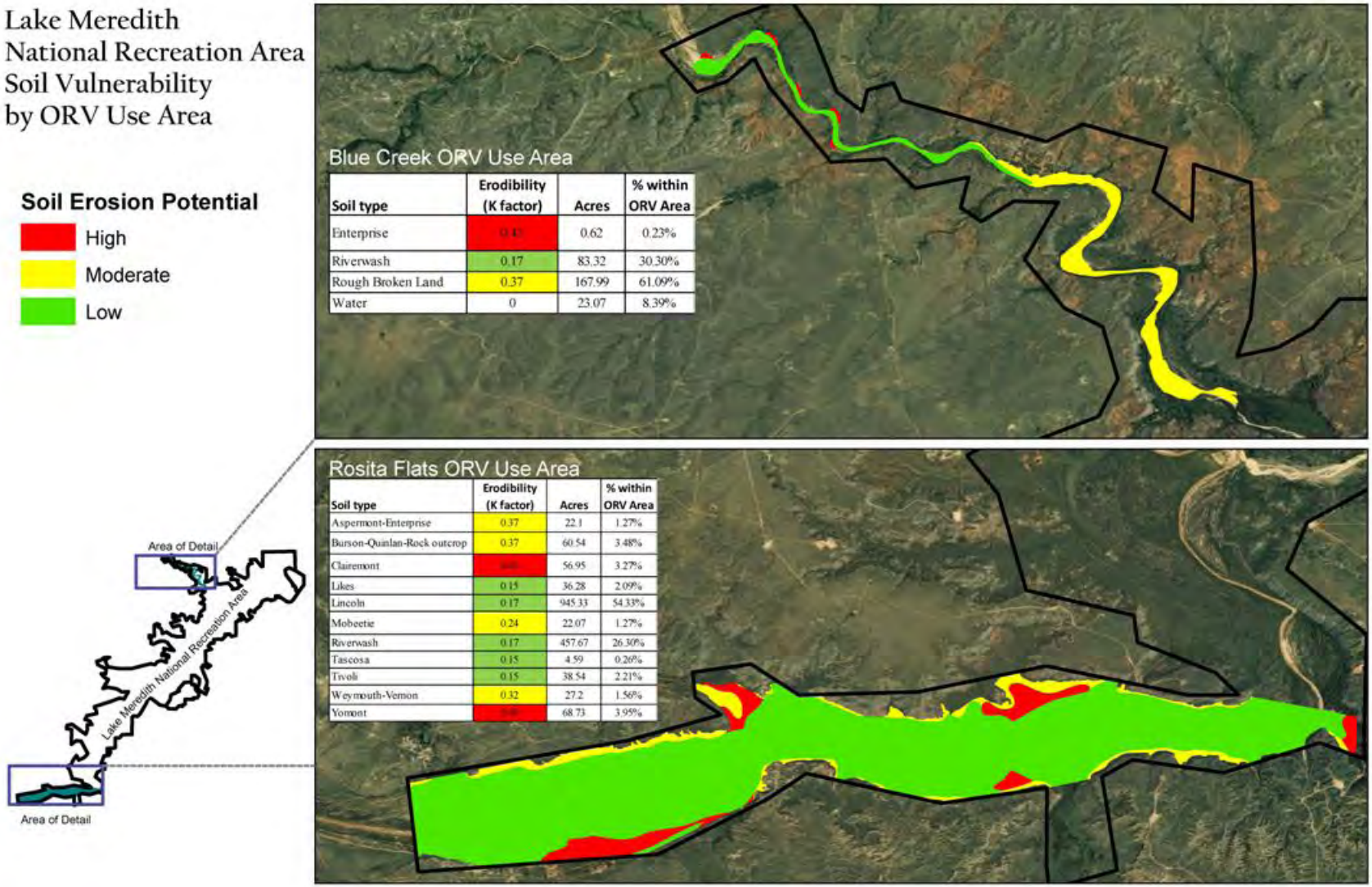
Blue Creek ORV Use Area

Under alternative A, soils in the ORV use area would continue to be affected through ongoing erosion and compaction from vehicles operating directly on the soil substrate, with no routes or areas designated for use. Soil compaction decreases soil permeability, which contributes to more highly channelized runoff during storm events and corresponding erosion of adjacent areas. Moreover, in the absence of designated ORV routes, direct impacts from ORVs could result in the loss of vegetation, which would also result in higher erosion potential. Other recreational activities, such as camping in vegetated areas, would similarly continue to result in disturbance and damage to soils through compaction and erosion. The primary soil type in the northwestern portion of the ORV use area is riverwash, which is a deep, sandy material that occupies the bottom of dry stream channels. Riverwash constitutes approximately 30 percent of the total ORV use area and has a low erosion potential, with a K factor of 0.17 (see figure 25). Common ORV use resulting in physical changes to the streambed, such as tire ruts and gouges, would not result in permanent physical alterations of this sandy bottom, which can return to predisturbance conditions over a short period of time. Because riverwash constitutes the most prevalent soil type in the area between cutbanks in the northwestern portion of the use area, surface disturbances would be contained to the extreme edges of the cutbanks, where very minute portions of highly erodible (K factor of 0.43) Enterprise soils are found, and the southeastern portion of the ORV use area, which is characterized by rough broken land having a moderate erosion potential, with a K factor of 0.37. ORV use in the southeastern portion of the ORV use area, which constitutes approximately 60 percent of the total ORV use area, would be particularly prone to impacting this more sensitive soil substrate.

No routes or areas would be established, the allowable ORV use area (cutbank to cutbank) would not be marked, and posts or other physical markers would not be installed to contain ORV use to specific areas. This would result in continuing impacts throughout Blue Creek, because operators would be able to easily traverse the entire area with no restrictions. Additionally, this would result in a larger “footprint” of impacts on soils when compared to alternatives that designate routes and areas. These impacts would be more severe as a result of higher vehicle speeds due to the lack of speed limits. By contrast, ongoing ORV use among national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts on soils because such use is subject to strict regulation of speeds and constrained whenever possible to designated routes. Notable surface disturbances from the use of ORVs at high speeds over a large area and not constrained to designated routes would be readily apparent in these marginal portions of the use area and would result in additional compaction and erosion, causing substantial alteration of soils without the employment of extensive mitigation. As a result, adverse impacts on soils in the Blue Creek ORV use area would be localized, long term, and major.

Rosita Flats ORV Use Area

Under alternative A, soils in the Rosita Flats ORV use area would continue to be affected by ongoing disturbances similar to those at the Blue Creek ORV use area. Other recreational uses, such as camping in vegetated areas, would continue to result in disturbance and damage to soils through compaction and erosion. Approximately 15 percent of the soils in the Rosita Flats ORV use area are classified as having moderate or high erosion potential, and these soils are located along the edges of the ORV use area (figure 25). Because the 3,000-foot elevation line would remain unmarked, there would be ongoing uncertainty about where ORV use would be allowed, resulting in continued impacts on these more sensitive soils. In the absence of extensive mitigation measures, these adverse effects would continue to be readily apparent in these portions of the use area, which would affect the ability of soils to sustain biota and water quality. The implementation of alternative A would result in localized long-term major adverse impacts on soils in the Rosita Flats ORV use area.



Soil type	Erodibility (K factor)	Acres	% within ORV Area
Enterprise	[illegible]	0.62	0.23%
Riverwash	0.17	83.32	30.30%
Rough Broken Land	0.37	167.99	61.09%
Water	0	23.07	8.39%

Soil type	Erodibility (K factor)	Acres	% within ORV Area
Aspermont-Enterprise	0.37	22.1	1.27%
Burson-Quanlan-Rock outcrop	0.37	60.54	3.48%
Clairemont	[illegible]	56.95	3.27%
Likes	0.15	36.28	2.09%
Lincoln	0.17	945.33	54.33%
Mobeetie	0.24	22.07	1.27%
Riverwash	0.17	457.67	26.30%
Tascosa	0.15	4.59	0.26%
Tivoli	0.15	38.54	2.21%
Weymouth-Vernon	0.32	27.2	1.56%
Yomont	[illegible]	68.73	3.95%

FIGURE 25: LAKE MEREDITH NATIONAL RECREATION AREA SOIL VULNERABILITY BY OFF-ROAD VEHICLE USE AREA

Cumulative Impacts

Other past, present, and future planning actions at the national recreation area have the potential to adversely and beneficially affect soils at both ORV use areas. ORV use occurring prior to the establishment of the national recreation area has resulted in major impacts on soils in the ORV use area and periphery. Under alternative A, soils would be adversely affected by ongoing maintenance activities throughout the national recreation area, such as roadway maintenance and invasive species management, which may involve the removal of vegetation, cause soil compaction and rutting, reduce permeability, and increase erosion. Thus, impacts on soils from maintenance activities would be expected to continue under alternative A. These actions have the potential to result in localized long-term minor adverse impacts on soils.

In addition to actions with negative effects on soils, some actions would have beneficial effects. Plans specifically related to ORV use that could contribute to soil impacts include the Resources Management Plan (NPS 1996), which provides goals for the national recreation area that address preserving national recreation area resources. The national recreation area is currently developing a GMP that will articulate the long-term vision that will guide management of the national recreation area for the next 15 to 20 years. The decision to develop a GMP is, in part, a response to changes in the recreation opportunities at Lake Meredith because of changes in the lake level. During the planning process, the NPS will explore different approaches to preserve the important recreational opportunities, natural resources, and cultural histories of the national recreation area (NPS 2009k). Upon implementation of the plan, the national recreation area would manage natural resources, including soils, in a manner consistent with laws, NPS policy, and standards. The development and implementation of these plans would, over time, result in improving resource protection aspects through regulatory mechanisms. These changes could have long-term beneficial impacts on soils due to improving resource protection practices.

Overall, the impacts of these past, present, and future actions would be long term, minor, and adverse. When combined with the localized long-term major adverse impacts of alternative A, these actions would result in long-term moderate adverse cumulative impacts on soil resources.

Conclusion

Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized major adverse impacts on soils. Incremental contributions to soil erosion would be most notable at the extreme edges of the cutbanks and the eastern extent of the Blue Creek ORV use area and at the edges of the Rosita Flats ORV use area. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term major adverse impacts of alternative A, would result in long-term moderate adverse cumulative impacts on soil resources.

Impacts of Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes

Alternative B would institute a zoning system, in addition to designated routes and areas, that would further manage ORV use. Established zones could include camping-only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones. A no-charge ORV permit system would also be implemented where the permits could be revoked if riders are found off designated routes.

Blue Creek ORV Use Area

Under alternative B, the establishment of a zone system and separation of visitor uses would promote resource protection at Blue Creek by limiting impacts to discrete portions of the use area. Although

intensification of disturbances would occur in designated camping zones, these impacts would potentially be mitigated by prohibiting camping outside these areas. Speed limits of 15 mph in camping zones and a low-speed zone near the highway bridge would further reduce impacts from vehicle-caused soil erosion and compaction. Surface disturbances would be contained to already-disturbed portions of the ORV use area. As a result of this protection, vegetation throughout Blue Creek would be less vulnerable to damage and removal and would provide an erosion control function through root structure and the effect of wind diffusion. Educational measures would provide long-term beneficial impacts on soils from increased awareness and behavior modification among ORV users. Ongoing ORV use among national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts on soils because such use is subject to strict regulation of speeds and constrained whenever possible to designated routes. The implementation of a permit system in which riders found off route would have their permits revoked would create an incentive to comply, thereby reducing impacts on soils. As a result, adverse impacts on soils in the Blue Creek ORV use area would be localized, long term, and moderate.

Rosita Flats ORV Use Area

Under alternative B, the establishment of a zone system and separation of visitor uses would promote resource protection at Rosita Flats. Intensification of uses at certain areas would impact soils at those locations. For instance, the proposed beginner zone and designated camping zones would together overlie 14 acres of highly erodible Yomont- and Clairemont-type soils. However, long-term beneficial impacts would potentially result from the establishment of a resource protection zone that would prohibit vehicles with a wheel width greater than 64 inches from driving on approximately 1,040 acres of soils, 172 acres (17 percent) of which are classified specifically within the resource protection zone as highly erodible. Moreover, post -and -cable fencing would be installed to define specific zones under this alternative. During the installation of the post and cable materials, there would be limited disturbances to soils, resulting in localized short-term moderate adverse impacts on soils. These impacts would need to be mitigated by using least damaging methods during installation, such as digging post holes rather than trenches and tamping to ensure that soils are compacted to control runoff. Once established, this boundary would create a containment area, reducing impacts on soils outside the established zone. Consequently, long-term beneficial impacts would result from the establishment of the zone system because areas outside various use zones or outside designated routes and areas would receive less disturbance. Educational measures would provide beneficial impacts on soils from increased awareness and behavior modification among ORV users. Ongoing ORV use among national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts on soils because such use is subject to strict regulation of speeds and constrained whenever possible to designated routes. In combination with educational outreach, the implementation of a permit system in which riders found off route would have their permits revoked would create an incentive to comply. Speed limits of 15 mph in camping zones would further reduce impacts from vehicle-caused soil erosion and compaction. Overall, adverse impacts on soils in the Rosita Flats ORV use area would be localized, long term, and moderate.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential for impacts on soils under alternative B would be identical to those under alternative A: impacts would be localized, long term, minor, and adverse. In combination with the localized long-term moderate adverse impacts of alternative B, cumulative impacts on soils would be localized, long term, moderate, and adverse.

Conclusion

Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from educational measures provide increased awareness and behavior modification among ORV users. Incremental contributions to soil erosion would result from the intensification of uses in certain areas, such as the proposed beginner zone and designated camping areas, and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative B, would result in long-term moderate adverse cumulative impacts on soils.

IMPACTS OF ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of an ORV user capacity. Permits would include a fee and initially there would be no limit on the number of permits issued. Fees from the permits would be used to add amenities to the ORV use areas, including pit toilets, fire rings, and picnic tables. ORV routes and areas would be the same as those established under alternative B, except there would be no designated ORV use area east of Bull Taco Hill.

Blue Creek ORV Use Area

Under alternative C, the establishment of an ORV route system for the Blue Creek ORV use area would discourage further disturbance in areas where a high probability of impacts on soils through erosion exists. These routes would be established on already-disturbed user-created ORV trails. As a component in determining the precise location of ORV use routes and areas, resource characteristics such as soil erodibility will be taken into consideration, and areas with highly erodible soils will be avoided to the extent possible as part of the revised management scenario under alternative C. Other user -created trails would not be designated as routes and would be allowed to recover naturally. Restrictions would also be placed on camping, which would be permitted only on designated camping sites located in already-disturbed areas, thereby eliminating impacts on soils from camping outside these areas. Impacts on soils, which would be of high intensity and occur over the long-term life of the management plan, would be contained within camping areas.

Under alternative C, the establishment of a user-fee permit system, while placing no strict limit on entry, would potentially reduce the amount of visitation and place a lesser burden on the landscape, thereby reducing impacts on soils. Contingent valuation studies (Turpie 2003) have found that a willingness to pay for conservation measures is positively correlated with an active interest in nature-related activities, suggesting that national recreation area users who pay entry may be more keenly interested in the maintenance of national recreation area resources for those purposes.

Moreover, alternative C would retain the option of limited entry if a study of use limits determined that such an option was warranted. The prospect of limited visitation would promote resource protection at the Blue Creek ORV use area. Further, added benefits to soils would accrue from the establishment of a permit system in which ORV use permits would be revoked in the case of users driving off route, as well as from the establishment of speed limits (35 mph on routes and 55 mph on the sandy river bottom). Educational measures such as “tread lightly” pamphlets would provide beneficial impacts on soils from increased awareness and behavior modification among ORV users. Overall, these expanded resource protection measures would result in long-term beneficial impacts on soils under alternative C by reducing

and containing the extent of soil erosion. Soils would continue to be impacted in portions of the ORV use area where travel is still permitted. However, due to the sandy nature of soils in the riverwash portion of the ORV use area, these impacts would not be detectable throughout most of the ORV use area and would cause very little or no physical disturbance when compared with current conditions. Thus, the implementation of expanded resource protection measures under alternative C would result in localized long-term moderate adverse impacts on soils in the Blue Creek ORV use area.

Rosita Flats ORV Use Area

Under alternative C, the establishment of a user-fee permit system, while placing no strict limit on entry, would potentially reduce the amount of visitation, which would place a lesser burden on the landscape, thereby reducing impacts on soils. Moreover, alternative C would retain the option of limited entry if a study of use limits determined that such an option was warranted. The prospect of limited visitation would promote resource protection at the Rosita Flats ORV use area. Impacts on soils would potentially be mitigated by the establishment of use restrictions such as hike-in-only camping. Further, added benefits to soils would accrue from the establishment of a permit system in which ORV use permits would be revoked in the case of users driving off route. Educational measures such as “tread lightly” pamphlets would provide beneficial impacts on soils from increased awareness and behavior modification among ORV users. Hardening of the route surface for improved access to the ORV use area at Rosita Flats would result in impacts from compaction of soils. Similarly, intensification of uses at discrete locations within the ORV use area would impact soils at those locations. For instance, the proposed ORV use area and designated camping sites in Rosita Flats under alternative C would together overlie 14 acres of highly erodible Yomont- and Clairemont-type soils. However, some impacts on soils would likely be mitigated by restrictions on vehicle entry to camping locations because, with the exception of one drive-in campground, access to campsites would be available on foot only. According to Wilson and Seney (1994), foot traffic generally creates less disturbance in terms of erosion on dry soils than motorized vehicles[1]. Thus, impacts on soils would potentially be mitigated by the establishment of use restrictions such as hike-in-only camping. Overall, adverse impacts on soils in the Rosita Flats ORV use area would be localized, long term, and moderate.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential for impacts on soils under alternative C would be identical to those under alternative A: impacts would be localized, long term, minor, and adverse. In combination with the localized long-term moderate adverse impacts of alternative C, cumulative impacts on soils would be localized, long term, moderate, and adverse.

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[1] Horses produced significantly larger quantities of sediment compared to hikers, off-road bicycles, and motorcycles; the greatest sediment yields occurred on wet trails. Different trail uses result in different erosion rates, presumably because different users exert different forces. Weaver and Dale (1978) also compared motorcycle erosion with horse and foot erosion. Motorcycles moving uphill established a narrow rut which increased the velocity and sediment transport capacity of trail runoff. The development of this linear channel was the direct result of the imprint of the tire and the torque applied by the motorcycle which then led to increased erosion. However, motorcycles moving downhill, when torque is not needed, caused less erosion than hikers and horses which tend to loosen soil when descending a steep trail because greater forces are applied when decelerating and moving down a steep trail.

Conclusion

Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in localized long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses at certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in-only camping. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative C, would result in long-term moderate adverse cumulative impacts on soils.

IMPACTS OF ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

Alternative D would establish a fee-based permit system as well as instituting a zoning system to manage ORV use. The permit system would include a fee and there would be no limit on the number of permits issued. Fees from the permits would be used to add amenities to the ORV use areas, including pit toilets, fire rings, and picnic tables. ORV use zones established under this alternative could include camping-only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones.

Blue Creek ORV Use Area

Under alternative D, the establishment of a zone system and separation of visitor uses would promote resource protection at Blue Creek ORV use area by limiting impacts to discrete portions of the use area. Any intensification of disturbances occurring as a result of designated camping areas in Blue Creek would potentially be mitigated by the establishment of no-camping zones around vegetated areas. Speed limits in camping zones and a low-speed zone near the highway bridge, although primarily intended to improve visitor safety, would have the secondary effect of further reducing impacts from vehicle-caused soil erosion and compaction by containing the area of disturbance and reducing the occurrence of rutting from vehicles travelling at higher speeds. Surface disturbances would be contained to previously-disturbed portions of the ORV use area. As a result of this protection, vegetation throughout the use area would be less vulnerable to damage and removal and would provide an erosion control function through root structure and the effect of wind diffusion.

Ongoing ORV use by national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts on soils because such use is subject to strict regulation of speeds and constrained to designated routes whenever possible.

Use limits would not be established under alternative D. However, the implementation of a permit system in which riders found off route would have their permits revoked would create an incentive to comply, thereby reducing impacts on soils in protected areas.

Educational measures such as “tread lightly” pamphlets would provide beneficial impacts to soils from increased awareness and behavior modification among ORV users. As documented by Bogner (1998), environmental education programs can effectively provoke favorable shifts in individual behavior toward more pro-environmental orientations. Thus, increased environmental protection can be achieved through educational outreach. Measures such as increased awareness and behavior modification among ORV users would result in beneficial impacts to soils.

As a result of these improvements to ORV use management under alternative D, adverse impacts on soils in the Blue Creek ORV use area would be localized, long term, and minor to moderate.

Rosita Flats ORV Use Area

Under alternative D, the establishment of a zone system and separation of visitor uses would promote resource protection at the Rosita Flats ORV use area by limiting impacts to discrete portions of the use area. Although intensification of disturbances would occur as a result of designated camping areas, these impacts would potentially be mitigated by the establishment of no-camping zones around vegetated areas. Speed limits of 15 mph in camping zones, although primarily intended to improve visitor safety, would have the secondary effect of further reducing impacts from vehicle-caused soil erosion and compaction by containing the area of disturbance and reducing the occurrence of rutting from vehicles travelling at higher speeds. Surface disturbances would be contained to previously disturbed portions of the ORV use area. As a result of this protection, vegetation throughout the use area would be less vulnerable to damage and removal and would provide an erosion control function through root structure and the effect of wind diffusion.

Ongoing ORV use by national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts to soils because such use is subject to strict regulation of speeds and constrained to designated routes whenever possible.

Use limits would not be established under alternative D. However, the implementation of a permit system in which riders found off route would have their permits revoked would create an incentive to comply, thereby reducing impacts to soils in protected areas.

Educational measures such as “tread lightly” pamphlets would provide beneficial impacts to soils from increased awareness and behavior modification among ORV users. As documented by Bogner (1998), environmental education programs can effectively provoke favorable shifts in individual behavior toward more pro-environmental orientations. Thus, increased environmental protection can be achieved through educational outreach. Measures such as increased awareness and behavior modification among ORV users would result in beneficial impacts to soils.

As a result of these improvements to ORV use management under alternative D, adverse impacts on soils in the Rosita Flats ORV use area would be localized, long term, and minor to moderate.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential for impacts on soils under alternative D would be identical to those under alternative A: impacts would be localized, long term, minor, and adverse. In combination with the localized long-term minor to moderate adverse impacts of alternative D, cumulative impacts on soils would be localized, long term, minor to moderate, and adverse.

Conclusion

Under alternative D, continued ORV use and management at Blue Creek and Rosita Flats would result in localized long-term minor to moderate impacts. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses in certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of no-camping zones around vegetated areas. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term minor to moderate adverse impacts of alternative D, would result in long-term minor to moderate adverse cumulative impacts on soils.

VEGETATION

GUIDING REGULATIONS AND POLICIES

The Organic Act of 1916 (16 USC 1) and NPS *Management Policies 2006* (NPS 2006b) direct parks to provide for the protection of park resources. NPS *Management Policies 2006* (NPS 2006b) states that the NPS will minimize human impacts on native plants (and animals); their populations, communities, and ecosystems; and the processes that sustain them (Section 4.4.1). In addition, NPS *Management Policies 2006* prohibits the displacement of native species by nonnative species if displacement can be prevented (Section 4.4.4). Recognizing the influence of external factors on natural resources in the park, Section 4 of NPS *Management Policies 2006* (NPS 2006b) also calls for the NPS to protect natural resources by working cooperatively with federal, state, and local agencies; tribal authorities; user groups; adjacent landowners; and others to identify and achieve broad natural resource goals.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

Past vegetation classification data and maps showing vegetation cover in Lake Meredith National Recreation Area were used to identify baseline conditions in the study area. Based on discussions with Lake Meredith and other NPS staff, vegetation types were grouped into 11 map units as described in the "Vegetation" section of "Chapter 3: Affected Environment." Digital maps of the alternatives and vegetation were analyzed using geographical information system (GIS) software to evaluate which vegetation types could be affected by open ORV routes and ORV use areas. Comparisons were then made between alternative A (no action) and alternatives B, C, and D (the action alternatives) to determine whether there was a difference in vegetation communities with open ORV routes / use areas. In addition, potential indirect impacts were assessed, such as the potential for ORV use to introduce seeds of nonnative vegetation, or create other conditions suitable for the establishment of nonnative species.

Because NPS *Management Policies 2006* (NPS 2006b) requires the NPS to minimize not only impacts on individual native plants, but also on their populations, communities, ecosystems, and the processes that sustain them, the definitions for impact intensity for vegetation consider all such effects, as follows:

Negligible: No native vegetation would be affected or some individual native plants could be affected in localized areas. The abundance or distribution of vegetation would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.

Minor: The alternative would affect the abundance or distribution of individual native plants in a localized area, but would not affect the viability of local or regional populations or associated communities. Mitigation, such as revegetation and weed control, to offset adverse effects would be necessary and would be effective.

Moderate: The alternative would affect some individual native plant communities and the loss or disturbance of vegetation would be readily noticeable and measurable. Ecological and biological productivity would be disrupted in the disturbed area. Mitigation, such as revegetation and weed control, to offset adverse effects would be necessary and would likely be successful.

Major: The alternative would have a considerable effect on native plant populations and would affect a relatively large area. Mitigation measures to offset the adverse effects would be required and would be extensive, and the success of the mitigation measures would not be guaranteed.

Duration: Short-term—Impacts would last less than one year.

Long-term—Impacts would last more than one year.

Study Area

The area of analysis for direct and indirect effects on vegetation, including cumulative impacts, is the Blue Creek and Rosita Flats ORV use areas.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Alternative A would continue managing ORVs as currently managed under the 2007 *Interim OHV Use Plan* (NPS 2007a) and regulations contained in the Superintendent's Compendium. ORV use would continue to be permitted throughout Rosita Flats below the 3,000-foot elevation line and at Blue Creek along the creek bottom from cutbank to cutbank.

Blue Creek ORV Use Area

Under alternative A, impacts on vegetation would occur within the 275 acres authorized for ORV use in and along the creek bottom (cutbank to cutbank) at Blue Creek. Motorized travel on vegetation, whether inadvertent or intentional, creates damage to the resource. As a result, allowing open ORV use under alternative A without designating specific routes or areas has resulted in the area generally being devoid of vegetation due to ORV use over the years.

Impacts identified in a study of ORV travel in western states (Wilshire, Shipley, and Nakata 1978) included the crushing of foliage, stems, root systems, and seedlings; uprooting of small plant cover; and disruption of root systems of larger plans. This study also noted that ORV travel has even destroyed juniper trees more than 10 feet (3 meters) tall. These impacts have been documented to occur not only where vehicles directly contact vegetation, but also beyond the vehicle track width (Wilshire, Shipley, and Nakata 1978; Lathrop 1983). Although some studies in arid environments have documented loss of vegetation with a small number of passes by ORVs (Wilshire 1983; Webb 1983), others have shown that the more pronounced effects occur in localized areas as a result of concentrated use (such as heavy weekend use) (Lathrop 1983).

Other vegetation impacts would result from erosion and physical changes to soils that occur from ORV travel in Blue Creek and Rosita Flats (see "Soils" analysis in this chapter). Erosion creating gullies can undercut and cause the loss of vegetation, including plants lost when soil from surrounding high spots erodes and deposits into low spots. Additional runoff resulting from the loss of vegetation (either directly or from erosion) is commonly diverted in unused slopes, which can increase erosion and subsequent loss of vegetation in nearby areas that are not even open to ORV use. Ultimately, the deposition of the eroded materials buries vegetation, causing further plant loss (Wilshire, Shipley, and Nakata 1978).

The loss of more-fertile layers of the soil, as well as the reduction in productivity, adds to the impacts on vegetation by slowing the restoration of disturbed areas (Wilshire, Shipley, and Nakata 1978). In arid

environments, such as those at Lake Meredith, natural recovery of disturbed areas can take many years, which would not occur with ongoing ORV use in all areas of Blue Creek. In one study in Nevada, partial recovery of vegetation—which was primarily nonnative species—and associated soil cover took a minimum of one year (Webb 1983). In addition to the impacts on soils, tire tracks and ruts at the river bottom or creek beds, consisting mainly of grasslands and cottonwoods, result from ORV use at Blue Creek. These tracks and ruts recover during flooding events, although floods are now very rare. Trees in the riparian areas suffer from their roots becoming exposed by vehicle traffic close to the trunks.

In addition to impacts associated with damage to vegetation, ORV use in the national recreation area also has the potential to introduce or spread nonnative plants. Literature reviewed for this plan/EIS addressed both the effects of roads on the spread of invasive species and the potential for seed transport. Gelbard and Belnap (2003) documented that roads and associated environmental disturbances contributed to the spread of invasive species in semiarid grasslands, shrublands, and woodlands of southern Utah, although cover and nonnative species richness was lower near four-wheel-drive tracks than paved roads. A study conducted by the Montana Weed Control Association (Trunkle and Fay 1991) documented the dispersal of plant material from the undercarriage of vehicles, including spotted knapweed (*Centaurea stoebe*) seeds. The results of the study indicated that spotted knapweed seeds are readily disseminated by motor vehicles over long distances. Another study (Rooney 2005) compared soil samples taken from the undercarriages of motorized vehicles to field surveys for seven invasive species in forested areas of Wisconsin. The study found that ORV use may occasionally contribute to long-distance dispersal events. Similarly, researchers investigated the potential for seed transport into Kakadu National Park, Australia, by tourist vehicles. The study identified a low density of seeds on vehicles, and concluded that vehicles were partially responsible for weed seed dispersal but that this did not warrant preventive measures (Osborn et al. 2002). Continued ORV use at the national recreation area has the potential to spread invasive species throughout Blue Creek. Saltcedar, found at Blue Creek, is an invasive species at Lake Meredith. It is managed by first being removed, then burned, followed by being sprayed with an herbicide. Hundreds of acres of saltcedar are managed at the national recreation area.

The active management of nonnative plants, and any efforts required to offset their introduction or spread as a result of ORV use, would likely be successful. The barren areas, altered plant communities, and presence of nonnative vegetation are indicators of the moderate long-term adverse impacts on vegetation associated with ORV use at Blue Creek.

Rosita Flats ORV Use Area

Under alternative A, impacts on vegetation would occur within the 1,740 acres designated for ORV use below the 3,000-foot elevation line at Rosita Flats. Conditions and effects of ORV use at Rosita Flats are the same as those found at Blue Creek. While the same vegetation types are found at Rosita Flats as at Blue Creek, emergent vegetation is found in low-lying areas that may be inundated by lake-level fluctuations and populated with reeds, rushes, cattails, and other vegetation. According to Caudle (1983), Rosita Flats is subject to flooding once or twice a year. Although flooding still occurs, recent years have been dominated by drought conditions and have resulted in historically low water levels; however, vegetation communities still exist. ORV use in the area below the high water line has the potential to cause damage and loss of plants, especially if vehicles get stuck in vegetated areas. However, recovery would occur by the next growing season as a result of the periodic inundation of the area as river levels fluctuate. Periodic inundation restricts ORV use, allowing these areas to recover. Areas above the water line that support other plants would take more time to recover from ORV travel without designated routes, whether intentional or not, because these areas would always be open to ORV use. Areas on the edge of the ORV boundary are made up of soils with higher erosion potential than those found at Blue Creek. Higher erosion potential increases the likelihood for the creation of gullies and enhances the

likelihood of water runoff. These characteristics have the potential to remove vegetation and impede further vegetation growth, both of which can be seen at Rosita Flats.

The active management of nonnative plants, and any efforts required to offset their introduction or spread as a result of ORV use, would likely be successful. The barren areas, altered plant communities, and presence of nonnative vegetation are indicators of the moderate long-term adverse impacts on vegetation associated with ORV use at Rosita Flats.

Cumulative Impacts

The use of ORVs at Lake Meredith began before the national recreation area designated the areas of Blue Creek and Rosita Flats exclusively for their use in the 1970s. Since then, the national recreation area has allowed ORV use only in these two areas. The implementation of closures documented in the Resource Management Plan (NPS 1996) has provided protection for vegetation because ORV use is allowed only in Blue Creek and Rosita Flats. The Resource Management Plan provides goals for the national recreation area that address preserving national recreation area resources, including vegetation, and ensuring organized effectiveness. The national recreation area is currently creating a GMP. Under this plan Lake Meredith will manage natural resources, including vegetation, in a manner consistent with law, NPS policy, and standards. The plan will also identify resource protection zones in the recreation area. Management plans would result in long-term minor adverse effects on vegetation.

Wildland fires have historically played an important role in the area ecosystem. Fires can alter plant population and change resource availability. The Wildland Fire Management Plan (NPS 1998b) for Lake Meredith National Recreation Area is the primary reference for conducting all fire management activities and is intended to help achieve the resource management objectives as presented in the resource management plan. Protection of natural resources, including vegetation and their associated processes, is one of the highest priorities of the plan. This plan is based on a strategy that uses prescribed burns and mechanical methods to remove excess fuel from the system, which would reduce the likelihood of major fires. Fire is a valuable tool for perpetuating native plant life and maintaining or restoring indigenous flora and natural communities to achieve species diversity and community structure similar to those that would occur under natural conditions. The effects of fire management activities on vegetation would be short term, adverse, localized, and minor, with long-term effects being parkwide and beneficial.

Saltcedar (also known as tamarisk) is an invasive plant that occurs throughout Texas and extensively infests the national recreation area. It is estimated that one large saltcedar can use 200 gallons of water per day or 1 acre can use 3 to 7 acre-feet of water per year (TSSWCB 2009). Saltcedar has become common along the streambanks of the Canadian River and its tributaries (CRMWA 2005). There is anecdotal evidence that saltcedar infestations in and around Lake Meredith have reduced the inflow of runoff water from rainfall into the lake. In addition to direct water use of these plants by transpiration, heavily infested floodplain areas tend to trap floodwaters so that losses are greatly increased. Saltcedar also draws salts up to the surface from deep in the soil, increasing the salinity of the streamflow (CRMWA 2005). In 2002, the Entomology Program at the Texas A&M Research and Extension Center began a cooperative effort with the BOR to develop a biological-control program for saltcedar at Lake Meredith. In 2004, as part of a research study, planned releases of *Diorhabda elongata*, a chrysomelid beetle that is an aggressive defoliator of saltcedar, were carried out at two sites in Lake Meredith National Recreation Area. The NPS conducted aerial spraying in late August 2008 on a total of 5,298 acres. Herbicide was applied in an area starting at the southwest boundary of the national recreation area on the Canadian River at Rosita to the Sanford Dam. This treatment included the lakebottom (predrought) and much of the entire shoreline (Wimer 2009b). The aerial spraying was completed in September 2009. Treatment for saltcedar and other nonnative plants will continue by handcrews. Managers of lands adjacent to the national recreation area spray mesquite to help control the invasive plants. Lake Meredith benefits from this because it helps

hinder the spread of the invasive vegetation. The impacts from the use of invasive species removal on vegetation would be short term, minor to moderate, and adverse, with long-term effects on native vegetation being beneficial.

Cottonwoods have declined in the national recreation area as well as in the region as a whole. This is due to a lack of water. A reduction of cottonwoods may lead to native vegetation and invasive species incorporating the areas that were once inhabited by cottonwoods. The overall decline and loss of cottonwoods results in long-term minor adverse impacts on vegetation. However, the potential inhabitance of the area by native vegetation results in long-term beneficial impacts. If the area were inhabited by invasive species, the effects on vegetation would be long term, negligible to minor, and adverse.

Another plant known for its competitive botanical edge in the desert landscape is mesquite (Sharp n.d.). Overgrazed rangelands, openings, and other clearings and areas once dominated by native grasses often become infested with mesquite, which dominates that landscape over time (TPWD 2007). As with saltcedar, mesquite is fire-adapted, making fire management (via prescribed burns) difficult for land managers (Sharp n.d.). Managers of lands adjacent to the national recreation area spray mesquite, which benefits the national recreation area by preventing further spread of invasive vegetation.

As water levels continue to decrease at Lake Meredith, the national recreation area would likely explore additional forms of recreation for visitors to enjoy, including the recent plan to construct a recreational multi-use trail (NPS 2010c) and expand existing non-aquatic recreation activities. A potential increase in ORV use and other non-aquatic recreational activities due to low water levels in the national recreation area could contribute to the adverse impacts of ORVs on vegetation.

Throughout the national recreation area, regularly scheduled maintenance activities are conducted to maintain facilities and ensure visitor safety. These maintenance activities contribute to potential impacts on vegetation. These activities have involved infrastructure maintenance and upkeep, such as ensuring water quality and access. Regular repairs to roads and concrete ramps have also occurred on a continuing basis. Regular park facility maintenance occurs continually at Lake Meredith. Effects on vegetation through maintenance activities would likely be short term, negligible to minor, and adverse, because the majority of maintenance would occur on already disturbed vegetation.

The 2002 Oil and Gas Management Plan for Lake Meredith National Recreation Area (NPS 2002a) was prepared for the purpose of guiding the management of activities associated with the exploration and development of nonfederal oil and gas in the national recreation area. The Oil and Gas Management Plan (NPS 2002a) identifies those park resources and values most sensitive to oil and gas exploration and development disturbance, and defines impact mitigation requirements to protect such resources and values. To protect park resources and values, the plan establishes performance standards for oil and gas exploration and development, and it provides pertinent information to oil and gas owners and operators to facilitate compliance with applicable regulations. As of 2002, there were 170 active nonfederal oil and gas operations in the national recreation area. The construction and operation of these facilities has the potential to create short- and long-term minor to moderate adverse impacts.

The overall impact of these past, current, and future actions on vegetation would be long term, minor to moderate, and adverse. When combined with the long-term moderate adverse impacts under alternative A, long-term moderate adverse cumulative impacts on vegetation in the area of analysis would result.

Conclusion

Localized short- and long-term moderate adverse effects on vegetation would occur under alternative A as a result of localized impacts, including damage to plants; erosion, which can result in further loss of vegetation; reduction in soil productivity, which can affect natural recovery; and the potential introduction or spread of nonnative plants. The parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the localized short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in localized long-term moderate adverse cumulative impacts on vegetation.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system. One purpose would be the separation of visitor uses that have the potential to conflict with one another. Established zones could include camping -only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones.

Alternative B would also include a no-charge permit system, in which permits would be issued to ORV users after they read educational materials. The NPS would revoke the permits if riders are found off designated routes. If a rider violates the rules in any of the ORV use areas three times, the rider would be permanently barred from receiving any kind of public use permit at the national recreation area. Increased resource protection (such as temporary closures of the ORV use areas) and enforcement of ORV rules (such as implementation of permits) would result in long-term benefits for vegetation.

At Blue Creek and Rosita Flats, the installation of post -and -cable fencing to delineate various ORV zones could lead to localized short-term negligible to minor adverse impacts on vegetation. Visitor use within designated camping zones at both areas would have negligible adverse effects on vegetation, because camping areas would already be disturbed.

Blue Creek ORV Use Area

Under alternative B, ORV use would only be allowed on sandy bottom areas and on designated routes at Blue Creek, and ORVs would be prohibited from operating on any vegetation. Designated routes would be marked, likely with carsonite posts. The installation of these posts would lead to short-term negligible adverse impacts on vegetation.

Vegetation in these designated areas includes yucca grassland, mesquite grassland, mixed grassland, unconsolidated shore, mixed forest, bare land, vegetated cliffs, riverine grassland, disturbed grassland, and emergent scrub/shrub. Because ORV use would be restricted to designated routes and areas and would not be allowed to occur on vegetated terrain, impacts on these vegetation communities would likely be negligible and adverse.

By limiting ORV use to designated routes, vegetation in previously disturbed areas no longer designated would have the opportunity to recover and impacts would be long term and beneficial. In the location of ORV routes and areas, or for any vegetation that exists in designated routes and sandy bottoms, impacts would be short and long term, minor, and adverse. Additionally, long-term beneficial impacts on vegetation would result from the establishment of a resource protection zone, because vegetation in these areas would have the opportunity to recover.

Because alternative B would include a zoning system, no-charge permit system, and increased resource management, the overall impact of alternative B on vegetation at Blue Creek would be expected to be long term, minor, and adverse. Adverse impacts would be localized along open ORV routes and use areas due to continued disturbance along those routes.

Rosita Flats ORV Use Area

Under alternative B, ORV use at Rosita Flats would be allowed on currently denuded land and on designated marked routes where there has been extensive ORV use previously. Because of this, additional damage to vegetation and soils in these areas would not be expected. Routes and areas designated for ORV use under alternative B at Rosita Flats would occur in the following vegetation types: yucca grassland, mesquite grassland, mixed grassland, unconsolidated shore, mixed forest, bare land, vegetated cliffs, riverine grassland, disturbed grassland, emergent vegetation, and emergent scrub/shrub. Impacts on vegetation would be long term, minor, and adverse because ORV use would be restricted to already disturbed areas or specific routes.

The proposed low-speed ORV “beginner” zone is a well-established ORV loop route, and further damage to vegetation would not be expected.

Impacts from vehicles with a wheel width less than 64 inches in the proposed resource protection zone would be short and long term, negligible, and adverse stemming from the continued vehicle use. Long-term beneficial impacts would occur from the prohibition of larger vehicles and the subsequent preservation of vegetation species. Posts marking routes and posts and cables marking ORV use areas would have effects on vegetation similar to those previously described: short term, negligible, and adverse.

Because alternative B would include a zoning and permit system, designated access points at the riverbed at Rosita Flats, and increased resource management and law enforcement, the overall impact of alternative B on vegetation at Rosita Flats would be expected to be long term, minor, and adverse. Adverse impacts would be localized along open ORV routes and use areas due to continued disturbance along those routes.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential for impacts on vegetation under alternative B would be identical to those under alternative A: impacts would be parkwide, long term, minor to moderate, and adverse. In combination with the localized long-term minor adverse impacts of alternative B, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.

Conclusion

Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. These adverse impacts would occur in fewer vegetated areas under alternative B because more of the land would be closed to ORVs compared to under alternative A. The designation of ORV routes and areas would allow previously disturbed vegetated areas the opportunity to recover. As a result, there would be long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.

IMPACTS OF ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Under alternative C, the national recreation area would manage ORV use through a permit system and through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except that there would be one designated ORV use area in Rosita Flats instead of two.

The requirements of the permit system would increase visitor recognition of vegetation and educate visitors on proper ORV use and the effects of ORVs on vegetation. These educational requirements of the permit system would create a sense of ownership of the national recreation area for ORV users and leave an avenue open for possible revocation of permits if these rules are violated, resulting in long-term beneficial impacts.

The implementation of educational signs and a “tread lightly” pamphlet for ORV use would inform visitors of the effects of ORVs on vegetation, resulting in long-term beneficial impacts from an increase in visitor knowledge and awareness. An ORV use limit would be implemented based on indicators and standards developed through the GMP process. The development of a use limit would result in long-term benefits for vegetation by limiting the number of vehicles in the ORV use areas and reducing disturbance of habitat. Overall impacts from the permit system, the use limit, and education and outreach efforts would be long term and beneficial, with further beneficial impacts on vegetation if future permits are restricted.

Blue Creek ORV Use Area

ORV use under alternative C would incorporate the same routes and areas as described under alternative B, and ORV use on vegetation would be prohibited. The following vegetation types are in the Blue Creek area: yucca grassland, mesquite grassland, mixed grassland, unconsolidated shore, mixed forest, bare land, vegetated cliffs, riverine grassland, disturbed grassland, and emergent scrub/shrub. However, because ORV use would be restricted to designated routes and areas and would not be allowed on vegetated terrain, impacts on these vegetation communities would likely be negligible and adverse.

Limiting ORV use to sandy bottom areas and designated routes would allow vegetation in previously disturbed areas where ORV use is no longer designated the opportunity to recover; impacts would be long term and beneficial. In the location of ORV routes/areas, or for any vegetation that exists in designated routes and sandy bottoms, impacts would be short and long term, minor, and adverse.

In addition to established routes at Blue Creek, alternative C would also involve the designation of camping sites. Each campsite would be designated, rather than just a large area as under alternative B, and would have amenities such as a fire ring and a picnic table. Although the camping sites are previously disturbed, vegetation still exists and further camping at these sites would result in short-term negligible to minor adverse impacts on vegetation. In addition, the potential installation of an interpretive wayside exhibit program at Blue Creek, as funding and permit fees allow, could result in short-term negligible adverse impacts on vegetation.

Because alternative C would include use limits, a fee-based permitting system, an interpretive wayside program, and increased resource protection, the overall impact of alternative C on vegetation at Blue Creek would be expected to be long term, minor, and adverse. Adverse impacts would be localized along open ORV routes and use areas due to continued disturbance along those routes.

Rosita Flats ORV Use Area

ORV use at Rosita Flats under alternative C would incorporate the same routes and areas as alternative B. However, under alternative C, ORV use at Rosita Flats would be restricted to a designated area south of the river, where extensive ORV use is currently allowed, and to other designated ORV routes. Additionally, the area east of Bull Taco Hill would not be a designated ORV use area, further reducing the area impacted.

Open ORV routes and use areas under alternative C at Rosita Flats would occur in the following vegetation types: yucca grassland, mesquite grassland, mixed grassland, unconsolidated shore, mixed forest, bare land, vegetated cliffs, riverine grassland, disturbed grassland, emergent vegetation, and emergent scrub/shrub. However, because ORV use would be limited in Rosita Flats, impacts on vegetation would be long term, minor, and adverse.

Limiting ORV use at Rosita Flats would allow vegetation in previously disturbed areas that are no longer designated the opportunity to recover; impacts would be long term and beneficial.

Because alternative C would include use limits, a fee-based permitting system, designated access points at the riverbed at Rosita Flats, and increased resource protection and law enforcement, the overall impact of alternative C on vegetation would be expected to be long term, minor, and adverse. Impacts would be localized along open ORV routes and use areas due to continued disturbance along those routes.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential for impacts on vegetation under alternative C would be identical to those under alternative A: impacts would be parkwide, long term, minor to moderate, and adverse. In combination with the localized long-term minor adverse impacts of alternative C, cumulative effects on vegetation would be parkwide, long term, minor, and adverse.

Conclusion

Localized short- and long-term minor adverse impacts on vegetation would occur in areas open to ORV use. However, there would be impacts in fewer vegetated areas because several areas would be closed to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.

Impacts of Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas

Under alternative D the national recreation area would, in part, base the designation of routes and areas on a zoning system. One purpose would be the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee -permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area, but no use limits would be established.

As described under alternative C, the fee-based permit system would ultimately exclude ORV riders who were caught repeatedly violating the resource protection rules. The permit system would also seek to educate ORV users about ORV rules and resource protection. For these reasons, the fee-based permit system would benefit vegetation in the national recreation area over the long term.

Blue Creek ORV Use Area

Under alternative D, ORV routes and areas at Blue Creek would occur in places containing the following vegetation types: yucca grassland, mesquite grassland, mixed grassland, unconsolidated shore, mixed forest, bare land, vegetated cliffs, riverine grassland, disturbed grassland, and emergent scrub/shrub. However, ORV use would be restricted to approved routes and trails, and would not be allowed to occur on vegetated terrain outside marked routes. As a result, vegetation outside designated routes and areas would have the opportunity to recover, resulting in long-term beneficial impacts.

As described under alternative B, ORV use would only be permitted on sandy bottom areas and designated routes at Blue Creek; zones would be established for camping. Impacts on vegetation from continued ORV use in designated routes and areas would be short and long term, minor, and adverse. As described for alternative A, adverse impacts would be localized in the vicinity of routes and areas open to ORV use and would not be expected to affect population numbers, ecological or biological processes, or the overall viability and stability of plant communities.

The potential installation of an interpretive wayside exhibit program at Blue Creek (as funding and permit fees allow) could result in short-term negligible adverse impacts on vegetation from removal of and damage to vegetation during the construction and use of the exhibits.

Because alternative D would include a zoning system, a fee-based permitting system, an interpretive wayside program, and increased resource protection, the overall impact of alternative D on vegetation at Blue Creek would be expected to be long term, minor, and adverse as well as long term and beneficial. Adverse impacts would be localized along open ORV routes and use areas due to continued disturbance along those routes.

Rosita Flats ORV Use Area

Under alternative D, the management of ORV use would include zones as described for alternative B and a permit system as described for alternative C. The use of zones, as described for alternative B, would result in continued ORV activities in areas that are currently extensively used. Continued ORV use in these areas would result in long-term minor adverse impacts. The use of a permit system at Rosita Flats, as described for alternative C, would result in ORVs being restricted to areas south of the river, where use is already extensive. Impacts on vegetation would be long term, minor, and adverse in this area. The restriction of ORV use through a permit system and zones would result in long-term beneficial impacts on previously disturbed areas by providing vegetation in those areas the opportunity to recover.

Other elements associated with alternative B that are also present in alternative D include the installation of post -and -cable fencing and signs around the ORV boundary, leading to short-term negligible to minor adverse impacts on vegetation. In addition, the existing road leading to designated camping areas would be improved; however, because the area is previously disturbed no further effects on vegetation would occur.

Because alternative D would include a zoning system, a fee-based permitting system, designated access points at the riverbed at Rosita Flats, and increased resource protection and law enforcement, the overall impact of alternative D on vegetation at Rosita Flats would be expected to be long term, minor, and adverse. Impacts would be localized along open ORV routes and use areas due to continued disturbance along those routes.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions with the potential for impacts on vegetation under alternative D would be identical to those under alternative A: impacts would be parkwide, long term, minor to moderate, and adverse. In combination with the localized long-term minor adverse impacts of alternative D, cumulative effects on vegetation would be parkwide, long term, minor, and adverse.

Conclusion

Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. However, impacts would occur in fewer vegetated areas because only designated routes and specific areas would be open to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.

WATER RESOURCES

GUIDING REGULATIONS AND POLICIES

NPS *Management Policies 2006*, Section 4.6.1 (NPS 2006b), addresses water resource management and states that the NPS will perpetuate surface and groundwater as integral components of park ecosystems and avoid the pollution of park waters by human activities occurring in and outside the park units. The NPS will take all necessary actions to maintain or restore the quality of surface and groundwater in the park units in a manner consistent with all applicable regulations.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

The methodology used for assessing impacts on water resources was based on a review of existing data on the water quality of Lake Meredith and the vicinity. Impacts on waters of Lake Meredith could occur from land-based actions that affect water quality through runoff and sedimentation. The study area for this analysis is composed of the two areas located within the boundaries of Blue Creek and Rosita Flats. The intensity of impacts on water resources are defined as follows:

Negligible: Impacts would result in a change to water quality, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would result in a change to water quality, but the change would be of little consequence and localized. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Impacts would result in a change to water quality that would be measurable and localized. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful.

Major: Impacts would result in a change to water quality that would be measurable and would have substantial consequences on a regional scale. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Duration: Short-term—Impacts would last less than three years.

Long-term—Impacts would last more than three years.

Study Area

For the analysis of the impacts of the alternatives, the study for this topic is defined as the waters contained within the boundaries of Rosita Flats and Blue Creek ORV use areas and the slopes of the immediately surrounding vicinity. The study area for cumulative impacts is defined as Lake Meredith National Recreation Area and adjacent land. Sedimentation and runoff from continuing ORV use and directly related activities, such as hunting and camping, would potentially affect water quality in these tributary waters and the waters of greater Lake Meredith. ORV use could occur throughout Blue Creek along the creek bottom from cutbank to cutbank and throughout Rosita Flats below the 3,000-foot elevation line. Together, these ORV use areas constitute less than 20 percent or 1/5 of the total national recreation area.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, the management of ORV use and access at the national recreation area would continue current management strategies based on the 2007 *Interim OHV Use Plan* (NPS 2007a), the regulations contained in 36 CFR 7.57, and the Superintendent's Compendium (NPS 2008d).

Blue Creek ORV Use Area

ORV use at Blue Creek ORV use area would continue under the no-action alternative. Surface water quality in the ORV use area would continue to be impacted through ongoing disturbances under current management. Sedimentation of surface waters in Lake Meredith would continue to result from the ongoing erosion of soils due to ORV use. However, such impacts would be relatively limited in extent, because the most pronounced erosion would be contained to the extreme edges of the cutbanks and the eastern extent of the ORV use area (outside of water sources), which is characterized by soils having a moderate erosion potential.

Additionally, no ORV routes or use areas would be established, the allowable ORV use area (cutbank to cutbank) would not be marked, and no posts or other physical markers would be installed to limit ORV use to specific areas. This would result in continuing impacts throughout Blue Creek, because drivers would be able to easily traverse the entire area with no restrictions. Incremental contributions to existing surface water quality impairments (under the Clean Water Act) would result from runoff of MTBE, an additive blended with gasoline during the refining process that might leak from motor vehicles during operation. This pollutant may already be present in Lake Meredith due to the large amount of watercraft use. Water quality effects would be detectable in adjacent creeks and these impacts would continue under current conditions. As a result, adverse impacts on surface water quality in the Blue Creek ORV use area would be localized, long term, and moderate.

Rosita Flats ORV Use Area

ORV use at the Rosita Flats ORV use area would continue under the no-action alternative and surface water quality in the Rosita Flats ORV use area would continue to be affected through ongoing disturbances similar to those described for Blue Creek. Soils classified as having moderate or high erosion potential are located along the edges of the Rosita Flats ORV use area. Sedimentation of surface waters of

the national recreation area would continue to result from the ongoing erosion of soils due to ORV use. Incremental contributions to existing surface water quality impairments would also result from runoff of MTBE, as described previously. Water quality effects would be detectable in adjacent creeks and these impacts would continue under current conditions. As a result, adverse impacts on surface water quality in the Rosita Flats ORV use area would be localized, long term, and moderate.

Cumulative Impacts

Several past, present, and reasonably foreseeable future actions would result in adverse and beneficial cumulative impacts on water quality at both ORV use areas in the national recreation area. In the past, damming of the Canadian River and the long-term presence of agricultural land uses adjacent to the reservoir have negatively impacted water quality through surface water impoundment and introduction of chemical fertilizers and pesticides, as well as erosion and siltation into Lake Meredith. ORV use occurring prior to the establishment of the national recreation area resulted in impacts on water quality through runoff of leaked fuels and oils as well as the erosion of embankments, contributing to an increase in turbidity. Local and regional water resources would be adversely affected by the lowering of the lake level and groundwater pumping. These impacts on water quality are expected to continue, contributing to cumulative impacts over time. In an effort to control the spread of invasive saltcedar, the NPS conducted aerial spraying in late August 2008 on a total of 5,298 acres. Herbicide was applied in an area starting at the southwest boundary of the national recreation area on the Canadian River at Rosita, to the Sanford Dam. This treatment included the lakebottom (predrought) and much of the entire shoreline (Wimer 2009b) and was completed in September 2009. Treatment for saltcedar and other nonnative plants will continue by handcrews. These methods of control could result in short-term minor to moderate adverse impact on water quality at Lake Meredith (i.e., water degradation from herbicides). Overall, these actions have the potential to result in localized short- and long-term minor adverse cumulative impacts on water quality.

In addition to actions with adverse cumulative effects on water resources, there are also some actions with long-term beneficial cumulative impacts on water quality. For example, the management actions of CRMWA and the development and implementation of a national recreation area GMP will, over time, result in improving protection of water resources through the enforcement of regulatory policies and the development of programs to ensure that water quality standards are met and goals for the administrative district are achieved. Plans specifically related to ORV use that could contribute to cumulative impacts include the Resources Management Plan (NPS 1996), which provides goals for the national recreation area that address preserving national recreation area resources. As mentioned above, the national recreation area is currently developing a GMP that will articulate the long-term vision that will guide the management of the national recreation area for the next 15 to 20 years. The decision to develop a GMP is, in part, a response to changes in the recreational opportunities at Lake Meredith because of changes in the lake level. During the planning process, the national recreation area will explore different approaches to preserve the important recreational opportunities, natural resources, and cultural histories of the national recreation area (NPS n.d.c). Upon implementation of the GMP, the national recreation area will manage natural resources, including water quality, in a manner consistent with law, NPS policy, and standards.

The Wildland Fire Management Plan (NPS 1998b) is the primary reference for conducting all fire management activities and is intended to help achieve the resource management objectives as presented in the Resource Management Plan. The perpetuation of natural resources and their associated processes is one of the highest priorities for the plan, which is based on a strategy of using prescribed burns and mechanical methods to remove excess fuel from the system, reducing the likelihood of major wildfires and providing benefits to native vegetation. Fire management plans are considered a key tool in maintaining and improving current levels of grassland resources by promoting the restoration of uplands to native grasses and controlling brush such as mesquite (CRMWA 2005). Restoring the native

ecosystem's natural regime includes enhancing water filtration and soil stability. This would result in long-term beneficial impacts on water quality in the national recreation area.

The overall impact of these past, current, and future actions on water resources would be short and long term, minor, and adverse as well as long term and beneficial, and when combined with the localized long-term moderate adverse impacts of alternative A, would result in long-term minor adverse cumulative impacts on water resources.

Conclusion

Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized moderate adverse impacts on water quality due to ongoing disturbances under current management that would continue to impact surface water quality in the ORV use areas. Sedimentation of surface waters in Lake Meredith would continue to result from the ongoing erosion of soils due to ORV use. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative A, would result in long-term minor adverse cumulative impacts on water resources.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system, one purpose of which would be the separation of visitor uses that have the potential to conflict with one another. Established zones could include camping-only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones. A no-charge ORV permit system would also be implemented where the permits could be revoked if riders are found off designated routes.

Blue Creek ORV Use Area

Under alternative B, the establishment of a zone system and separation of visitor uses would promote protection of water resources at Blue Creek ORV use area. Although intensification of disturbances would occur in designated camping areas, these impacts would potentially be mitigated by the establishment of no-camping areas in vegetated areas. During the installation of carsonite posts to mark ORV routes and post -and -cable fencing to mark zones (such as camping zones), limited disturbances to soils would occur from the installation of materials, resulting in short-term adverse impacts on soils. However, once established, ORV use areas would be delineated, reducing the potential for erosion outside the established ORV routes and areas. Consequently, long-term beneficial impacts on water quality would result from the establishment of the zone system. The implementation of a permit system in which riders found off route would have their permits revoked would create an incentive to comply, thereby reducing impacts on water quality as users are directed away from areas more sensitive to erosion. As a result of these protections, vegetation throughout the use area would be less vulnerable to damage and removal and would provide an erosion control function through root structure and the effect of wind diffusion. Speed limits would lead to greater protections to water quality by protecting vegetation, which provides an erosion control function, from the higher likelihood of damage that can occur from vehicles operating at high speeds. Because the operation of ORVs at high speeds can also result in accelerated removal of soil substrate, speed limits of 15 mph in camping zones and a low-speed zone near the highway bridge would further reduce impacts from soil erosion and sedimentation on the nearby stream. While leakage of fuels, erosion, and sedimentation would continue to adversely impact water quality in portions of the ORV use area where travel is still permitted, disturbances would be contained to already-disturbed portions of the ORV use area. As a result, adverse impacts on water resources in the Blue Creek ORV use area would be localized, short to long term, and minor to moderate.

Rosita Flats ORV Use Area

Under alternative B, the establishment of a zone system and separation of visitor uses would promote resource protection at the Rosita Flats ORV use area. The establishment of a resource protection zone would prohibit vehicles with a wheel width greater than 64 inches from driving on approximately 1,040 acres of the Rosita Flats ORV use area, resulting in long-term benefits for water resources. Moreover, carsonite posts to mark ORV routes and post -and -cable fencing to mark zones (such as camping zones) would be installed under this alternative. Consequently, long-term beneficial impacts would accrue from the establishment of the zone system. Overall, adverse impacts on water resources in the Rosita Flats ORV use area would be localized, short to long term, and minor to moderate.

Cumulative Impacts

The effects of past, present, and reasonably foreseeable future actions on water resources would be as described for alternative A: short and long term, minor, and adverse as well as long term and beneficial. Overall, the impacts of these actions, when combined with the localized short- and long-term minor to moderate adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on water resources.

Conclusion

Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor to moderate adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on water resources.

Impacts of Alternative C: Management through Use of a Permit System at Current ORV Use Areas

Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. Fees from the permits would be used to add amenities to the ORV use areas, including pit toilets, fire rings, and picnic tables. ORV routes and areas would be the same as those established under alternative B, except there would be one designated ORV use area in Rosita Flats instead of two.

Blue Creek ORV Use Area

Under alternative C, revised management strategies for ORV use at Blue Creek would promote resource protection. The establishment of an ORV route system for the Blue Creek ORV use area would discourage further disturbance in sensitive portions of the ORV use area. These routes would be established on already-disturbed user-created ORV trails. Restrictions would also be placed on camping, which would be permitted only in already-disturbed areas of the use area. The implementation of a permit system in which riders found off route would have their permits revoked would create an incentive to comply, thereby reducing impacts on water quality as users are directed away from areas more sensitive to erosion. Further, the establishment of speed limits (35 mph on ORV routes and 55 mph on the sandy

river bottom) would lead to greater protections to water quality by protecting vegetation. Vegetation provides an erosion control function, which would be preserved under this alternative by protection vegetation from the higher likelihood of damage that can occur from vehicles operating at high speeds. Overall, these expanded resource protection measures would result in long-term beneficial impacts on water quality under alternative C by reducing and containing the extent of soil erosion and runoff into adjacent waters. Leakage of fuels, erosion, and sedimentation would continue to adversely impact water quality in portions of the ORV use area where travel is still permitted. However, these impacts would not be detectable throughout most of the ORV use area because they would cause very little or no physical disturbance when compared with current conditions. Thus, the implementation of expanded resource protection measures under alternative C would result in localized short-term minor to moderate adverse impacts on water resources in the Blue Creek ORV use area.

Rosita Flats ORV Use Area

Under alternative C, the establishment of a user-fee permit system, while placing no strict limit on entry, would potentially reduce the amount of visitation, which would place a lesser burden on existing resources, thereby reducing impacts on water quality. Moreover, alternative C would retain the option of limited entry if a study of user capacity determined that such an option was warranted. The prospect of limited visitation would promote resource protection at the Rosita Flats ORV use area. The intensification of visitor use in certain areas, such as the proposed ORV use area and designated camping areas, would impact resources at those locations. Further, leakage of fuels, erosion, and sedimentation would continue to adversely impact water quality in portions of the ORV use area where travel is still permitted. However, some impacts on water quality would likely be mitigated by restrictions on vehicle entry to camping locations, because under this alternative access to campsites (other than delineated campgrounds) would be available on foot only. Overall, adverse impacts on water resources in the Rosita Flats ORV use area would be localized, long term, and minor to moderate.

Cumulative Impacts

The effects of past, present, and reasonably foreseeable future actions on water resources would be as described for alternative A: short and long term, minor, and adverse as well as long term and beneficial. Overall, the impacts of these actions, when combined with the localized short- to long-term minor to moderate adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on water resources.

Conclusion

Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in short- to long-term localized minor to moderate adverse impacts on water resources. Impacts on water quality would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in -only camping. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on water resources.

Impacts of Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas

Under alternative D the national recreation area would, in part, base the designation of routes and areas on a zoning system, one purpose of which would be the separation of visitor uses that have the potential to

conflict with one another, similar to the system under alternative B. ORV use zones established under this alternative could include camping-only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones. In addition, a fee -permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area, but no use limits would be established.

Blue Creek ORV Use Area

Under alternative D, the establishment of a zone system and separation of visitor uses would promote the protection of water resources at Blue Creek ORV use area by limiting impacts to discrete portions of the use area. Although intensification of disturbances would occur in designated camping areas, these impacts would potentially be mitigated by the establishment of no-camping areas in vegetated areas. Because the operation of ORVs at high speeds can also result in accelerated removal of soil substrate, speed limits of 15 mph in camping zones and a low-speed zone near the highway bridge would lead to greater protections to water quality by protecting vegetation, which provides an erosion control function, from the higher likelihood of damage that can occur from vehicles operating at high speeds. A low-speed zone near the highway bridge would further reduce impacts from soil erosion and sedimentation on the nearby stream. While leakage of fuels, erosion, and sedimentation would continue to adversely impact water quality in portions of the ORV use area where travel is still permitted, disturbances would be contained to already-disturbed portions of the ORV use area.

Ongoing ORV use among national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts on water quality because such use is subject to strict regulation of speeds and constrained whenever possible to designated routes.

Although the establishment of use limits would not occur under alternative D, the implementation of a permit system in which riders found off route would have the potential to have their permits revoked would create an incentive to comply, thereby reducing impacts on water quality.

Educational measures such as “tread lightly” pamphlets would provide beneficial impacts on water quality from increased awareness and behavior modification among ORV users.

As a result of these improvements to ORV use management under alternative D, adverse impacts on water resources in the Blue Creek ORV use area would be localized, short to long term, and minor.

Rosita Flats ORV Use Area

Under alternative D, the establishment of a zone system and separation of visitor uses would promote resource protection at the Rosita Flats ORV use area. As described for alternative B, the establishment of a resource protection zone would prohibit vehicles with a wheel width greater than 64 inches from driving on approximately 1,040 acres of the Rosita Flats ORV use area, resulting in long-term benefits for water resources. Moreover, the installation of carsonite posts to mark ORV routes and post -and -cable fencing to mark zones (such as camping zones) would benefit water resources by ensuring that ORV users comply with established zones.

Although the establishment of use limits would not occur under alternative D, the establishment of a user-fee permit system would potentially reduce the amount of visitation, which would place a lesser burden on existing resources, thereby reducing impacts on water quality. Additionally, a permit system in which riders found off route could have their permits revoked would create an incentive to comply, further reducing impacts on water quality.

As stated for alternative C, fuel leakage, erosion, and sedimentation would continue to adversely impact water quality in portions of the ORV use area where travel is still permitted. However, some impacts on water quality would likely be mitigated by restrictions on vehicle entry to camping locations, because access to campsites (other than delineated campgrounds) would be available on foot only.

Ongoing ORV use among national recreation area personnel for law enforcement and other purposes would continue to result in less-than-substantial impacts on water quality because such use is subject to strict regulation of speeds and constrained whenever possible to designated routes.

Educational measures such as "tread lightly" pamphlets would provide beneficial impacts on water quality from increased awareness and behavior modification among ORV users.

As a result of these improvements to ORV use management under alternative D, adverse impacts on water resources in the Rosita Flats ORV use area would be localized, short to long term, and minor.

Cumulative Impacts

The effects of other past, present, and reasonably foreseeable future actions on water resources would be as described for alternative A: short and long term, minor, and adverse as well as long term and beneficial. Overall, the impacts of these actions, when combined with the localized short- to long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on water resources.

Conclusion

Under alternative D, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be offset by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on water resources.

SOUNDSCAPES AND THE ACOUSTIC ENVIRONMENT

GUIDING REGULATIONS AND POLICIES

The NPS Organic Act establishes and authorizes the NPS "to conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 USC 1). An intact natural soundscape enhances visitor experience and allows for natural functioning of wildlife communication.

Regarding general park soundscape management, NPS *Management Policies 2006*, Section 4.9, "Soundscape Management," requires that the NPS "preserve, to the greatest extent possible, the natural soundscapes of parks." Additionally, the NPS "will restore to the natural condition wherever possible those park soundscapes that have become degraded by the unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts" (NPS 2006b, Section 4.9). Director's Order 47: Soundscape Preservation and Management, was developed to emphasize NPS policies "that will require, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape

resource in a condition unimpaired by inappropriate or excessive noise sources." This director's order also directs park managers to measure acoustic conditions, differentiate existing or proposed human-made sounds that are consistent with park purposes, set acoustic goals based on the sounds deemed consistent with the park purpose, and determine which noise sources are impacting the parks (NPS 2000).

Additionally, 36 CFR 2.12, "Audio Disturbance," prohibits the operation of motorized vehicles in national parks in excess of 60 dBA at a distance of 50 feet from the source or, if below that noise level, noise that is unreasonable. Reasonableness is dependent on several factors, including the nature and purpose of the actor's conduct, location and time of occurrence, the park purpose, and the impact the noise has on park users (36 CFR 2.12).

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

Acoustics modeling was conducted to evaluate the potential impacts of the alternatives on natural soundscapes. A brief overview of the modeling methodology and assumptions is provided below. For additional detailed technical information, refer to the *Lake Meredith National Recreation Area Acoustic Monitoring and Modeling of Off-road Vehicles* (NPS 2011c).

Source Characterization

In order to model the noise emissions from a source, the source must first be characterized. Due to the number of different types of ORVs operating at Lake Meredith National Recreation Area, it was necessary to create a "composite source" to represent average noise emissions for modeling purposes. The composite source was developed based on noise monitoring 20 feet from the entrance to the Rosita Flats ORV use area and included ATVs, motorcycles(both two- and four-stroke engine types), and four-wheel-drive vehicles. Four-wheel -drive vehicles compose the majority of the ORVs entering the national recreation area. Figure 26 provides an example of some of the types of vehicles incorporated in the composite source.

For modeling purposes, three composite sources were developed:

- The Average Composite Source—This source represents the average of the measured ORV noise emissions.
- The Composite Source Plus One Standard Deviation (σ)—This composite represents the noise levels from ORVs with higher than average emissions. Approximately 16 percent of the ORVs would be expected to exceed this level. Modeling this level makes it possible to assess potential impacts from pass-bys of some of the loudest vehicles.
- 96 dBA Composite Source—For modeling of alternatives that incorporate a limit on ORV sound levels, a third composite source was created based on the proposed 96 dBA limit (measured 1.5 feet, or 0.5 meter, from the tailpipe). This composite source is referred to as the "96 dBA composite source" and results in ORV noise emission levels lower than the existing average.

FIGURE 26: EXAMPLES OF OFF-ROAD VEHICLES INCORPORATED IN THE COMPOSITE SOURCE

Table 17 summarizes the maximum sound level (L_{max}) for the three composite sources at a distance of 6 meters, which is close to the distance from the trail at the entrance to Rosita Flats to where the measurements were taken.

TABLE 17: L_{MAX} FOR COMPOSITE SOURCES AT 6 METERS

	L_{max} (dBA)
Average Composite Source	80.1
Composite Source +1σ	88.3
96 dBA Composite Source	75.2

Noise Model

For this plan/EIS, the NPS used the Noise Model Simulation (NMSim) model for analysis of ORVs. Information on the predominant ORV trails within the Rosita Flats and Blue Creek ORV use areas was entered into NMSim as appropriate for each alternative.

The metric chosen for modeling was the A-weighted L_{max}. While consideration of other indicators could be desirable, there is insufficient information on the number of ORVs using each area and the precise location of the vehicles at specific times to model time-dependent metrics such as L_{eq} or percent time audible. The modeling of L_{max} provides a reasonable basis for comparing the sound level contours resulting from the various alternatives that involve restrictions on operating areas and vehicle sound

emissions limits. The modeling computes the L_{max} noise levels that would result from the composite source vehicle operating on all trails and in areas where ORV use is not restricted to trails.

Study Area

Separate study areas were used for the Blue Creek and Rosita Flats ORV use areas. The study areas and soundscapes modeling extend beyond the boundaries of the national recreation area.

Analysis Scenarios

Table 18 provides a summary of the alternatives/analysis scenarios modeled for soundscapes impacts.

TABLE 18: SOUNDSCAPES MODELING SCENARIOS

	Alternative A		Alternative B		Alternative C		Alternative D	
Composite Sources	Blue Creek	Rosita Flats	Blue Creek	Rosita Flats	Blue Creek	Rosita Flats	Blue Creek	Rosita Flats
Average Composite Source	✓	✓						
Composite Source +1σ	✓	✓						
96 dBA Composite Source			✓	✓	✓	✓	✓	✓

Intensity Definitions

This section explains the context for setting the definitions and explains the scientific rationale for the definitions that were selected.

Context—It is important to base intensity definitions on the park-specific context, including consideration of the park purpose, legislative requirements, and visitor expectations. As stated in the national recreation area's enabling legislation, Congress established Lake Meredith National Recreation Area in 1990 "to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters" (16 USC 460eee) (PL 101-628). ORV use has taken place at Rosita Flats and Blue Creek since at least the 1950s and today this area is still popular with ORV enthusiasts. Because ORV use at the national recreation area is an integral component of the experience for some visitors, ORV use at Blue Creek and Rosita is permitted under a special regulation (36 CFR 7.57).

Based on this context of the importance of ORV use to the experience and purpose of the national recreation area, the soundscapes intensity definitions for Blue Creek and Rosita Flats ORV use areas need to allow higher noise levels than would be acceptable in other areas of Lake Meredith National Recreation Area or at other national parks where ORV use is not as important. It would not be reasonable to set definitions for these areas so low that no ORV use would be permitted in the Blue Creek and Rosita Flats areas given that they have been set aside specifically to allow for ORV recreation experiences.

Geographic Considerations—Both the Blue Creek and Rosita Flats ORV use areas are located in relatively narrow bands of NPS land, surrounded by undeveloped private land. Therefore, the potential exists for natural soundscapes on private land to be impacted by ORV activity within the boundaries of Lake Meredith National Recreation Area (and vice versa). Although the NPS has no management

authority over land beyond the boundaries of Lake Meredith National Recreation Area, the potential for soundscapes impacts of the alternatives extending beyond the park boundaries needs to be considered for NEPA purposes. A soundscapes study area extending 1/2 mile from the park boundary line was established for the Blue Creek and Rosita Flats areas (see figures 27 and 28). Although ORV sounds could be audible at greater distances, potential impacts in terms of increases in L_{max} would be greatest within and near the ORV use areas. The modeled L_{max} levels are generally under 30 dBA at the boundaries of the study areas, which is close to current ambient levels, further supporting the reasonableness of the 1/2-mile criterion.

The definitions are based on two criteria: (1) the level at which noise interferes with speech at a distance of 1 meter and (2) the reduction in listening area caused by ORV noise emissions. The rationale for the definitions is discussed below.

Negligible:	65 dBA or greater in 0 percent to 10 percent of the study area	and	50 percent reduction in listening area in 0 percent to 29 percent of the study area
Minor:	65 dBA of greater in 11 percent to 30 percent of the study area	and	50 percent reduction in listening area in 30 percent to 59 percent of the study area
Moderate:	65 dBA or greater in 31 percent to 60 percent of the study area	and	50 percent reduction in listening area in 60 percent to 89 percent of the study area
Major:	65 dBA or greater in 61 percent to 100 percent of the study area	and	50 percent reduction in listening area in 90 percent to 100 percent of the study area

The 65 dBA L_{max} level was selected based on studies of speech interference (EPA 1974). The potential for speech interference from a noise depends on the distance between the speaker and listener and the acceptable level of intelligibility. Figure 29 illustrates definitions for speech interference for various distances and intelligibility levels. Speech in a normal voice is 95 percent intelligible at 65 dBA at a distance of 1 meter. Intensity definitions are based in part on the percentage of the study area in which ORV noise would exceed these conditions. At the negligible level of impact, speech interference would occur in only a small portion of the study area (10 percent or less), while over 60 percent of the area would experience speech interference at the major level of impact. The minor and moderate levels are at intermediate points between these percentages.

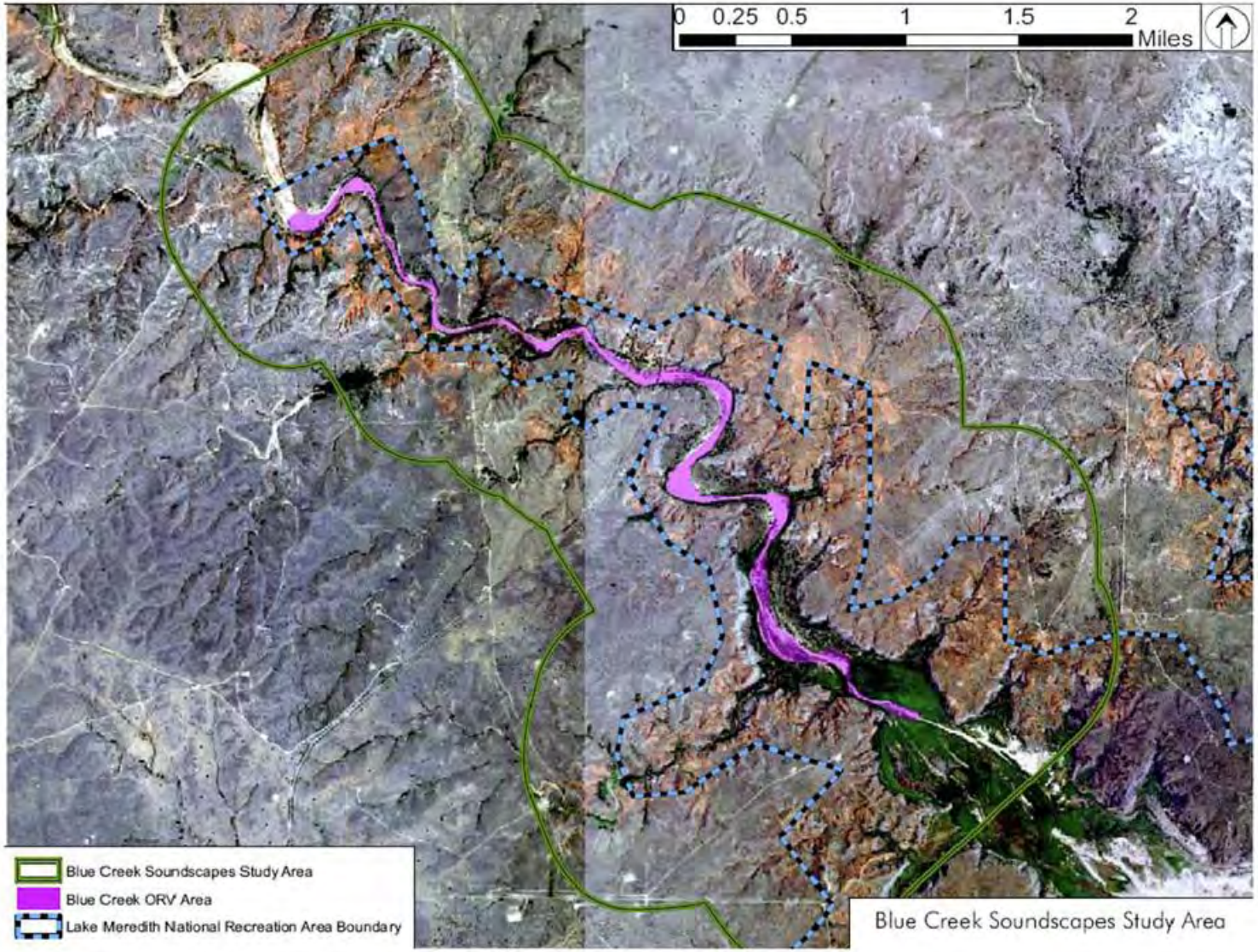


FIGURE 27: BLUE CREEK SOUNDSCAPES STUDY AREA

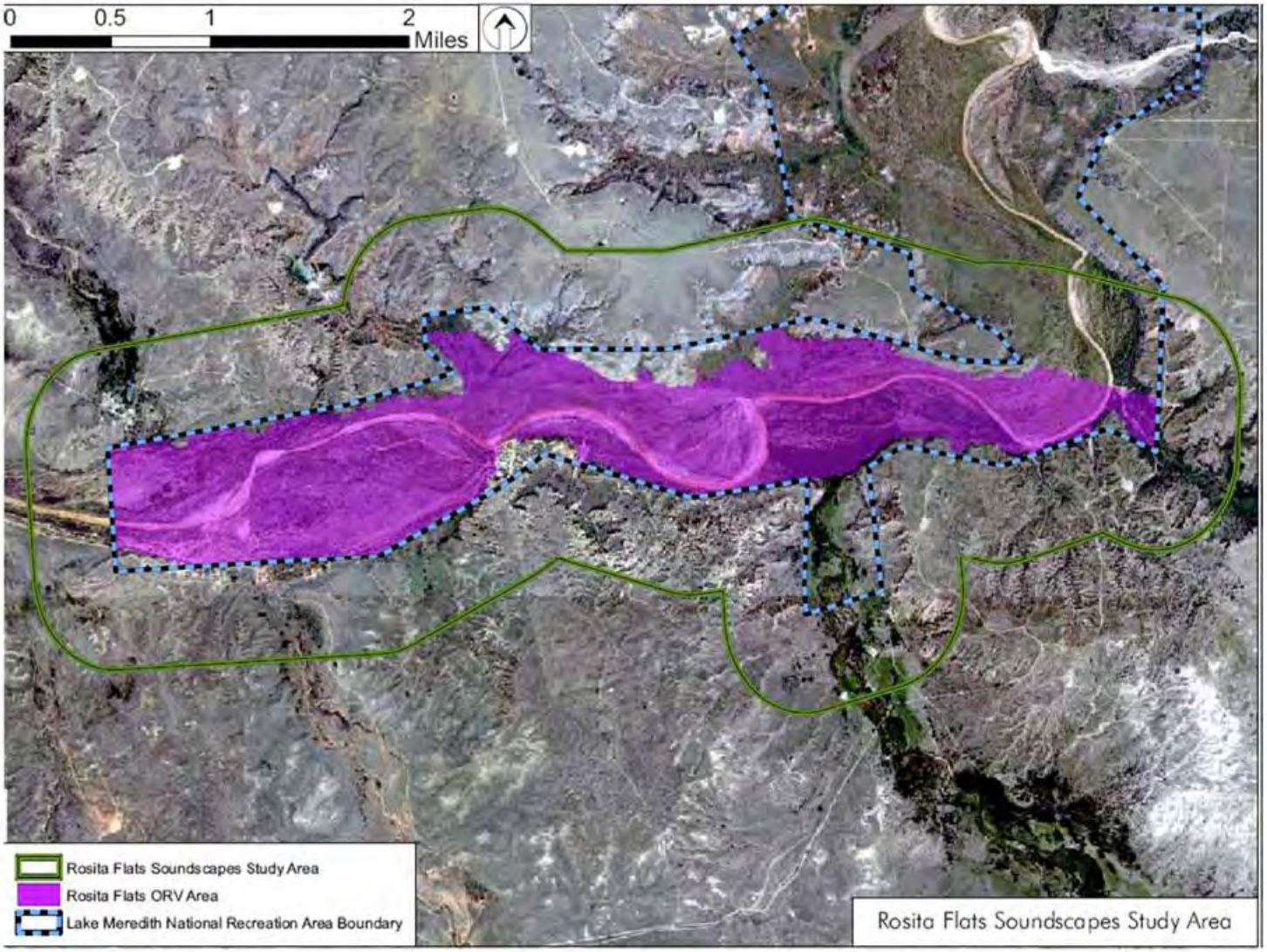
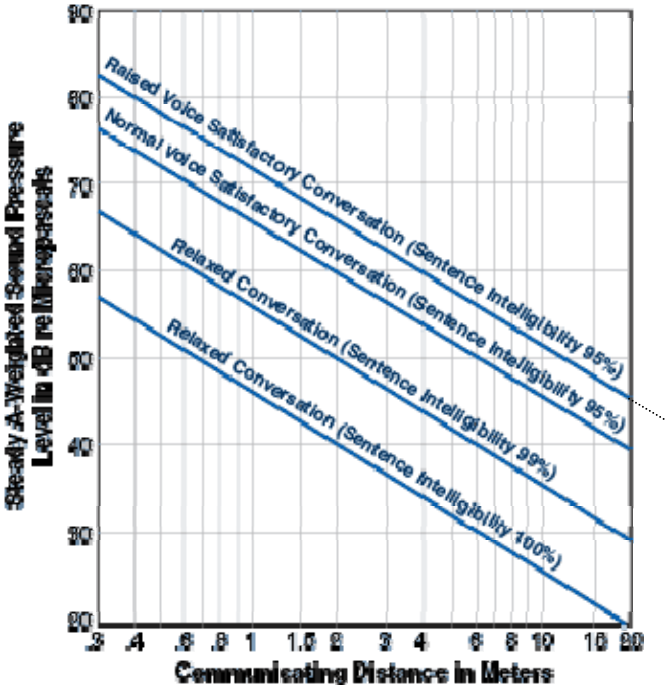


FIGURE 28: ROSITA FLATS SOUNDSCAPES STUDY AREA



Source: EPA 1974.

FIGURE 29: SPEECH INTERFERENCE

The reduction in listening area definition was selected to be protective of wildlife and the ability of humans to hear desirable natural sounds. Reduction in listening area quantifies the loss of hearing ability to humans and animals as a result of an increase in ambient noise level. Under natural ambient conditions a sound is audible within a certain area around a visitor or animal. If the ambient sound level is increased due to a noise event, the area in which the sound is audible decreases. Table 19 and figure 30 illustrate the relationship between increased ambient sound level and listening area reduction.

TABLE 19: REDUCTION IN LISTENING AREA DUE TO INCREASES IN AMBIENT SOUND LEVELS

Ambient Sound Level Increase (dBA)	3	6	10	20
Percent Reduction in Listening Area	50%	75%	90%	99%
Percent Reduction in Alerting Distance	30%	50%	70%	90%

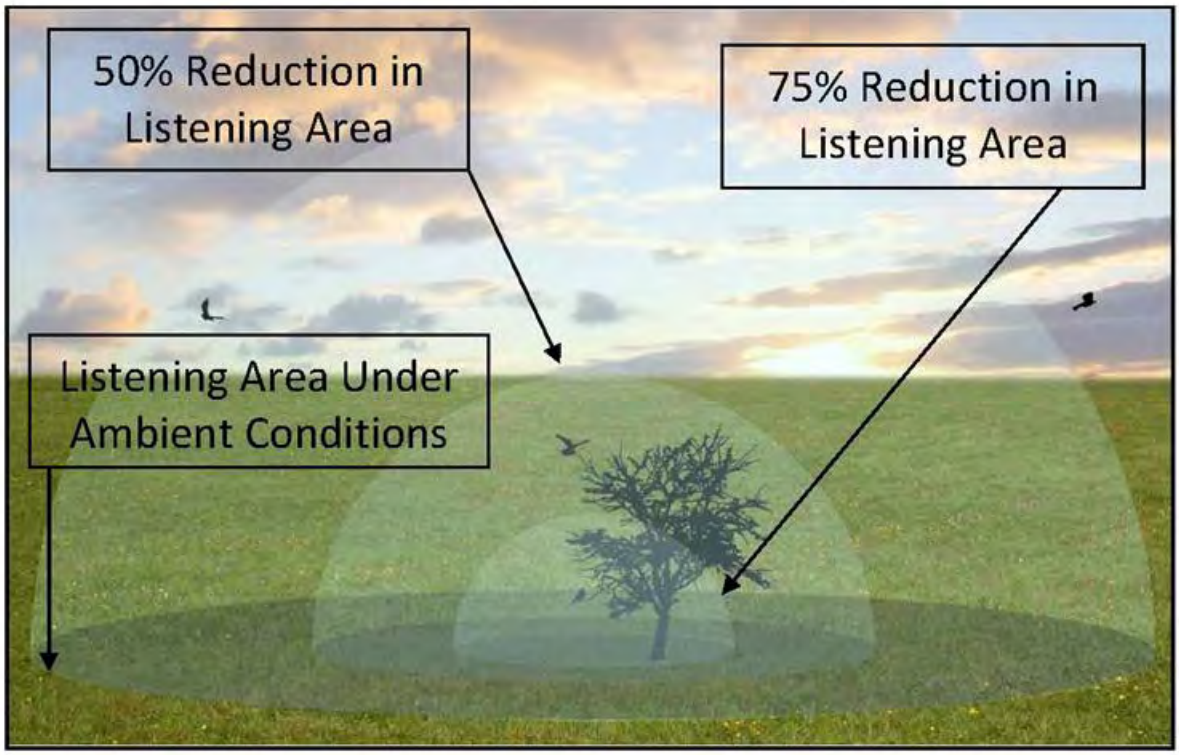


FIGURE 30: REDUCTION IN LISTENING AREA

For example, under natural ambient conditions, an owl perched in a tree may be able to hear a mouse scurrying through the brush anywhere within an area of 100 square meters (1,076 square feet) of the perch. If a noise event increases the ambient level by 3 dBA, the area in which the owl can hear a mouse would decrease by 50 percent to approximately 50 square meters (538 square feet).

Reduction in alerting distance is closely related to reduction in listening area. The residual alerting distance is equal to the square root of the residual listening area. Instead of addressing losses in terms of an area, reduction in alerting distance expresses the reduction as a linear distance from a source. For example, under natural ambient conditions, a hiker may be alerted to the sound of a flash flood at a distance of 1 mile. If a noise such as an ORV increases the ambient level by 6 dBA, the distance at which the flood could be detected would decrease by 50 percent to approximately 1/2 mile (2,640 feet).

Visitors and wildlife are impacted by their failure to hear natural sounds that would have been audible in the absence of noise: a bird misses the sound of a worm, a mouse misses the footfall of a coyote, a visitor misses the sound of a distant waterfall. Reductions in listening area and alerting distance capture these types of impacts.

For this project, reduction in listening area was determined using the natural ambient sound level from monitoring data combined with an approximation of the ambient sound level under the various alternatives. A 50 percent reduction in listening area (e.g., a 3 dBA increase in ambient sound levels) in 90 percent or more of the study area was defined as a major impact. A 50 percent reduction in listening area in 29 percent or less of the study area was defined as a negligible impact. The minor and moderate levels are at intermediate points between these percentages. The natural ambient noise level for the Blue Creek area is 28 dBA, therefore noise levels above 31 dBA will cause a 50 percent or greater reduction in

listening area. The natural ambient noise level for the Rosita Flats area is 31 dBA, therefore noise levels above 34 dBA will cause a 50 percent or greater reduction in listening area.

SUMMARY OF IMPACTS

The acoustic modeling report (NPS 2011c) summarizes the modeling results for the Blue Creek and Rosita Flats study area. Tables 20 through 23 show the number of hectares at or above the speech interference and listening area reduction criteria.

TABLE 20: BLUE CREEK STUDY AREA SOUNDSCAPES MODELING RESULTS

Blue Creek	Area with > 50% in Listening Area (> 31 dBA) (Hectares)	% of Study Area	Area Subject to Speech Interference (> 65 dBA) (Hectares)	% of Study Area
Alternative A Average Composite Source	885	38.1%	129	5.6%
Alternative A Composite Source + 1σ	1,343	57.8%	197	8.5%
Alternatives B and C 96 dBA Composite Source	700	30.1%	107	4.6%
Alternative D 96 dBA Composite Source	699	30.1%	110	4.7%

TABLE 21: ROSITA FLATS STUDY AREA SOUNDSCAPES MODELING RESULTS

Rosita Flats	Area with > 50% in Listening Area (> 34 dBA) (Hectares)	% of Study Area	Area Subject to Speech Interference (> 65 dBA) (Hectares)	% of Study Area
Alternative A Average Composite Source	1,872	67.4%	903	32.5%
Alternative A Composite Source + 1σ	2,353	84.8%	1,004	36.2%
Alternative B 96 dBA Composite Source	1,231	44.4%	218	7.9%
Alternative C 96 dBA Composite Source	1,231	44.4%	214	7.7%
Alternative D 96 dBA Composite Source	1,271	45.8%	246	8.8%

TABLE 22: SUMMARY OF SOUNDSCAPES IMPACTS FOR BLUE CREEK

Blue Creek	Area with > 50% in Listening Area (> 31 dBA) (Hectares)	% of Study Area	Listening Area Impact	Area Subject to Speech Interference (> 65 dBA) (Hectares)	% of Study Area	Speech Interference Impact	Overall Impact
Alternative A Average Composite Source	885	38.1%	Minor	129	5.6%	Negligible	Minor
Alternative A Composite Source + 1σ	1,343	57.8%	Minor	197	8.5%	Negligible	Minor
Alternatives B and C 96 dBA Composite Source	700	30.1%	Minor	107	4.6%	Negligible	Minor
Alternative D 96 dBA Composite Source	699	30.1%	Minor	110	4.7%	Negligible	Minor

TABLE 23: SUMMARY OF SOUNDSCAPES IMPACTS FOR ROSITA FLATS

Rosita Flats	Area with > 50% in Listening Area (> 31 dBA) (Hectares)	% of Study Area	Listening Area Impact	Area Subject to Speech Interference (> 65 dBA) (Hectares)	% of Study Area	Speech Interference Impact	Overall Impact
Alternative A Average Composite Source	1,872	67.4%	Moderate	903	32.5%	Moderate	Moderate
Alternative A Composite Source + 1σ	2,353	84.8%	Moderate	1,004	36.2%	Moderate	Moderate
Alternative B 96 dBA Composite Source	1,231	44.4%	Minor	218	7.9%	Negligible	Minor
Alternative C 96 dBA Composite Source	1,231	44.4%	Minor	214	7.7%	Negligible	Minor
Alternative D 96 dBA Composite Source	1,271	45.8%	Minor	246	8.8%	Negligible	Minor

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Blue Creek ORV Use Area

Under alternative A, ORV use at Blue Creek would result in 5.6 percent of the study area with a L_{max} at or above 65 dBA, assuming the average composite source. The average composite source would result in long-term negligible adverse impacts on soundscapes. The average composite source is the most representative of the ORVs using the national recreation area. The composite source +1σ results in 8.5 percent of the Blue Creek area at or above 65 dBA or a long-term minor adverse impact on soundscapes, illustrating the effect of the loudest vehicles at the national recreation area. As shown in figures 31 and 32, the majority of the Blue Creek study area affected by L_{max} levels at or above 65 dBA is located within the boundaries of Lake Meredith National Recreation Area and close to the narrow area where ORV use would be permitted under alternative A.

Under alternative A, ORV use at Blue Creek would result in 38.1 percent of the study area with a greater than 50 percent reduction in listening area, assuming the average composite source. The average composite source would result in long-term minor adverse impacts on soundscapes. The average composite source is the most representative of the ORVs using the national recreation area. The composite source +1σ would result in 57.8 percent of the study area with a greater than 50 percent reduction in listening area and a long-term minor adverse impact on soundscapes, illustrating the effect of the loudest vehicles at the national recreation area.

For Blue Creek the overall impact on soundscapes from alternative A would be minor, long term, and adverse.

Rosita Flats ORV Use Area

Under alternative A, ORV use at Rosita Flats would result in 32.5 percent of the study area with L_{max} at or above 65 dBA, assuming the average composite source. The average composite source would result in long-term moderate adverse impacts on soundscapes. The average composite source is the most representative of the ORVs used at the national recreation area. The composite source +1σ would result in 36.2 percent of the Rosita Flats area at or above 65 dBA, or a long-term moderate adverse impact on soundscapes, illustrating the effect of the loudest vehicles at the national recreation area (figures 33 and 34). Under alternative A, ORV use at Rosita Flats would result in 67.4 percent of the study area with a greater than 50 percent reduction in listening area, assuming the average composite source. The average composite source would result in long-term moderate adverse impacts on soundscapes. The average composite source is the most representative of ORVs being used at the national recreation area. The composite source +1σ results in 84.8 percent of the study area with a greater than 50 percent reduction in listening area and a long-term moderate adverse impact on soundscapes, illustrating the effect of the loudest vehicles at the national recreation area.

For Rosita Flats the overall impact on soundscapes from alternative A would be long term, moderate, and adverse.

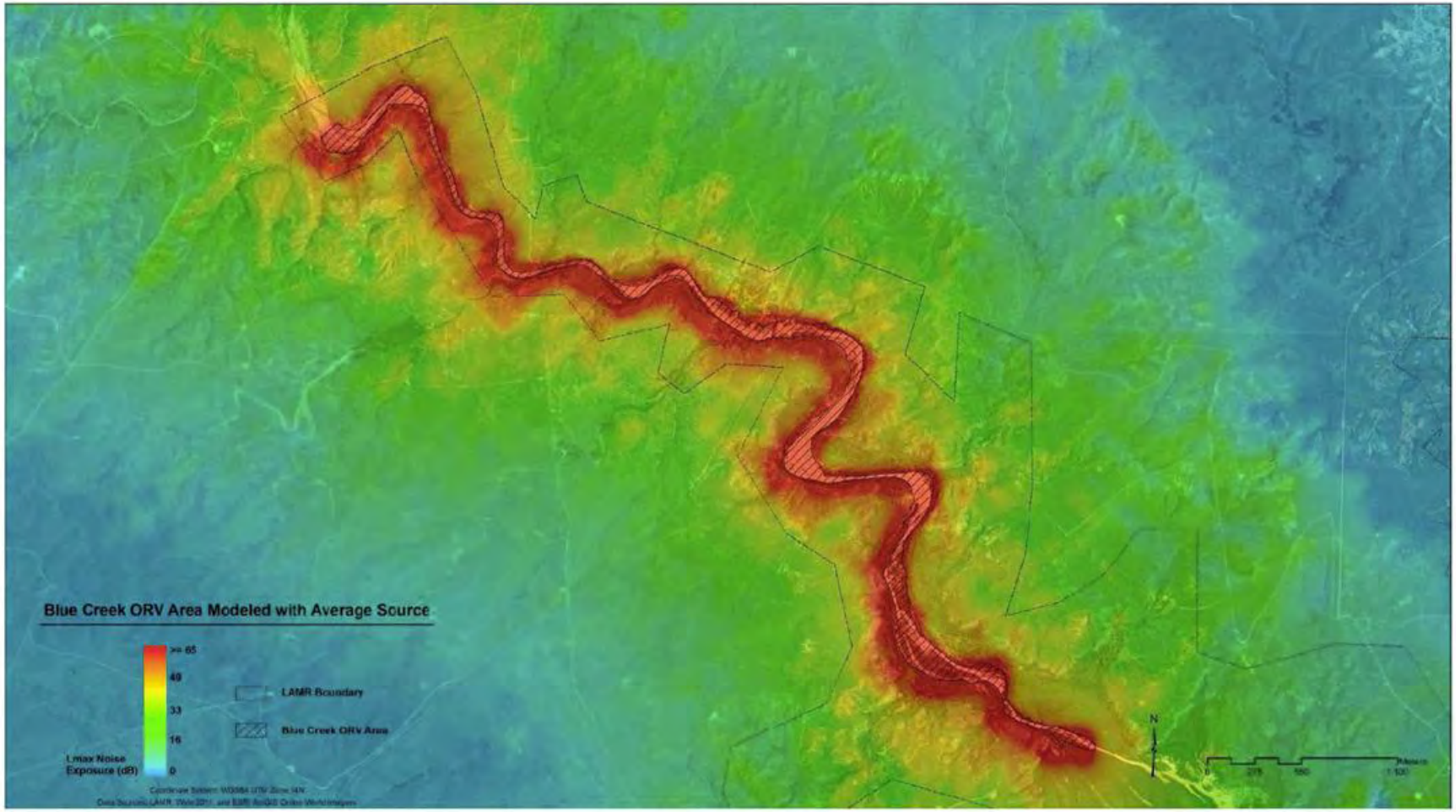


FIGURE 31: LAKE MEREDITH ALTERNATIVE A: BLUE CREEK OFF-ROAD VEHICLE USE AREA MODELED WITH AVERAGE SOURCE

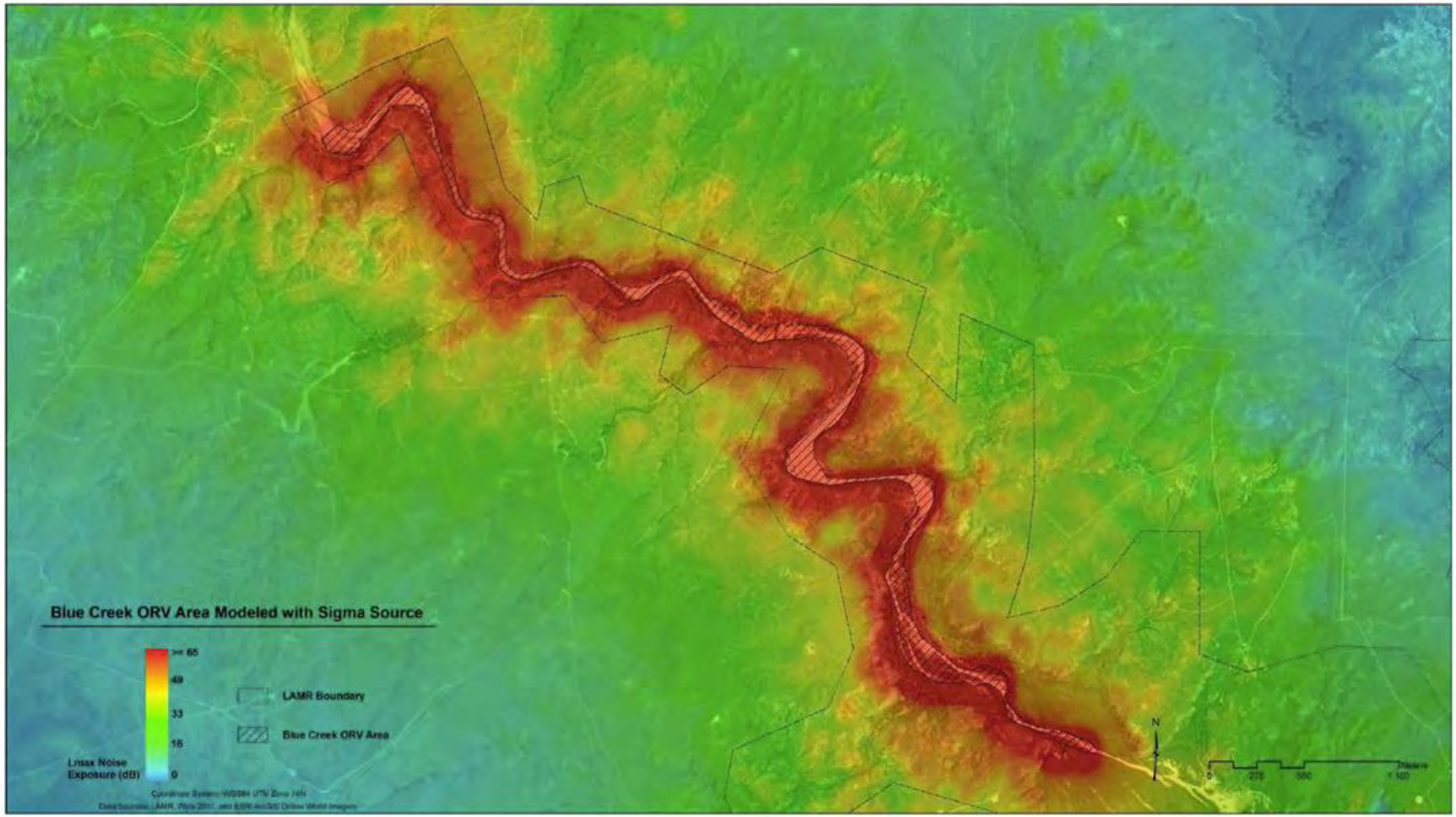


FIGURE 32: LAKE MEREDITH ALTERNATIVE A: BLUE CREEK OFF-ROAD VEHICLE USE AREA MODELED WITH SIGMA SOURCE

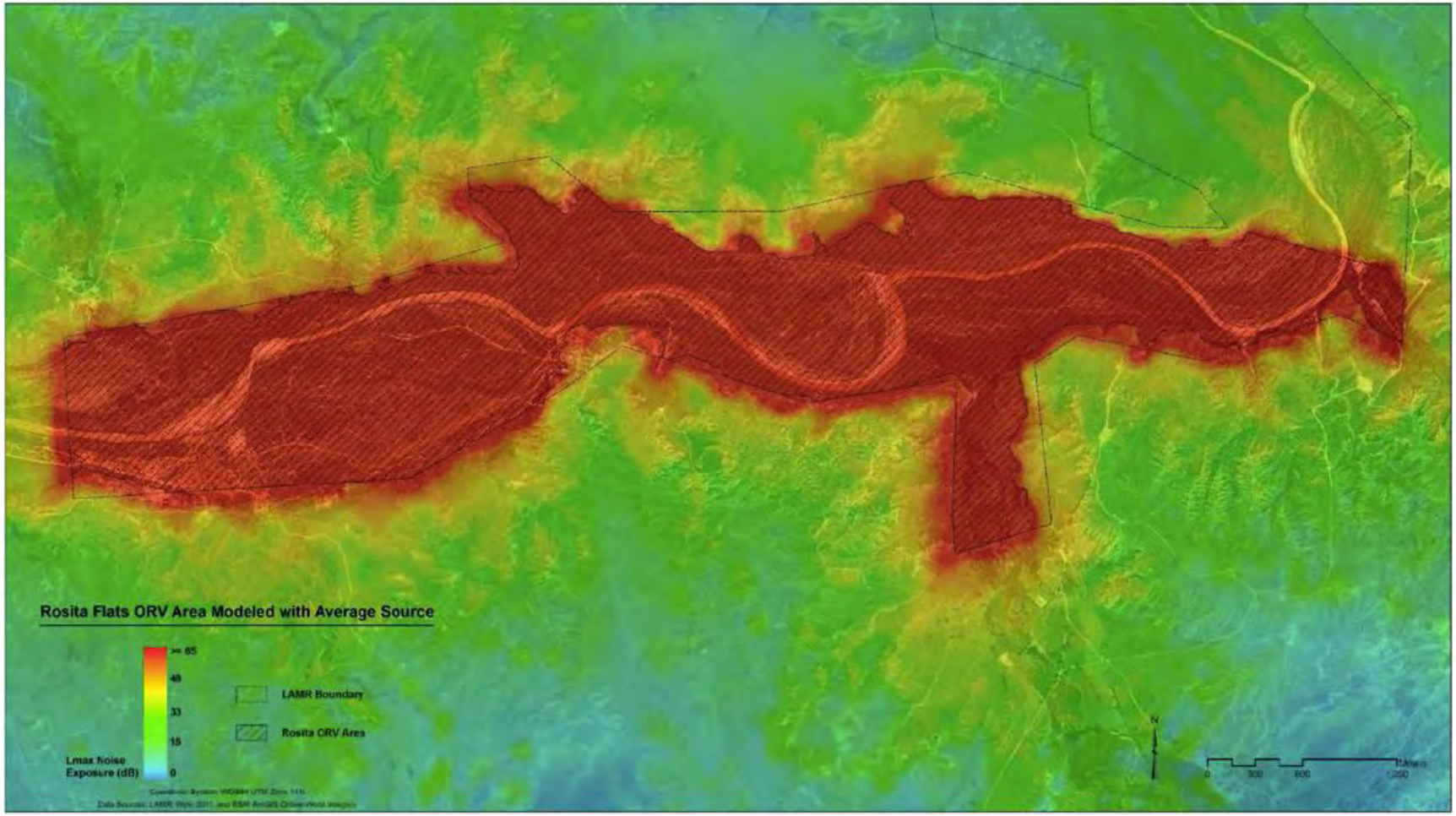


FIGURE 33: LAKE MEREDITH ALTERNATIVE A: ROSITA FLATS OFF-ROAD VEHICLE USE AREA MODELED WITH AVERAGE SOURCE

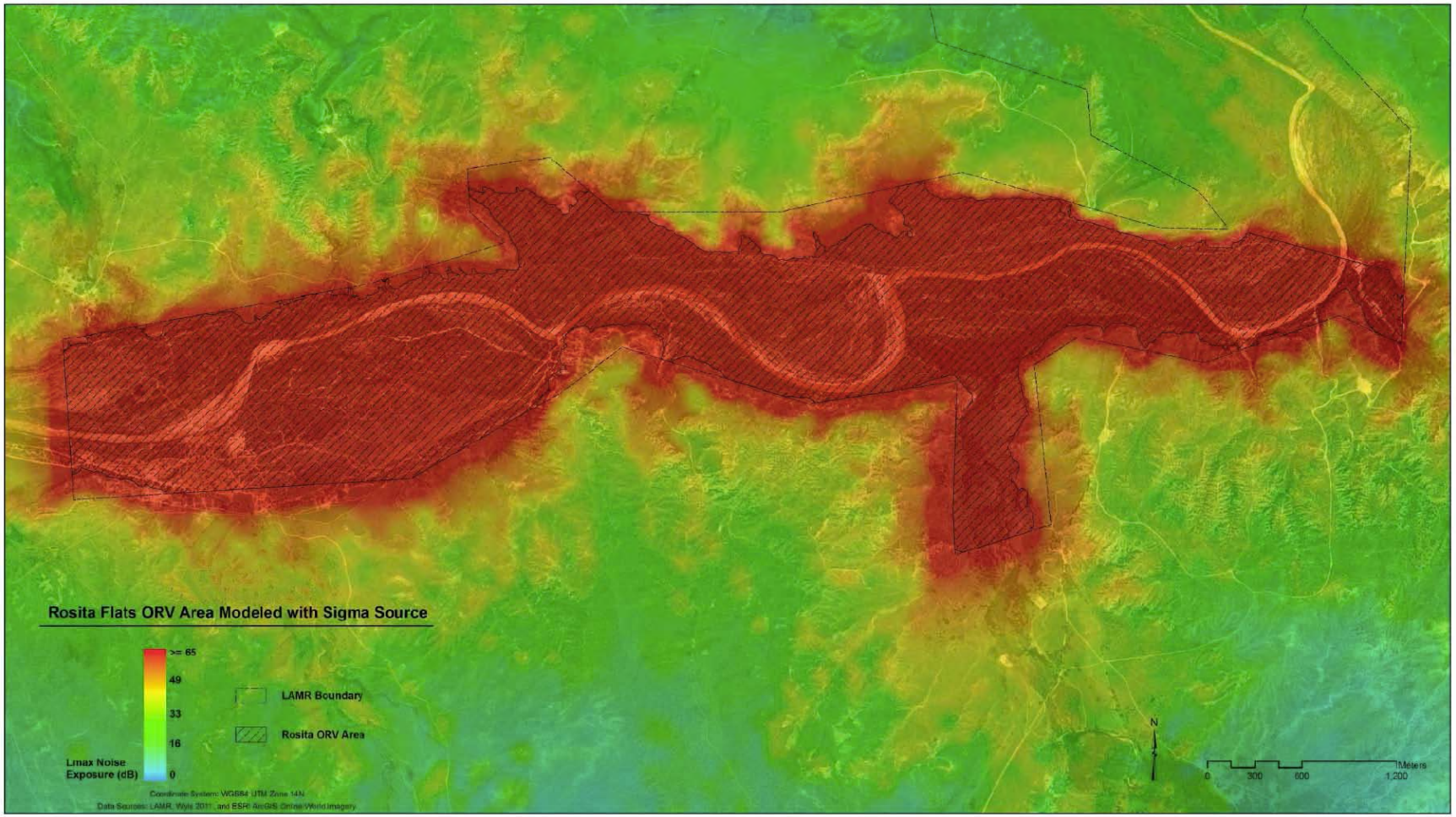


FIGURE 34: LAKE MEREDITH ALTERNATIVE A: ROSITA FLATS OFF-ROAD VEHICLE USE AREA MODELED WITH SIGMA SOURCE

Cumulative Impacts

Past, present, and reasonably foreseeable future actions both outside and within the national recreation area have the potential to impact soundscapes in the national recreation area. Actions by others potentially contributing to cumulative impacts on soundscapes in the vicinity of the Blue Creek and Rosita Flats ORV use areas include the following.

The existing soundscapes at Blue Creek and Rosita Flats are affected by FM 1913 and U.S. Highway 287, respectively. FM 1913 passes directly through the Blue Creek area near the two monitoring sites, but it was not possible to distinguish the traffic noise on FM 1913 from ORV noise in the soundscapes monitoring study summarized in chapter 3. Highway 287 is located 1.5 miles west of the entrance to Rosita Flats. Noise from Highway 287 could be distinguished from ORV noise in the monitoring at Rosita Flats. The traffic noise on Highway 287 was characterized as a distant drone that was audible almost all hours of the day. According to the Texas Department of Transportation, average annual daily traffic on Highway 287 in 2009 was 12,400. Traffic volumes on FM 1913 are substantially lower (average annual daily traffic of 220) (Texas Department of Transportation 2010). However, due to the greater proximity, individual vehicle pass-bys would be audible at a higher sound level for visitors to the Blue Creek area near FM 1913. ORV traffic will continue to influence soundscapes at Blue Creek and Rosita Flats in the future.

The soundscapes monitoring study found that non-natural sounds from oil derrick generators were audible (at low sound levels) at all monitoring locations for almost all hours of the day and night (e.g., non-natural sounds audible 100 percent or near 100 percent of the time). At the time of the 2002 Final Oil and Gas Management Plan, there were 170 active nonfederal oil and gas operations in the Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. The reasonably foreseeable development scenario associated with the Oil and Gas Management Plan EIS estimated 22.8 billion cubic feet of natural gas and 420,000 barrels of oil could be produced from Lake Meredith National Recreation Area by 2022 and that up to 85 additional wells could be drilled to extract these resources (NPS 2002a). Oil and gas development can also occur on the lands outside the national recreation area. While the specific location of future oil and gas development is not known, it is reasonable to anticipate that oil and gas development will continue to contribute non-natural sounds audible at Blue Creek and Rosita Flats.

At Blue Creek, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term minor adverse impacts of alternative A, would result in long-term minor adverse cumulative impacts on natural soundscapes. At Rosita Flats, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term moderate adverse impacts of alternative A, would result in long-term moderate adverse cumulative impacts on natural soundscapes.

Conclusion

The effects of alternative A on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative A on soundscapes at Rosita Flats would be long term, moderate, and adverse. Cumulative impacts on soundscapes would be long term, minor to moderate, and adverse.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Blue Creek ORV Use Area

Under alternative B, ORV use at Blue Creek would result in 4.6 percent of the study area with a L_{max} at or above 65 dBA. The 96 dBA composite source under alternative B would result in long-term negligible

adverse speech interference impacts. As shown in figure 35, the area of the Blue Creek study area affected by L_{max} levels at or above 65 dBA is slightly greater under alternative B compared to alternative A because of the addition of camping zones where ORV use would be permitted for access purposes. Under alternative B, ORV use at Blue Creek would result in 30.1 percent of the study area with a greater than 50 percent reduction in listening area. This would result in long-term minor adverse listening area impacts.

For Blue Creek the overall soundscapes impact from alternative B would be minor, long term, and adverse.

Rosita Flats ORV Use Area

Under alternative B, ORV use at Rosita Flats would result in 7.9 percent of the study area with a L_{max} at or above 65 dBA. The 96 dBA composite source under alternative B would result in long-term negligible adverse speech interference impacts. Comparing figure 33 (alternative A) and figure 36 (alternative B) shows the substantial reduction in the area with L_{max} levels at or above 65 dBA as a result of the designation of specific ORV zones and routes within Rosita Flats, including the resource protection zone, and the tailpipe noise emissions limit under alternative B. Under alternative B, ORV use at Rosita Flats would result in 44.4 percent of the study area with a greater than 50 percent reduction in listening area. This would result in long-term minor adverse listening area impacts.

For Rosita Flats, the overall soundscapes impact from alternative B would be minor, long term, and adverse.

Cumulative Impacts

The impacts on soundscapes from other past, present, and reasonably foreseeable future actions would be the same as described for alternative A. At Blue Creek, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term minor adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on natural soundscapes. At Rosita Flats, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term minor adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on natural soundscapes.

Conclusion

The effects of alternative B on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative B on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.

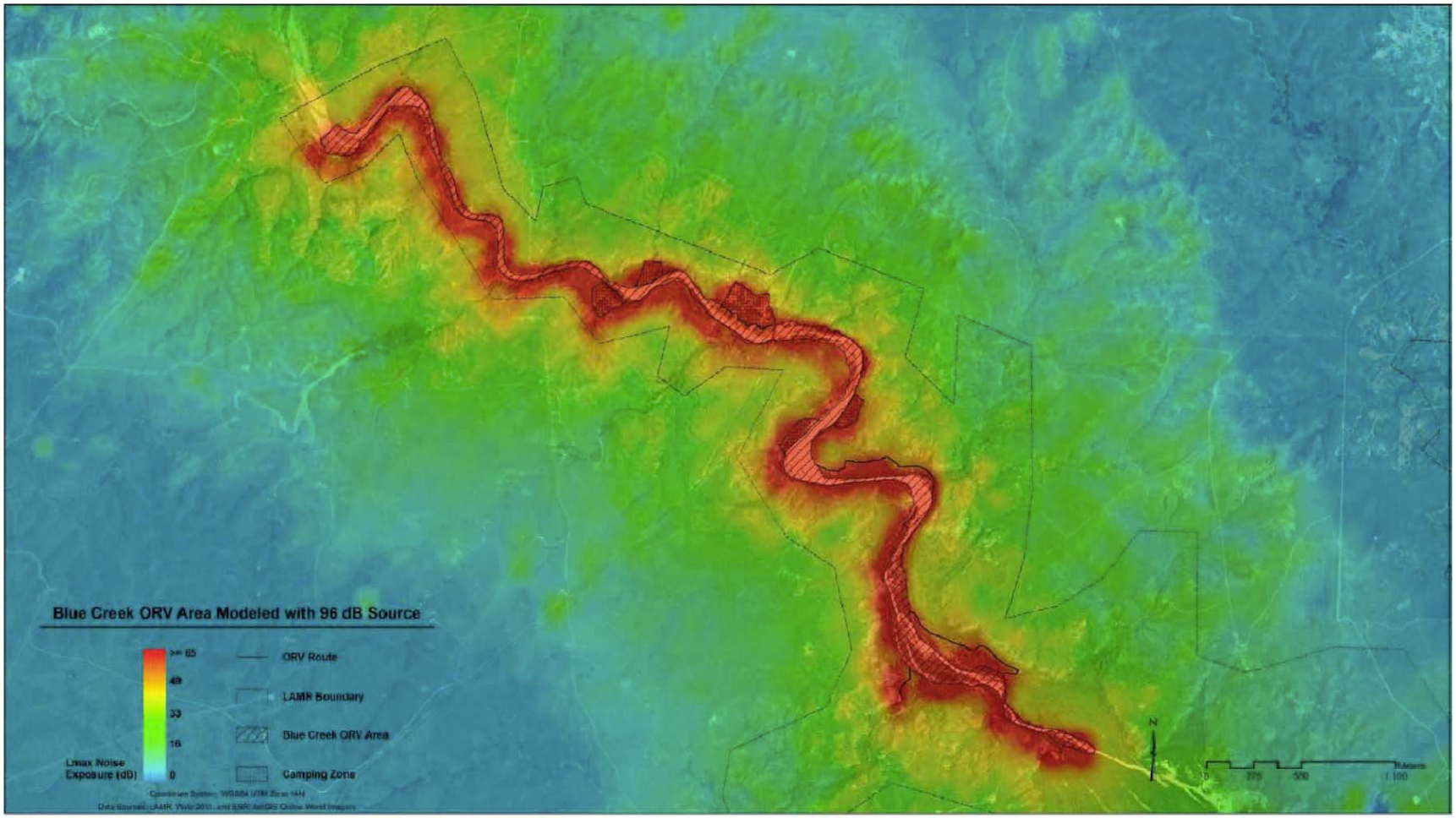


FIGURE 35: LAKE MEREDITH ALTERNATIVE B AND C: BLUE CREEK OFF-ROAD VEHICLE USE AREA MODELED WITH 96 DB SOURCE

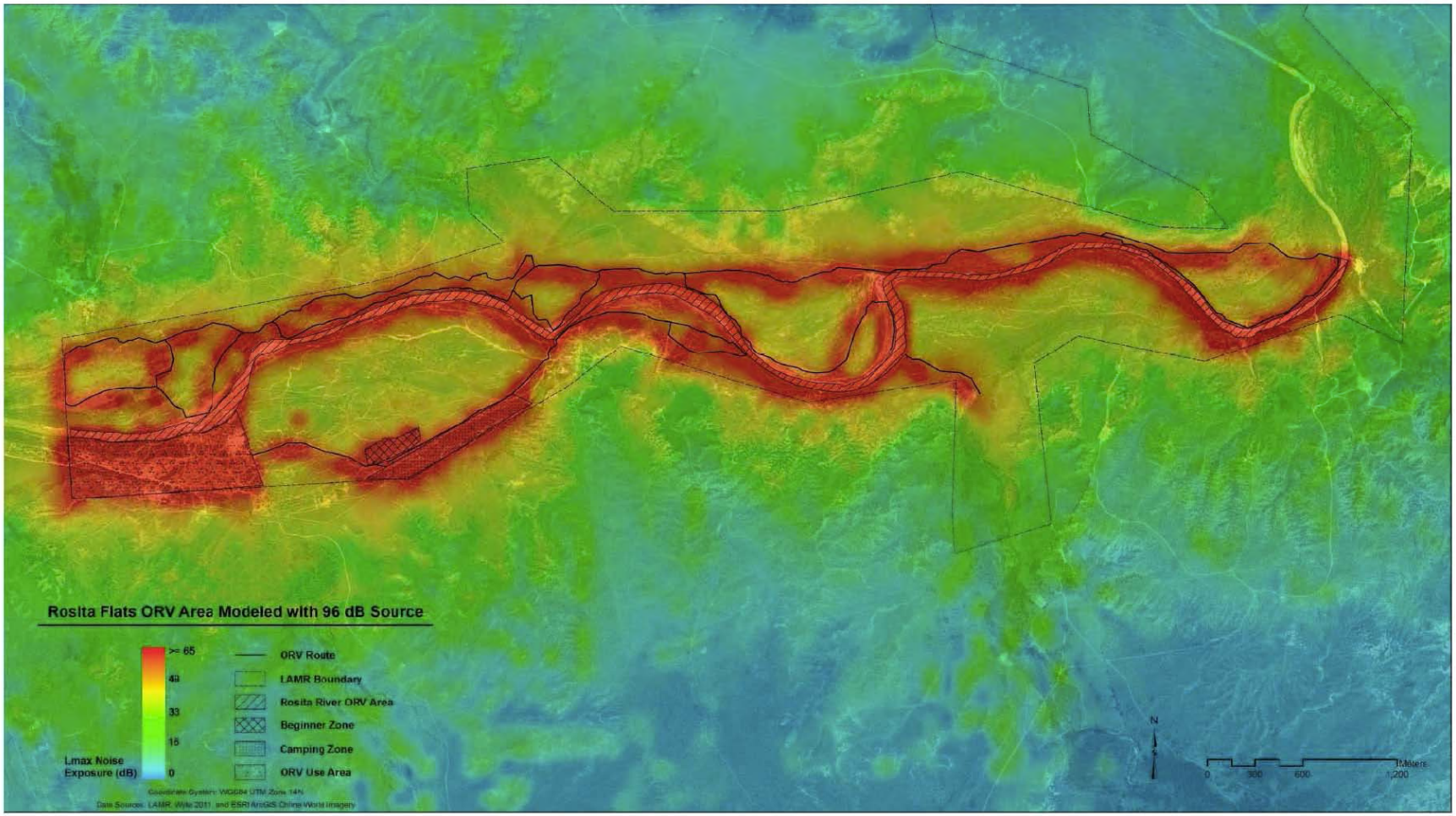


FIGURE 36: LAKE MEREDITH ALTERNATIVE B: ROSITA FLATS OFF-ROAD VEHICLE USE AREA MODELED WITH 96 DB SOURCE

IMPACTS OF ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Blue Creek ORV Use Area

In terms of soundscapes impacts at Blue Creek, alternative C would be identical to alternative B. Figure 35 represents the L_{max} contour levels for alternatives B and C. Under alternative C, ORV use at Blue Creek would result in 4.6 percent of the study area with a L_{max} at or above 65 dBA. The 96 dBA composite source under alternative C would result in long-term negligible adverse speech interference impacts. As shown in figure 35, the area of the Blue Creek study area affected by L_{max} levels at or above 65 dBA is slightly greater under alternative C compared to alternative B because of the addition of camping zones where ORV use would be permitted for access purposes. Under alternative C, ORV use at Blue Creek would result in 30.1 percent of the study area with a greater than 50 percent reduction in listening area. This would result in long-term minor adverse listening area impacts.

For Blue Creek the overall soundscapes impact from alternative C would be long term, minor, and adverse.

Rosita Flats ORV Use Area

Under alternative C, ORV use at Rosita Flats would result in 7.7 percent of the study area with a L_{max} at or above 65 dBA. The 96 dBA composite source under alternative C would result in long-term negligible adverse speech interference impacts. Comparing figure 33 (alternative A) and figure 37 (alternative C) shows the substantial reduction in the area with L_{max} levels at or above 65 dBA as a result of the designation of specific ORV zones and routes within Rosita Flats and the tailpipe noise emissions limit under alternative C. One difference in soundscapes impacts at Rosita Flats is that alternative C would not include the beginner's area that is part of alternative B.[2] Under alternative C, ORV use at Rosita Flats would result in 44.4 percent of the study area with a greater than 50 percent reduction in listening area. This would result in long-term minor adverse listening area impacts.

For Rosita Flats, the overall soundscapes impact from alternative C would be minor, long term, and adverse.

Cumulative Impacts

Impacts on soundscapes from other past, present, and reasonably foreseeable future actions would be the same as described for alternative A. At Blue Creek, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term minor adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on natural soundscapes. At Rosita Flats, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term minor adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on natural soundscapes.

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[2] Alternative B includes a resource protection zone in the eastern portion of Rosita Flats where only ATVs, UTVs, and motorcycles would be allowed. The resource protection zone is not part of alternative C. However, the soundscapes modeling framework assumes that a composite source meeting the 96 dBA limit is operating everywhere any ORVs are permitted and does not distinguish between vehicle types. Therefore, the resource protection zone does not affect the L_{max} modeling results.

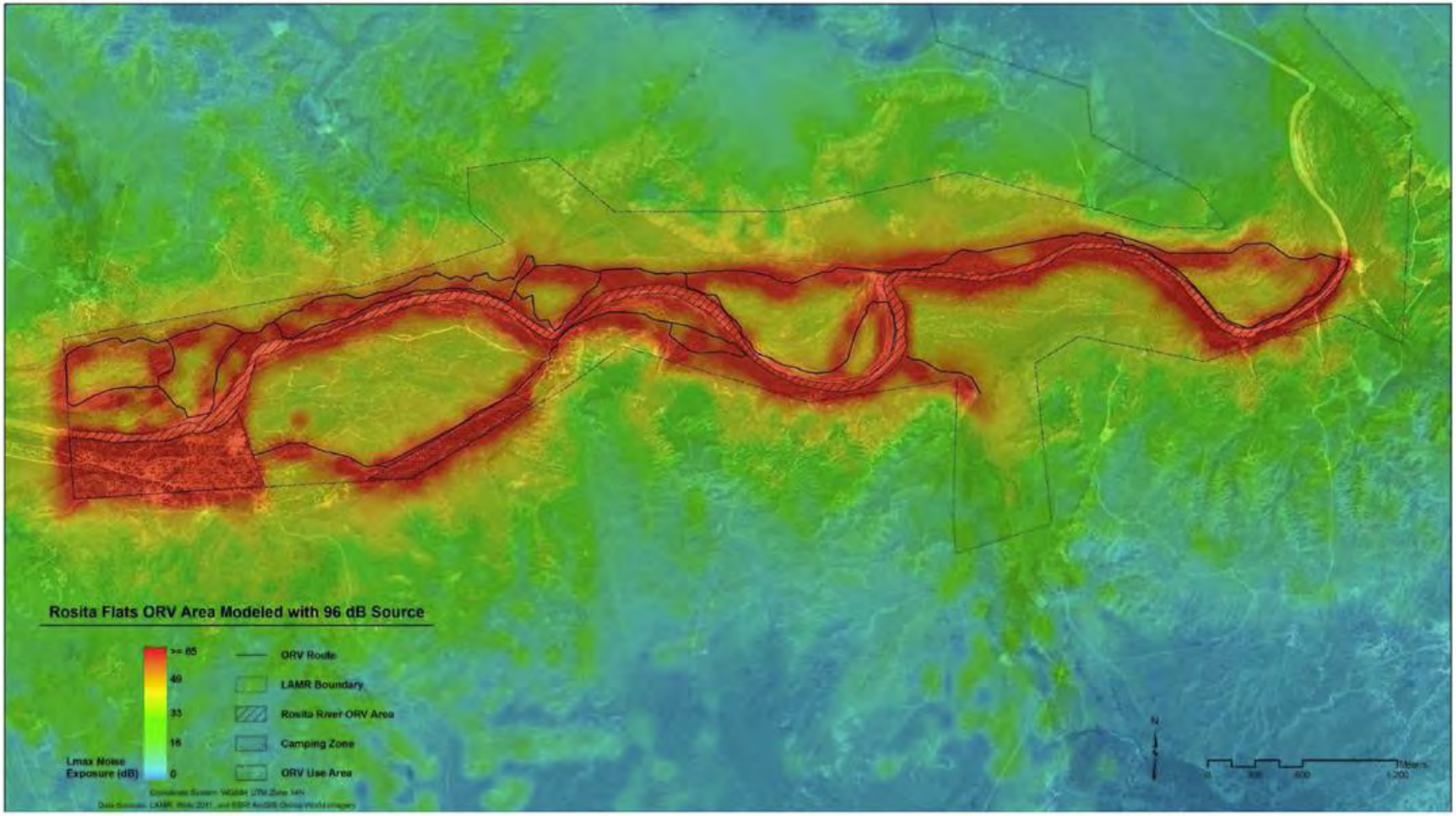

FIGURE 37: LAKE MEREDITH ALTERNATIVE C: ROSITA FLATS OFF-ROAD VEHICLE USE AREA MODELED WITH 96 DBA SOURCE

Conclusion

The effects of alternative C on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative C on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.

IMPACTS OF ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

For Blue Creek, alternative D is similar to alternative B in that ORVs would be allowed to operate throughout the cutbank-to-cutbank area with the same muffler requirements. The two differences for the noise model consist of more camping zones around the FM 1913 road bridge area and the omission of the southernmost ORV route with the establishment of a resource protection zone. At Rosita Flats, the two changes from alternative B consist of the establishment of a new ORV use area near Bull Taco Hill and a new camping zone near the entrance. These options did not result in changes to the noise modeling output, and the soundscapes impacts of alternative D would be identical to those of alternative B at both Blue Creek and Rosita Flats.

Blue Creek ORV Use Area

Under alternative D, ORV use at Blue Creek would result in 4.7 percent of the study area with a L_{max} at or above 65 dBA. The 96 dBA composite source under alternative D would result in long-term negligible adverse speech interference impacts. As shown in figure 35, the area of the Blue Creek study area affected by L_{max} levels at or above 65 dBA is slightly greater under alternative D compared to alternative B because of the addition of camping zones where ORV use would be permitted for access purposes. Under alternative D, ORV use at Blue Creek would result in 30.1 percent of the study area with a greater than 50 percent reduction in listening area. This would result in long-term minor adverse listening area impacts.

For Blue Creek the overall soundscapes impact from alternative D would be long term, minor, and adverse.

Rosita Flats ORV Use Area

Under alternative D, ORV use at Rosita Flats would result in 8.8 percent of the study area with a L_{max} at or above 65 dBA. The 96 dBA composite source under alternative D would result in long-term negligible adverse speech interference impacts. Compared with alternative A, under alternative D there would be a substantial reduction in the area with L_{max} levels at or above 65 dBA as a result of the designation of specific ORV zones and routes within Rosita Flats, including the resource protection zone, and the tailpipe noise emissions limit under alternative D. Under alternative D, ORV use at Rosita Flats would result in 45.8 percent of the study area with a greater than 50 percent reduction in listening area. This would result in long-term minor adverse listening area impacts.

For Rosita Flats, the overall soundscapes impact from alternative D would be long term, minor, and adverse.

Cumulative Impacts

The impacts on soundscapes from other past, present, and reasonably foreseeable future actions would be the same as described for alternative A. At Blue Creek, the impacts of past, present, and reasonably

foreseeable future actions, combined with the long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on natural soundscapes. At Rosita Flats, the impacts of past, present, and reasonably foreseeable future actions, combined with the long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on natural soundscapes.

Conclusion

The effects of alternative D on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative D on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.

WILDLIFE AND WILDLIFE HABITAT

NPS *Management Policies 2006* states that the NPS "will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems. The term 'plants and animals' refers to all five of the commonly recognized kingdoms of living things and includes such groups as flowering plants, ferns, mosses, lichens, algae, fungi, bacteria, mammals, birds, reptiles, amphibians, fishes, insects, worms, crustaceans, and microscopic plants and animals" (NPS 2006b, Section 4.4.1). The NPS will achieve this by:

- Preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;
- Restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
- Minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them. (NPS 2006b)

NPS *Management Policies 2006* further states, "Superintendents will develop and implement visitor use management plans and take action, as appropriate, to ensure that recreational uses and activities in the park are consistent with its authorizing legislation or proclamation and do not cause unacceptable impacts on park resources or values" (NPS 2006b, Section 8.2.2.1).

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

Lake Meredith National Recreation Area provides habitat for a variety of fish, mammals, birds, amphibians, and reptiles, which could be affected by actions described in the proposed alternatives. This includes species disturbance and displacement as a result of vehicle noise, habitat destruction, and species injury or mortality. Much of the existing research has focused on habitat fragmentation, the effects of erosion, and vegetation trampling by visitors. In addition to habitat fragmentation and disruption, an issue of concern is direct species mortality from vehicle collisions.

Impacts on wildlife and wildlife habitat were assessed by determining the current species status and condition of habitat in the national recreation area and evaluating the extent to which ORV access would cause potential impacts. This included an assessment of the potential beneficial effects of closing certain routes/areas to ORVs.

Following are the intensity definitions for impacts on wildlife and wildlife habitat.

Negligible: Wildlife and/or their habitats would not be affected or the effects would be at or below the level of detection, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population.

Minor: Effects on wildlife and/or their habitats would be detectable, although the effects would be localized and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Effects on wildlife and/or their habitats would be readily detectable, long term, and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.

Major: Effects on wildlife and/or their habitats would be obvious, would be long term, and would have substantial consequences to wildlife populations in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

Duration: Short-term—Impacts would last less than one year.

Long-term—Impacts would last more than one year.

Study Area

The study area for wildlife and wildlife habitat is defined as the Rosita Flats and Blue Creek ORV use areas for the analysis of the impacts of the alternatives and defined as Lake Meredith National Recreation Area and adjacent land for the analysis of cumulative impacts.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, the management of ORV use and access at the national recreation area would continue current management strategies based on the 2007 *Interim OHV Use Plan* (NPS 2007a), the regulations contained in 36 CFR 7.57, and the Superintendent's Compendium. ORV use would continue to be permitted throughout Rosita Flats below the 3,000-foot elevation line and at Blue Creek along the creek bottom from cutbank to cutbank. No additional management tools such as zoning, permits, or use limits would be implemented.

Although not specific to the national recreation area, documentation of relatively early use of ORVs in desert ecosystems, like those found at the national recreation area, found that ORV use was destructive, causing long-lasting damage to land and aquatic ecosystems, wildlife, soils, and hydrologic flows (New Mexico EMNRD et al. 2008). The continued use of ORVs at the national recreation area would impact fish and wildlife, including species disturbance and displacement, habitat destruction, degraded water quality, and vehicle/wildlife collisions causing injury or mortality to individuals of wildlife species. For example, amphibians and reptiles have been crushed to death or injured by ORV use on public lands (Bury and Luckenbach 2002). In general, habitat fragmentation reduces the size of patches of desert, forest, shrublands, wetlands, and grasslands. This reduces the total area of contiguous habitat available for

wildlife species, especially birds, and increases the isolation of the habitat (Campbell and Johns n.d.), resulting in changes to forage and cover, flows of energy and nutrients, and even the microclimate of the area. Other adverse effects of habitat fragmentation include genetic effects and potential for local extinctions, shifts to invasive species, and increased likelihood of uncharacteristic predation as well as increased exploitation by humans (New Mexico EMNRD et al. 2008).

Other risks range from injury during escape responses to the more-severe habitat avoidance and nest abandonment. Bowles (1995, cited in New Mexico EMNRD et al. 2008) notes that noise is an environmental stressor that can induce startle responses, aversion, and maladaptive behaviors; cause changes in habitat use, communication, predation, foraging, courtship, breeding, and reproduction; produce stress responses such as changes in heart rate and energy consumption; and cause hearing loss. Several studies indicate that wildlife generally experience an increase in heart rate and altered metabolism when introduced to human-made noise (Radle 2007). Noise from motorized vehicles can inhibit the senses of animals that depend on hearing and vibration detection to survive (Berry 1980; Bury 1980); for example, bats and certain reptile species.

Much of the existing research has focused on the effects of erosion and of trampled vegetation due to visitors, and the associated impacts on wildlife habitat values (Joslin and Youmans 1999; Monz et al. 2003). ORV-related impacts on amphibian and reptile species were identified in Montana and include indirect impacts on populations via habitat destruction, chemical contamination, sedimentation, and the creation of migration barriers. Studies of small mammals have reported adverse effects from motorized vehicle use, including population reduction, habitat modification, forage/cover removal, echolocation disturbance, and energy expenditure (Joslin and Youmans 1999).

Further research regarding the adverse effects of human recreational activities on bird species has shown nest desertion and temporary abandonment, as well as changes in foraging habits (Joslin and Youmans 1999). Bird species in the national recreation area that nest on or near the ground near the access routes would most likely be more vulnerable to the effects of motorized vehicles due to the direct exposure of nests and young to visitors and motorized vehicles. Although potential suitable nesting habitat exists near the Blue Creek and Rosita Flats ORV use areas, nesting is not known to occur at those areas (Wimer 2010a). However, it is likely that past and present use of ORVs in the national recreation area has resulted in habitat avoidance and disturbance for both nesting and non-nesting bird species. As a result, continued ORV use would likely result in long-term moderate adverse impacts on nesting and non-nesting bird habitat in the national recreation area.

Among ungulate species (hoofed mammal), such as white-tailed deer, research has shown that the effects of recreational disturbance include relatively high energy expenditures resulting from increased heart rate and altered behavioral response (Joslin and Youmans 1999).

As described in chapter 3, primary threats to several fish species found in the national recreation area include habitat fragmentation and destruction, pollution, and fluctuating water temperatures (NatureServe 2009). In the Blue Creek and Rosita Flats ORV use areas, it is common for rivers and streams to dry up, leaving some fish congregated in small to large puddles. ORVs driven through puddles can result in direct mortality of fish species and/or habitat disruption (Wimer 2010b).

Locally, along open ORV routes and use areas, habitat disturbance and fragmentation would continue to be apparent and individual mortality could occur, especially for smaller mammals and amphibian and reptile species. As indicated in studies of ORV use in other arid ecosystems, even if all ORV users stay on trails, ORVs can cause erosion and stream sedimentation, transport invasive species, raise dust clouds, and disrupt and damage wildlife as well as reducing effective habitat. In general, trails created by ORV users can cause a patchwork of habitat often correlated to reduced ecosystem productivity (New Mexico

EMNRD et al. 2008). The lack of designated ORV routes and use limits would add to the long-term adverse impacts of ORV use at the Blue Creek and Rosita Flats ORV use areas due to unlimited contact between ORVs and wildlife habitat. In addition, no speed limits would be established for either ORV use area under alternative A, which would increase the risk of vehicle/wildlife collisions due to the potential for less reaction time (for both operator and animal). As a result, ORV use in these areas would have localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat.

Although bulletin boards with campground rules and regulations and other national recreation area information exist at Blue Creek and Rosita Flats, no interpretation services would be provided at either areas under alternative A. Education would continue to occur primarily through visitor contact with rangers, park staff, and on-site educational opportunities; however, patrolling by park law enforcement occurs less frequently at Rosita Flats than at Blue Creek due to the remote location of Rosita Flats. Patrolling by ORV would have short-term negligible to minor adverse impacts due to the low numbers of law enforcement vehicles in these areas.

In summary, continued management of ORV use at the Blue Creek and Rosita Flats areas under alternative A would likely result in short- and long-term moderate adverse impacts on wildlife and wildlife habitat.

Cumulative Impacts

Other past, present, and future planning actions in and around the national recreation area have the potential to impact wildlife and wildlife habitat. Prior to the establishment of Lake Meredith as a public recreation area in 1964, the Canadian River and Blue Creek riparian areas were used by the local community for recreation. In the 1960s, ORV use consisted of a few river buggies made from old vehicles converted to operate in the river bottom. Given the length of time ORV use has been occurring at Lake Meredith, it is difficult to measure resource impacts because there is no baseline to measure against (NPS 2007a). The Rosita Flats and Blue Creek ORV use areas were officially designated by special regulation (36 FR 7.57) in the 1970s. It is likely that large-scale efforts to protect vegetation and wildlife at Rosita Flats and Blue Creek did not begin until 1990, when Lake Meredith National Recreation Area was established. Therefore, it is likely that, prior to establishment, ORV use along the Canadian River at Rosita Flats contributed to long-term moderate to major adverse impacts on wildlife and wildlife habitat from vehicles operating without restrictions in aquatic and terrestrial habitat, leading to habitat destruction and fragmentation and direct mortality of fish and wildlife.

Lake Meredith was created by the construction of the Sanford Dam on the Canadian River to allow the impoundment and diversion of water for 11 municipalities of the Texas Panhandle. Although the dam assists in protecting vegetation by preventing uprooting from large-scale floods, the damming of the Canadian River has resulted in long-term moderate adverse impacts on fish that rely on natural flooding to maintain their habitat and compete with invading nonnative aquatic species. Many native fish species, such as the Arkansas River shiner, need frequent natural flooding (which the dam has inhibited) and miles of unimpounded, flowing water to successfully complete their reproductive cycle (USFWS 2005c).

The lake water level, with a record high of 101.8 feet in 1973 (Welch 2010), has drained from 87 feet at the beginning of the decade to 64 feet five years ago (Blackburn 2010) and approximately 30 feet by early January 2012 (CRMWA 2012). As of August 2014, lake water levels were at approximately 44 feet. The decreasing water level is a result of too little rain in the area feeding the creeks and the Canadian River, which supply the lake (CRMWA n.d.). For the past 10 years, rainfall that occurred over much of the state has not occurred within Lake Meredith's watershed. Even in years where near normal rainfall totals have occurred, those rains have not been of the intensity and duration needed to generate significant runoff; it is the large storm events that make a difference in lake levels (CRMWA n.d.). Additionally, the High

Plains aquifer (which includes the Ogallala aquifer) underlies parts of eight states, including Texas, and has been intensively developed for irrigation. Since the establishment of the recreation area, water levels have declined more than 100 feet in some areas and the saturated thickness has been reduced by more than half in others (USGS 2011). The depletion of groundwater in the area contributes to the decreasing lake levels in the national recreation area and a reduction in stream habitat. Decreasing water levels pose a threat to native fish in the area. Microhabitat selection by many fish is highly influenced by water depth and current velocity (USFWS 2005a). In addition, a reduction in available habitat often leads to fish being congregated in small to large puddles of water, leaving them more vulnerable to disruption. Furthermore, as described in chapter 1, the Rosita Flats and Blue Creek ORV use areas can be the only source of drinking water for wildlife in times of drought, attracting more species than normal to the areas and increasing the risk of wildlife disturbance and mortality by ORVs.

Cottonwoods have a high water requirement and grow in old streambeds and damp, low-lying areas where they have access to water (Gober n.d.). Cottonwoods are likely to absorb existing water from puddles, ponds, and streams, leading to reduced habitat availability for fish species. Further reduction in available habitat for fish would contribute to the existing long-term minor to moderate adverse impacts from water loss.

Another contributor to water loss and degradation in the national recreation area and the region is the invasion of nonnative plant species, which compete with native plants such as cottonwood. Saltcedar, or tamarisk, is an invasive plant that exists throughout Texas and extensively infests the national recreation area. Saltcedar spreads quickly and is known to deplete streamflow and produce water quality changes that are not favorable to many species of fish (CRMWA 2005), resulting in long-term moderate adverse impacts. It is estimated that one large saltcedar can use 200 gallons of water per day or one acre can use 3 to 7 acre-feet of water per year (Texas State Soil & Water Conservation Board 2009). Saltcedar has become common along the streambanks of the Canadian River and its tributaries. It is likely that saltcedar has a substantial impact on the amount of water coming into Lake Meredith (CRMWA n.d.). In addition to direct water use of these plants by transpiration, heavily infested floodplain areas tend to trap floodwaters so that water loss is greatly increased. Saltcedar also draws salts up to the surface from deep in the soil, increasing the salinity of the streamflow (CRMWA 2005). Many reptiles, amphibians, and birds use habitat dominated by saltcedar. However, according to one report, saltcedar-dominated landscapes do not provide suitable habitat for more specialized birds, such as woodpeckers and birds that live in cavities. Dense tracts of pure saltcedar are typically unfavorable for most wildlife, and many birds still prefer native cottonwood habitat (Shafroth, Brown, and Merritt 2010). The presence of nonnative plants like saltcedar create long-term moderate to major impacts to fish habitat if left unchecked. However, the Entomology Program at the Texas A&M Research and Extension Center began a cooperative effort with the BOR in 2002 to develop a biological control program for saltcedar at Lake Meredith. In 2004, as part of a research study, planned releases of *Diorhabda elongata*, a chrysomelid beetle that is an aggressive defoliator of saltcedar, were carried out at two sites at the national recreation area. CRMWA conducted aerial spraying in late August 2008 on a total of 5,298 acres. Herbicide was applied in an area starting at the southwest boundary of the national recreation area on the Canadian River at Rosita Flats, to the Sanford Dam. This treatment included the lakebottom (predrought) and much of the entire shoreline (Wimer 2009b) and was completed in September 2009. Treatment for saltcedar and other nonnative plants will continue by handcrews. Although methods of control could result in short-term minor to moderate adverse impacts to fish and other wildlife at Lake Meredith (e.g., water degradation from herbicides, habitat disruption from physical removal), the removal of saltcedar would result in long-term benefits for wildlife and wildlife habitat because it would result in more water in the area.

Another plant known for its competitive botanical edge in the desert landscape is mesquite (Sharp n.d.). Overgrazed rangelands, openings, and other clearings and areas once dominated by native grasses often become infested with mesquite, which over time dominates that landscape (TPWD 2007). As with

saltcedar, mesquite is fire-adapted, making fire management (via prescribed burns) difficult for land managers (Sharp n.d.). Managers of lands adjacent to the national recreation area spray mesquite to help control the invasive plants. Lake Meredith National Recreation Area benefits from this because it helps hinder the spread of the invasive vegetation.

As water levels continue to decrease at Lake Meredith, the national recreation area would likely explore additional forms of recreation for visitors to enjoy, including the recent plan to construct a recreational multi-use trail (NPS 2010c), as well as expanding existing non-aquatic recreation activities. A potential increase in ORV use due to low water levels in the national recreation area could contribute to the adverse impacts of ORVs on fish and other wildlife. The use of ORVs has also been a common means of transportation for visitors engaging in hunting in the national recreation area. Hunting is a popular activity at Lake Meredith National Recreation Area, with game species including dove, turkey, quail, duck, goose, and white-tailed and mule deer. Although the use of ORVs by hunters could result in short- and long-term moderate adverse impacts on fish and wildlife habitat, traveling off designated roads and outside of designated areas within the national recreation area is prohibited (NPS 2009c). Therefore, it is likely that the use of ORVs for hunting purposes would result in short- and long-term minor to moderate adverse impacts on fish and wildlife habitat. Hunting activities would result in short-term minor adverse impacts from the direct removal of wildlife individuals, and long-term minor to moderate adverse impacts from the continued removal of individuals within a species population over time.

Plans specifically related to ORV use that could contribute to cumulative impacts include the Resources Management Plan (NPS 1996), which provides goals for the national recreation area to address preserving national recreation area resources, including aquatic resources and habitat. In addition, the national recreation area is currently developing a GMP articulating the long-term vision to guide the management of the national recreation area for the next 15 to 20 years. The decision to develop a GMP is, in part, a response to changes in the recreation opportunities at Lake Meredith National Recreation Area because of changes in the lake level. The GMP directs the national recreation area in exploring different approaches to preserve the important recreational opportunities, natural resources, and cultural histories of the national recreation area (NPS n.d.c). Upon formal implementation of the plan, the national recreation area would continue the management of natural resources, including fish and wildlife habitat, in a manner consistent with law, NPS policy, and standards. The plan will also serve to identify resource protection zones within the national recreation area. These plans would result in long-term benefits for wildlife and wildlife habitat because they would further provide for the protection of species.

Wildland fires have historically played an important role in the area ecosystem. The Wildland Fire Management Plan (NPS 1998b) is the primary reference for conducting all fire management activities and is intended to help achieve the resource management objectives as presented in the Resource Management Plan. The perpetuation of natural resources and their associated processes is one of the highest priorities for the plan, which is based on a strategy of using prescribed burns and mechanical methods to remove excess fuel from the system, reducing the likelihood of major wildfires and providing benefits to native vegetation and wildlife habitat. Fire management plans are considered a key tool in maintaining and improving current levels of grassland resources by promoting the restoration of uplands to native grasses and controlling brush such as mesquite (CRMWA 2005), which would result in long-term beneficial impacts on wildlife and wildlife habitat in the national recreation area.

The TPWD Wildlife Action Plan (TPWD 2006) provides a statewide roadmap for research, restoration, management, and recovery projects addressing species of greatest conservation need and important habitats. Species of greatest conservation need include terrestrial, freshwater, and marine birds, mammals, reptiles, amphibians, invertebrates, fishes, and plants and plant communities (TPWD 2010). The plan is a requirement for the State Wildlife Grant program, as outlined by the USFWS, which provides state grants to address unmet wildlife conservation needs. In addition to analyzing detailed species information, the

plan also provides broad habitat information within various ecoregions of Texas. The plan recognizes the High Plains ecoregion of Texas, which includes Lake Meredith National Recreation Area, as a "secondary priority ecoregion." The plan explains that this ecoregion has experienced a high rate of conversion to cropland and is one of the least conserved in Texas. Threats to the region include fragmentation, damming of springs, streams and rivers, and surface mining. The Wildlife Action Plan also recognizes the Canadian River Basin in an analysis of various Texas river basins, and explains that threats to the basin include increased silt loads from erosion, which could affect the suitability of riverine habitat, invertebrate production, and fish species survival. While the plan does not identify ORV use as a contributing factor to resource damage within this ecoregion and river basin, ORV activities and management will likely have implications related to the various strategies outlined in this plan/EIS. The plan has recently been updated and is now referred to as the Texas Conservation Action Plan (TPWD 2012). The Texas Conservation Action Plan will continue to provide long-term benefits to wildlife and wildlife habitat.

The overall impact of these past, current, and future actions on wildlife and wildlife habitat would be long term, moderate, and adverse as well as long term and beneficial, and when combined with the short- and long-term moderate adverse impacts under alternative A, would result in long-term moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat in the area of analysis.

Conclusion

Localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat would result from species disturbance and displacement, habitat damage and fragmentation, and individual mortality. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system, one purpose of which would be the separation of visitor uses that have the potential to conflict with one another. Established zones could include camping -only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones.

As described in alternative A, ORV use causes wildlife and wildlife habitat disturbance, especially when it occurs off designated routes (either inadvertently or intentionally). Along with habitat fragmentation, disturbance can lead to altered species range and social patterns, as well as individual mortality, resulting in short- and long-term moderate adverse impacts. However, under alternative B, the establishment of specific routes and zones, including camping -only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones, would reduce the potential for wildlife/vehicle collisions, as well as disturbance of those species that use the habitat in zones protected from ORV use. Likewise, signs would be posted prohibiting ORV use in isolated pools during times of drought, which would contribute to long-term benefits for fish and wildlife that use the water as habitat or to drink. Additional species management measures would be implemented to further the protection of the Arkansas River shiner, which would also provide additional long-term benefits to other wildlife in the area. These measures, common to all action alternatives, include the prohibition of driving in isolated pools, allowing parking/staging only in areas outside the wetted channel of the Canadian River, allowing access to the river only from designated access points, conducting studies every two to four years to determine if use is occurring outside the designated routes and areas, including species protection information within educational permit materials, increased enforcement, and developing a monitoring plan to ensure these measures are implements. In

addition, the superintendent always retains the authority to close any portion of the national recreation area for protection of park resources. As described for alternative A, noise is an environmental stressor that can result in adverse impacts on wildlife. Due to these effects, the NPS would establish muffler requirements for all motorized vehicles, which would reduce noise disturbance to wildlife in the national recreation area.

Headlight/taillight requirements would also be established under alternative B. Increased visibility for ORV users along existing ORV routes that would remain open would reduce the potential for wildlife/vehicle collisions at night. Motorized routes are known to reduce effective habitat for many species, including deer. Depending on the species, 0.12 mile (200 meters) up to 0.5 mile (805 meters) on either side of a road or motorized trail may no longer be usable habitat (New Mexico EMNRD et al. 2008). Less mobile species, such as smaller mammals, reptiles, and amphibians, are more likely to be affected in the immediate vicinity of ORV routes.

Law enforcement would be increased at both ORV use areas to ensure resource protection and enforce new ORV rules and regulations. Although short-term negligible to minor adverse impacts would result from low levels of ORV use by law enforcement staff, the overall impact of increased law enforcement at Blue Creek and Rosita Flats would be long term and beneficial from the increased enforcement of resource protection. In addition, in order to encourage compliance, portions of ORV use areas could be closed temporarily to the public if evidence of ORV use is found outside designated routes. Alternative B would also include a no-charge permit system, which would be issued to ORV users once educational materials are read and permits are signed for. The NPS would revoke permits if riders are found off designated routes. If a rider violates the rules in any of the ORV use areas three times, the rider would be permanently barred from receiving any kind of public use permit at the national recreation area. Temporary closures of the ORV use areas, as well as the implementation of permits, would result in long-term benefits for wildlife and wildlife habitat from increased resource protection by enforcing ORV rules.

Under alternative B, ORV use at Blue Creek and Rosita Flats would be prohibited on vegetation, which would contribute to long-term benefits to wildlife and habitat by reducing a source of habitat and species disturbance, allowing these areas to recover. Recovery of these areas could eventually reduce habitat fragmentation in the Rosita Flats and Blue Creek ORV use areas, especially for less mobile species such as smaller mammals, reptiles, and amphibians. However, other species would also ultimately benefit from less fragmented habitat. Beneficial effects would also occur by educating visitors about ORV rules and safety through signs, literature, and park and community events.

The implementation of designated ORV access points at the riverbed would protect fish and wildlife habitat at Rosita Flats by localizing impacts (i.e., damage to habitat) to certain areas along the river. However, long-term moderate adverse impacts on fish would result from the continued use of ORVs in the riverbed introducing direct habitat disturbance and adversely affecting water quality. Other factors under alternative B would contribute to long-term benefits for wildlife and wildlife habitat at the Rosita Flats area, including the use of post -and -cable fencing to better define where ORV use is permitted. Where posts and cables and signs are installed to better define permitted ORV use areas, long-term benefits would result because vegetation outside ORV use areas would be protected from ORVs and would be able to recover, hence increasing the amount of suitable habitat for wildlife at the national recreation area.

Because alternative B would include a zoning system, designated access points at the riverbed at Rosita Flats, and increased resource management and law enforcement, the overall impact of alternative B on wildlife and wildlife habitat would be expected to be short and long term, minor, and adverse. Impacts would most likely be short term in areas removed from vehicle routes. Impacts could be long term at localized areas along ORV routes due to continued disturbance along those routes.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have the potential for impacts under alternative B would be identical to those under alternative A. The overall impact of these past, current, and future actions on wildlife and wildlife habitat would be long term, moderate, and adverse and long term and beneficial, and when combined with the short- and long-term minor adverse impacts under alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat in the area of analysis.

Conclusion

Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to continued use of ORVs in the Rosita Flats and Blue Creek ORV use areas, impacts would be less than under alternative A as a result of increased resource management. The use of a zone system, including a resource protection zone, as well as restrictions on driving in isolated pools in times of drought, designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Therefore, overall impacts under alternative B would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.

Impacts of Alternative C: Management through Use of a Permit System at Current ORV Use Areas

Under alternative C, the national recreation area would manage ORV use through a permitting system as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except there would be one designated ORV use area in Rosita Flats instead of two.

As described in alternative A, ORV use causes wildlife and wildlife habitat disturbance, especially when it occurs off designated routes (either inadvertently or intentionally). Along with habitat fragmentation, disturbance can lead to altered species range and social patterns, decreased biodiversity, and individual mortality, resulting in short- and long-term moderate adverse impacts. However, under alternative C, a monitoring plan would be developed that would look at vegetation, erosion, and other predetermined factors that could assist in protecting fish and wildlife habitat. In addition, the use of a fee-based permitting system required to access ORV use areas and the development of use limits would contribute to long-term benefits for fish and other wildlife by limiting habitat disturbance and fragmentation, as well as reducing the potential for wildlife/vehicle collisions. As described in alternative B, motorized routes are known to reduce effective habitat for many species, including deer. However, less mobile species such as smaller mammals, reptiles, and amphibians are more likely to be affected by vehicle collisions in the ORV use areas. An ORV use limit would be implemented based on indicators and standards developed through the GMP process. The development of a use limit would result in long-term benefits for wildlife by limiting the number of vehicles in the ORV use areas and reducing the disturbance of habitat and the potential for wildlife/vehicle collisions. A use limit would reduce noise disturbance in the national recreation area, which would benefit all wildlife species, especially birds, deer, and other mammals.

Similar to alternative B, recommended speed limits in ORV use areas and vehicle requirements (muffler and headlight/taillight requirements) under alternative C would contribute to long-term benefits. As described for alternative B, ORV use limits and vehicle requirements would reduce the likelihood of ORV

users striking wildlife due to reduced visibility or reaction time, as well as decreasing noise disturbance. As described under alternative B, increased law enforcement under alternative C could result in short-term negligible to minor adverse impacts from low levels of ORV use by law enforcement staff; however, the overall impact of increased law enforcement at Blue Creek and Rosita Flats would be long term and beneficial from the increased enforcement of resource protection. In addition, increased law enforcement under alternative C would be further enhanced by aerial imagery to track new user-created routes and noncompliance, helping ensure that ORV users comply with rules and regulations established to protect natural resources. The national recreation area would explore options for having law enforcement staff located closer to the Rosita Flats ORV use area, which would assist in the protection of resources by enforcing compliance with regulations regarding ORV use at the national recreation area.

Unique to alternative C is the designation of camping sites as well as tent camping in areas that have no vegetation or previously disturbed vegetation. In tent camping areas, visitors in these areas would be required to walk to their campsites because vehicles must be parked off vegetation along designated ORV routes or areas. This requirement would protect undisturbed vegetation and wildlife habitat from future disruption and damage, and could potentially assist in vegetation recovery by limiting access of ORVs to specific areas of the national recreation area.

Under alternative C, as with alternative B, ORV use at Blue Creek and Rosita Flats would be prohibited on vegetation, which would contribute to long-term benefits for wildlife and habitat as a result of removing a source of habitat and species disturbance, allowing these areas to recover. Recovery of these areas could eventually reduce habitat fragmentation, especially for smaller mammals, reptiles and amphibians, and some ground- and shrub-nesting birds. As described for alternative B, beneficial effects would also occur by educating visitors about ORV rules and safety through signs, literature, and park and community events. Similar to alternative B, ORV users would be required to read and sign educational materials prior to obtaining a permit. The NPS would revoke ORV use permits if riders are found off designated routes, which would assist in ensuring compliance with recreational use rules.

Like alternative B, the use of post -and -cable fencing to better define where ORV use is permitted would contribute to long-term benefits by reducing the likelihood of ORVs driving outside designated areas/routes. Also similar to alternative B, the implementation of designated access points at the riverbed, prohibition of driving in isolated pools, and implementing other actions for the protection of the Arkansas River shiner (see alternative B) would localize impacts to fish and wildlife habitat; however, long-term moderate adverse impacts to fish would result from continued use of ORVs in the riverbed.

Because alternative C would include use limits, a fee-based permitting system, designated access points at the riverbed at Rosita Flats, an interpretive wayside program, and increased resource protection and law enforcement, the overall impact of alternative C on wildlife and wildlife habitat would be expected to be short and long term, minor, and adverse. Impacts would most likely be short term in areas removed from vehicle routes, because the impacts would likely be noise-related and would be temporary. Impacts could be long term, minor, and adverse in localized areas along ORV routes due to continued disturbance along those routes.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have the potential for impacts under alternative C would be identical to those under alternative A. The overall impact of these past, current, and future actions on wildlife and wildlife habitat would be long term, moderate, and adverse as well as long term and beneficial, and when combined with the short- and long-term minor adverse impacts under alternative C, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat in the area of analysis.

Conclusion

Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to the continued use of ORVs in the Blue Creek and Rosita Flats ORV use areas, the impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative C. The development of a monitoring plan and interpretive wayside program, the implementation of use limits and permitting system, the designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term minor adverse impacts of alternative C, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.

IMPACTS OF ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

Under alternative D the national recreation area would, in part, base the designation of routes and areas on a zoning system, one of the purposes of which would be the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee -permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area, but no use limits would be established.

As described under alternative A, ORV use causes wildlife and wildlife habitat disturbance, especially when it occurs off designated routes (either inadvertently or intentionally). Along with habitat fragmentation, disturbance can lead to altered species range and social patterns, decreased biodiversity, and individual mortality, resulting in short- and long-term moderate adverse impacts. However, the establishment of designated routes and zones under alternative D would reduce the potential for such disturbances to occur. Posted speed limits would reduce the potential for wildlife/vehicle collisions, and the restriction of ORV use to designated zones would eliminate ORV impacts in areas protected from ORV use, including impacts on vegetation and habitat, as well as noise-related impacts that contribute to habitat avoidance and changes in behavior and physiology. In addition, ORV use on vegetation would be prohibited, which would reduce habitat and species disturbance, allowing certain areas to recover. Signs would be posted prohibiting ORV use in isolated pools during times of drought, which would contribute to long-term benefits for fish and other wildlife that use isolated pools as habitat or to drink. Protection measures implemented for the Arkansas River shiner (detailed under alternative B) would provide additional protection to other species within the recreation area. Muffler and headlight/taillight requirements would also reduce disturbances to wildlife, as described under alternative B.

Similar to alternative C, tent camping sites would be designated under alternative D. In tent camping areas, visitors would be required to walk to their campsites because vehicles must be parked off vegetation along designated ORV routes or areas. As described for alternative C, this requirement would protect undisturbed vegetation and wildlife habitat from disruption and damage, and allow vegetation recovery by limiting ORV access to specific areas of the national recreation area.

As with alternative B, new resource protection rules and regulations would be established under alternative D, including increased law enforcement. Also similar to alternative B, increased law enforcement under alternative D could result in short-term negligible to minor adverse impacts; however, the overall impact of increased law enforcement at Blue Creek and Rosita Flats would be beneficial in the long term due to the increased enforcement of resource protection.

As described under alternative C, the fee-based permit system would ultimately exclude ORV riders who are caught repeatedly violating the resource protection rules. The permit system would also seek to educate ORV users about ORV rules and resource protection. For these reasons, the fee-based permit system would have a long-term beneficial impact on wildlife and wildlife habitat. Beneficial impacts from designating ORV access points to the Canadian River and using post -and -cable fencing to delineate ORV areas would be the same as those described under alternative C.

In these ways, the implementation of the zoning system would reduce the impact of ORVs on wildlife and wildlife habitat in the Blue Creek and Rosita Flats ORV use areas. The overall impact of alternative D on wildlife and wildlife habitat in these areas would therefore be short and long term, minor, and adverse. As described for the other alternatives, impacts would most likely be short term in areas removed from vehicle routes, and long term at localized areas along ORV routes due to the continued ORV use there.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have the potential for impacts affecting the Blue Creek and Rosita Flats ORV use areas under alternative D would be identical to those described under alternative A. The overall impact of these past, current, and future actions on wildlife and wildlife habitat would be long term, moderate, and adverse, and when combined with the short- and long-term minor adverse impacts under alternative D for Blue Creek and Rosita Flats, would result in long-term minor adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.

Conclusion

Although the continued use of ORVs at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat, impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative D. The implementation of a zoning system and fee-based permitting system, as well as the enactment of resource protection rules, such as the headlight/taillight and muffler requirements and the prohibition on driving on vegetation, would result in long-term beneficial impacts on wildlife and wildlife habitat at the Blue Creek and Rosita Flats ORV use areas. Additional beneficial impacts would result from prohibitions on driving through isolated pools, establishing designed access point to the river, and implementing protection measures for the Arkansas River shiner (which would also benefit other species). Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor adverse impacts under alternative D, would result in long-term minor adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.

THREATENED AND ENDANGERED SPECIES / SPECIES OF CONCERN

GUIDING REGULATIONS AND POLICIES

The ESA (16 USC 1531 et seq.) mandates that all federal agencies consider the potential effects of their actions on species listed as threatened or endangered. If the NPS determines that an action may affect a federally listed species, consultation with the USFWS is required to ensure that the action would not jeopardize the species' continued existence or result in the destruction or adverse modification of critical habitat. Section 2 of the ESA states, "all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act" (16 USC 1531[c][1]). Section 7(a)(1) of the ESA states,

> The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of this Act. (16 USC 1536(a)(1).

NPS *Management Policies 2006* states that the NPS will survey for, protect, and strive to recover all species native to NPS units that are listed under the ESA, and proactively conserve listed species and prevent detrimental effects on these species (NPS 2006b, Section 4.4.2.3). NPS *Management Policies 2006* also states, "[the NPS will] manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible" (NPS 2006b, Section 4.4.2.3).

SPECIES TO BE EVALUATED

As described in chapter 3, the Arkansas River shiner is listed as threatened by the USFWS. Within the national recreation area, this species is present in the Canadian River, from Chicken Creek upstream to the U.S. Highway 287 bridge, which runs through the Rosita Flats ORV use area (Wilde 2010). The Arkansas River shiner does not occur in the Blue Creek ORV use area and park staff is unaware of any historical existence of the species in that area. In addition, the Blue Creek area does not contain habitat that would be conducive to or support future Arkansas River shiner populations (Wimer 2010b). Therefore, evaluation of the effects of ORV management actions on the Arkansas River shiner focuses exclusively on the Rosita Flats ORV use area, where the existence of the fish has been confirmed.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

The following information was used to assess impacts on the Arkansas River shiner from ORV management actions:

- The existence of the species in areas likely to be affected by actions described in the alternatives.
- Habitat loss or alteration caused by the alternatives.
- Displacement and disturbance potential of the actions and the species' potential to be affected by the activities.

Potential impacts on the federally threatened Arkansas River shiner were evaluated based on available data on the species' past and present existence at Lake Meredith National Recreation Area, scientific literature on the species, life history, scientific studies on the impacts of human disturbance on the shiner, and documentation of the species' association with humans and ORVs. Information on habitat and other existing data were acquired from staff at Lake Meredith National Recreation Area, the USFWS, and available literature.

Following are the intensity definitions for evaluating impacts on the Arkansas River shiner.

Negligible: There would be no observable or measurable impacts on the Arkansas River shiner, its habitat, or the natural processes sustaining it. Impacts would be well within natural fluctuations.

Minor: Impacts on the Arkansas River shiner, its habitat, or the natural processes sustaining it would be detectable, but would not be outside the natural range of variability. Occasional responses by some individuals to disturbance could be expected, but without interference to feeding, spawning, or other factors affecting population levels. Sufficient habitat in the national recreation area would remain functional to maintain a sustainable population in the national recreation area.

Moderate: Impacts on the Arkansas River shiner, its habitat, or the natural processes sustaining it would be detectable and could be outside the natural range of variability. Frequent responses by some individuals to disturbance could be expected, with some negative impacts on feeding, spawning, or other factors affecting local population levels. Some impacts might occur during critical periods of reproduction or in key habitats in the national recreation area and result in injury or mortality to one or more individuals. However, sufficient population numbers and habitat in the national recreation area would remain functional to maintain a sustainable population in the national recreation area.

Major: Impacts on the Arkansas River shiner, its habitat, or the natural processes sustaining it would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Frequent responses by some individuals to disturbance would be expected, with negative impacts on feeding, spawning, or other factors resulting in a decrease in national recreation area population levels or a failure to restore levels that are needed to maintain a sustainable population in the national recreation area. Impacts would occur during critical periods of reproduction or in key habitats in the national recreation area and result in direct mortality or loss of habitat. Local population numbers, population structure, and other demographic factors might experience large declines.

Duration: Short-term effects would last up to one year.

Long-term effects would last more than one year.

Study Area

The study area for the Arkansas River shiner is defined as the Rosita Flats ORV use area for the analysis of the impacts of the alternatives and defined as Lake Meredith National Recreation Area and adjacent land for the analysis of cumulative impacts.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, the management of ORV use and access at the national recreation area would be a continuation of management based on the 2007 *Interim OHV Use Plan* (NPS 2007a), the regulations contained in 36 CFR 7.57, and the Superintendent's Compendium. ORV use would continue to be permitted throughout Rosita Flats below the 3,000-foot elevation line.

As described for wildlife and wildlife habitat, ORVs cause long-lasting damage to land and aquatic ecosystems, wildlife, soils, and hydrologic flows. Even if all ORV users stay on designated trails, they cause erosion and stream sedimentation, transport invasive species, disrupt and damage wildlife, and

reduce effective habitat. Motorized road and trail crossings through aquatic habitats degrade water quality, affect bank stability, damage riparian vegetation, and increase stream deposition, thus reducing habitat quality for aquatic species, including fish and their aquatic insect food sources (New Mexico EMNRD et al. 2008). Soils classified as having moderate or high erosion potential are located along the edges of the Rosita Flats ORV use area. Sedimentation of surface waters of the national recreation area would continue to result from the ongoing erosion of soils due to ORV use. Incremental contributions to existing surface water quality impairments would also result from runoff of MTBE, as previously described under the soils analysis.

As described in chapter 3, factors contributing to the decline of the Arkansas River shiner include modification of the duration and timing of streamflows, habitat loss, stream depletion, and water quality degradation (70 FR 59828). In addition, it is common for rivers and streams to dry up in the national recreation area, leaving fish congregated in puddles and vulnerable to impacts from ORVs that drive through the puddles (Wimer 2010a). The continued use of ORVs at Rosita Flats would likely result in habitat disturbance, degraded water quality due to soil erosion and sedimentation, and disruption of the reproductive cycle due to the potential for injury and direct mortality during all life stages, leading to short- and long-term moderate adverse impacts on the Arkansas River shiner. The lack of designated routes, use limits, and the lack of restrictions on the hours of vehicle operation would add to the long-term adverse impacts of ORV use at Rosita Flats, because an unlimited number of ORVs would have unrestricted access to the riparian habitat of the Arkansas River shiner.

Although Rosita Flats has bulletin boards with campground rules and regulations and other park information, no interpretation services would be provided at Rosita Flats under alternative A. Education would continue to occur primarily through visitor contact with rangers, park staff, and on-site educational opportunities; however, patrolling by park law enforcement occurs less frequently at Rosita Flats than at Blue Creek due to the remote location of Rosita Flats. The lack of interpretation and education services at the Rosita Flats ORV use area would contribute to long-term minor adverse impacts on the Arkansas River shiner from limited awareness of sensitive habitat, which would be further exacerbated by limited law enforcement patrols due to the remote location of Rosita Flats.

In summary, continued management of ORV use at the Blue Creek and Rosita Flats areas under alternative A would likely result in short- and long-term moderate adverse impacts on the Arkansas River shiner.

Cumulative Impacts

Other past, present, and future planning actions within and around the national recreation area have the potential to impact the Arkansas River shiner. Prior to the establishment of Lake Meredith as a public recreation area in 1964, the Canadian River and Blue Creek riparian areas were used by the local community for recreation. In the 1960s, OHV use consisted of a few river buggies made from old vehicles converted to operate in the river bottom. Given the length of time ORV use has been occurring at Lake Meredith, it is difficult to measure resource impacts because there is no baseline to measure against (NPS 2007a). The Rosita Flats and Blue Creek ORV use areas were officially designated by a special regulation (36 FR 7.57) in the 1970s. It is likely that large-scale efforts to protect vegetation and wildlife at Rosita Flats and Blue Creek did not begin until 1990, when Lake Meredith National Recreation Area was established. Therefore, it is likely that prior to the establishment of the national recreation area, ORV use along the Canadian River at Rosita Flats contributed to long-term moderate to major adverse impacts on Arkansas River shiner habitat. These impacts were caused by vehicles operating in aquatic habitat, leading to reduced water quality from sediment delivery, habitat fragmentation, and direct mortality of Arkansas River shiners (both adult and juvenile) and shiner eggs.

Lake Meredith was created by the construction of the Sanford Dam on the Canadian River to allow the impoundment and diversion of water for 11 municipalities of the Texas Panhandle. Although the dam assists in protecting downstream vegetation by preventing uprooting from large-scale floods, the damming of the Canadian River has resulted in long-term moderate to major adverse impacts on the Arkansas River shiner by inhibiting frequent natural flooding, which is important in maintaining the shiner's habitat and helps it compete with invading nonnative aquatic species. The dam has eliminated stream habitat, limiting the amount of habitat necessary to provide the Arkansas River shiner with the 130 miles of unimpounded, flowing water it needs to successfully complete its reproductive cycle (USFWS 2005d).

In recent years, the Lake Meredith water level has continued to drop. The lake water level, with a record high of 101.8 feet in April 1973 (Welch 2010), has drained from 87 feet at the beginning of the decade (Blackburn 2010) to a record low of 26.14 feet in August 2013 (CRMWA 2014). The decreasing water level is as a result of too little rain in the area feeding the creeks and the Canadian River, which supply the lake (Amarillo Globe-News 2010; CRMWA n.d.). Over the past 10 years, rainfall that has occurred over much of the state has not occurred within Lake Meredith's watershed. Even in years where near normal rainfall totals have occurred, those rains have not been of the intensity and duration needed to generate significant runoff; it is the large storm events that make a difference in lake levels (CRMWA n.d.). Additionally, the High Plains aquifer (which includes the Ogallala aquifer) underlies parts of eight states, including Texas, and has been intensively developed for irrigation. Since establishment of the recreation area, water levels have declined more than 100 feet in some areas and the saturated thickness has been reduced by more than half in others (USGS 2011). The depletion of groundwater in the area contributes to the decreasing lake levels in the national recreation area and a reduction in stream habitat. Decreasing water levels pose a substantial threat to native fish in the area, including the Arkansas River shiner, resulting in long-term minor to moderate adverse impacts. Microhabitat selection by the Arkansas River shiner is highly influenced by water depth and current velocity (USFWS 2005b). In addition, a reduction in available habitat often leads to fish being congregated in small to large puddles of water, leaving them more vulnerable to disruption.

Cottonwoods have a high water requirement and grow in old streambeds and damp, low-lying areas where they have access to water (Gober n.d.). Cottonwoods are likely to absorb existing water from puddles, ponds, and streams, leading to reduced habitat availability for the Arkansas River shiner. Further reduction in available habitat for the Arkansas River shiner would contribute to the existing long-term minor to moderate adverse impacts of water loss.

Another contributor to water loss and degradation in the national recreation area and region is the invasion of nonnative plant species, which compete with native plants like cottonwood. Saltcedar, or tamarisk, is an invasive plant that exists throughout Texas and extensively infests the national recreation area. Saltcedar spreads quickly and is known to deplete streamflow and produce water quality changes that are not favorable to the Arkansas River shiner (CRMWA 2005). It is estimated that one large saltcedar can use 200 gallons of water per day or one acre can use 3 to 7 acre-feet of water per year (Texas State Soil & Water Conservation Board 2009). Saltcedar has become common along the streambanks of the Canadian River and its tributaries. It is likely that saltcedar has a substantial impact on the amount of water coming into Lake Meredith (CRMWA n.d.). In addition to direct water use of these plants by transpiration, heavily infested floodplain areas tend to trap floodwaters so that water loss is greatly increased. Saltcedar also draw salts up to the surface from deep in the soil, increasing the salinity of the streamflow (CRMWA 2005). The presence of nonnative plants like saltcedar pose long-term moderate to major threats to Arkansas River shiner habitat if left unchecked. However, the Entomology Program at the Texas A&M Research and Extension Center began a cooperative effort with the BOR in 2002 to develop a biological control program for saltcedar at Lake Meredith. In 2004, as part of a research study, planned releases of *Diorhabda elongata*, a chrysomelid beetle that is an aggressive defoliator of

saltcedar, were carried out at two sites at the national recreation area. CRMWA conducted aerial spraying in late August 2008 on a total of 5,298 acres. Herbicide was applied in an area starting at the southwest boundary of the national recreation area on the Canadian River at Rosita, to the Sanford Dam. The treatment included the lakebottom (predrought) and much of the entire shoreline (Wimer 2009b) and was completed in September 2009. Treatment for saltcedar and other nonnative plants will continue by handcrews. Although methods of control could result in short-term minor to moderate adverse impacts on the Arkansas River shiner (i.e., water degradation from herbicides, habitat disruption from physical removal, etc.), the removal of saltcedar would result in long-term benefits for the Arkansas River shiner and its associated habitat because it would result in more water in the area.

Another plant known for its competitive botanical edge in the desert landscape is mesquite (Sharp n.d.). Overgrazed rangelands, openings, and other clearings and areas once dominated by native grasses often become infested with mesquite, which over time dominates that landscape (TPWD 2007). As with saltcedar, mesquite is fire-adapted, making fire management (via prescribed burns) difficult for land managers (Sharp n.d.). Managers of lands adjacent to the national recreation area spray mesquite to help control the invasive plants. Lake Meredith National Recreation Area benefits from this because it helps hinder the spread of the invasive vegetation.

As water levels continue to decrease at Lake Meredith, the national recreation area will likely explore additional forms of recreation for visitors to enjoy, including the recent plan to construct a recreational multi-use trail (NPS 2010c) and expand existing non-aquatic recreation activities. A potential increase in ORV use due to low water levels in the national recreation area could contribute to the adverse impacts of ORVs on the Arkansas River shiner. The use of ORVs has also been a common means of transportation for visitors engaging in hunting in the national recreation area. Hunting is a popular activity at the national recreation area, with game species including dove, turkey, quail, duck, goose, and white-tailed and mule deer. Although the use of ORVs by hunters could result in short- and long-term moderate impacts on fish and wildlife habitat, traveling off designated roads and outside of designated areas within the national recreation area is prohibited (NPS 2009c). Therefore, it is likely that the use of ORVs for hunting purposes would result in short- and long-term minor adverse impacts on Arkansas River shiner habitat.

Plans specifically related to ORV use that could contribute to cumulative impacts include the Resources Management Plan (NPS 1996), which provides goals for the national recreation area that address preserving national recreation area resources, including aquatic resources and habitat. In addition, the national recreation area is currently developing a GMP articulating the long-term vision to guide the management of the national recreation area for the next 15 to 20 years. The decision to develop a GMP is, in part, a response to changes in the recreation opportunities at Lake Meredith because of changes in the lake level. The GMP directs the national recreation area in exploring different approaches to preserve the important recreational opportunities, natural resources, and cultural histories of the national recreation area (NPS n.d.c). Upon formal implementation of the plan, the national recreation area would continue the management of natural resources, including the Arkansas River shiner and its associated habitat, in a manner consistent with law, NPS policy, and standards. The plan will also serve to identify resource protection zones within the national recreation area. These plans would result in long-term benefits for the Arkansas River shiner and its associated habitat because they would further provide for the protection of the species.

Wildland fires have historically played an important role in the area's ecosystem. The Wildland Fire Management Plan (NPS 1998b) for Lake Meredith National Recreation Area is the primary reference for conducting all fire management activities and is intended to help achieve the resource management objectives as presented in the Resource Management Plan. The perpetuation of natural resources and their associated processes is one of the highest priorities for the plan, which is based on a strategy of using

prescribed burns and mechanical methods to remove excess fuel from the system, reducing the likelihood of major wildfires and providing benefits to native vegetation and wildlife habitat. Fire management plans are considered a key tool in maintaining and improving current levels of grassland resources by promoting the restoration of uplands to native grasses and controlling brush such as mesquite (CRMWA 2005), which would result in long-term beneficial impacts on the Arkansas River shiner and its associated habitat.

The TPWD Wildlife Action Plan (TPWD 2006) provides a statewide roadmap for research, restoration, management, and recovery projects addressing species of greatest conservation need and important habitats. Species of greatest conservation need include terrestrial, freshwater, and marine birds, mammals, reptiles, amphibians, invertebrates, fishes, and plants and plant communities (TPWD 2010). The plan is a requirement for the State Wildlife Grant program, as outlined by the USFWS, which provides state grants to address unmet wildlife conservation needs. In addition to analyzing detailed species information, the plan also provides broad habitat information within various ecoregions of Texas. The plan recognizes the High Plains ecoregion of Texas, which includes Lake Meredith National Recreation Area, as a "secondary priority ecoregion." The plan explains that this ecoregion has experienced a high rate of conversion to cropland and is one of the least conserved in Texas. Threats to the region include fragmentation, damming of springs, streams, and rivers, and surface mining. The Wildlife Action Plan also recognizes the Canadian River Basin in an analysis of various Texas river basins, and explains that threats to the basin include increased silt loads from erosion, which could affect the suitability of riverine habitat, invertebrate production, and Arkansas River shiner survival. While the plan does not identify ORV use as a contributing factor to resource damage in this ecoregion and river basin, ORV activities and management will likely have implications related to the various strategies outlined in this plan/EIS. The plan has recently been updated and is now referred to as the Texas Conservation Action Plan (TPWD 2012). The Texas Conservation Action Plan will continue to provide long-term benefits to wildlife and wildlife habitat.

The USFWS initiated the evaluation of potential critical habitat along the Canadian River from U.S. Highway 54 in New Mexico to the mouth of Coetas Creek in the central Texas Panhandle, a location within the bounds of Lake Meredith National Recreation Area. This proposed area, Unit 1a, was excluded from the final rule designating critical habitat for the Arkansas River shiner in 2005; however, the USFWS states that Unit 1a "supports a viable population of the species and is considered to be within the 'core' of the Arkansas River shiner population." Unit 1a was excluded because the majority of this reach is in private ownership, except for the small segment located within the boundaries of Lake Meredith. In addition, the USFWS felt that the benefits of excluding the units from this final critical habitat designation outweighed the benefits of designating the unit as critical habitat due to the development and partial implementation of a conservation/management plan for the Arkansas River shiner (USFWS 2005c). Although critical habitat is designated in the national recreation area, the implementation of a conservation/management plan and the acknowledgment of the area as supporting a viable population contribute to long-term benefits for the Arkansas River shiner.

Although some past, present, and future actions have contributed and would contribute to long-term benefits for the Arkansas River shiner, the benefits are primarily localized and a result of management actions. In addition to these beneficial management actions, there are adverse impacts that have resulted from habitat loss and degradation caused by the presence of the dam, invasive species, recreational activities, and water loss. Therefore, the overall impact of these past, current, and future actions on the Arkansas River shiner would be long term, moderate, and adverse. When combined with the short- and long-term moderate adverse impacts under alternative A, long-term moderate adverse cumulative impacts on the Arkansas River shiner would result in the area of analysis.

Conclusion

Under alternative A, short- and long-term moderate adverse effects on the Arkansas River shiner could occur as a result of localized impacts including disturbance, mortality, or damage to/loss of habitat. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse cumulative impacts on the Arkansas River shiner.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B the national recreation area would designate routes and areas based on a zoning system that would separate potentially conflicting visitor uses. Established zones could include camping-only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones.

As described for alternative A, the continued use of ORVs in the national recreation area would pose a threat to the Arkansas River shiner due to habitat disturbance, degraded water quality due to soil erosion and sedimentation, disruption of the reproductive cycle, and/or direct mortality, leading to short- and long-term moderate adverse impacts on the Arkansas River shiner.

Management measures including prohibiting parking or staging of any kind of vehicles adjacent to or in the river, restricting ORV use to designated routes, and implementing designated ORV access points at the riverbed and resource protection zones under alternative B would contribute to the protection of the Arkansas River shiner habitat at Rosita Flats by limiting ORVs from driving through riparian habitat and localizing impacts to certain areas. Limiting ORV use in riparian habitat would minimize erosion by avoiding highly erodible soils and would minimize sedimentation by protecting vegetation. However, long-term moderate adverse impacts on the Arkansas River shiner would persist from the continued use of ORVs in the riverbed. Additional protection would be offered from the establishment of a resource protection zone. This zone, an area of approximately 1,040 acres, would be established north and east of the Bull Taco Hill ORV use area to protect vegetation and reduce oil erosion. This zone would permit only vehicles with a wheel width of 64 inches or less, reducing disturbance in these areas.

Signs would be posted prohibiting ORV use in isolated pools during times of drought, which would help mitigate the adverse impacts of ORV use by preventing ORVs from driving through puddles containing congregated fish. The use of post-and-cable fencing and signs under alternative B to identify specific zone boundaries would further protect the shiner by reducing the likelihood of ORVs driving outside designated areas/routes, which can result in the destruction of habitat (e.g., erosion and sedimentation) and direct mortality of Arkansas River shiners (both adult and juvenile) and shiner eggs.

Law enforcement would be increased at the Rosita Flats ORV use area to assist in resource protection and enforce new ORV rules and regulations. Although short-term negligible to minor adverse impacts could result from low levels of ORV use by law enforcement staff, the overall impact of increased law enforcement at Rosita Flats would be long term and beneficial from the increased enforcement of resource protection. In addition, in order to encourage compliance, portions of designated ORV use areas could be closed temporarily to the public if evidence of ORV use is found outside designated routes or if degraded resource conditions (excessive rutting, erosion, etc.) are present. Every 2 to 4 years, aerial photography would be used to determine if ORV use is occurring outside of designated routes and areas.

Alternative B would also include a no-charge permit system, which would be issued to ORV users once educational materials are read and permits are signed for. Educational messages would include

information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points, as well as information about the Arkansas River shiner. These materials could contain the statement, “The U.S. Fish and Wildlife Service recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed.” The NPS would revoke permits if riders are found off designated routes, which can result in destruction of riparian habitat (e.g., erosion and sedimentation) and direct mortality of Arkansas River shiners (both adult and juvenile) and shiner eggs. If a rider violates the rules in any of the ORV use areas three times, the rider would be permanently barred from receiving any kind of public use permit at the national recreation area. Temporary closures of the ORV use areas if evidence of ORV use is found outside designated routes, as well as the implementation of permits, would help lessen the impacts of ORV use on the Arkansas River shiner by ensuring that ORV users stay on designated routes in order to preserve potentially sensitive shiner habitat. Additional educational materials concerning Arkansas River shiner protection could be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of Arkansas River shiner conservation.

Four to six times per week, on-the-ground NPS law enforcement would patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV violations. Monitoring for incidental take of the Arkansas River shiner would occur at this time. Law enforcement patrols may be added as funding from ORV permits becomes available under the various alternatives.

As described in chapter 2, the national recreation area would monitor the shiner population every three to five years to ensure that additional management is not necessary. Educational material would be provided when a visitor receives a permit that would include information about the prohibition of driving in full pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These protection measures would help mitigate the adverse impacts of ORV use on the shiner. In addition, the NPS would provide sufficient guidance to its employees and contracted employees to minimize incidental take and to ensure compliance with the terms and conditions of the biological opinion (USFWS 2014).

Because alternative B would include a zoning system, designated ORV access points at the riverbed, and increased resource management and law enforcement, the overall impact of alternative B on the Arkansas River shiner would be less than described for alternative A. However, unlimited ORV use would continue at Rosita Flats and ORVs would still be allowed in the riverbed. Therefore, the overall impact of alternative B would be expected to be short and long term, minor to moderate, and adverse.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have the potential for impacts under alternative B would be identical to those under alternative A. The overall impact of these past, current, and future actions on the Arkansas River shiner would be long term, moderate, and adverse, and when combined with the short- and long-term minor to moderate adverse impacts under alternative B, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner in the area of analysis.

Conclusion

Short- and long-term moderate adverse impacts on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the use of a zone system, including a resource protection zone, as well as designating ORV access points at the riverbed and restrictions on driving in isolated pools in times of drought, and the other protection measures outlined in the biological opinion would help mitigate these adverse impacts on Arkansas River shiner habitat.

Therefore, overall impacts under alternative B would be short and long term, minor to moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.

IMPACTS OF ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B.

As described for alternative A, the continued use of ORVs in the national recreation area would pose a threat to the Arkansas River shiner due to habitat disturbance, degraded water quality due to soil erosion and sedimentation, disruption of the reproductive cycle, and/or direct mortality, leading to short- and long-term moderate adverse impacts on the Arkansas River shiner. However, ORV use limits would be implemented based on indicators and standards developed through the GMP process. The development of use limits would help mitigate the adverse impacts of ORV use on the Arkansas River shiner and its associated habitat by limiting the number of ORVs operating in the national recreation area, thereby reducing their potential impacts on the Arkansas River shiner and its habitat. To assist in the implementation of the use limits, a monitoring plan would be developed that would address vegetation, erosion, and other predetermined factors, and which would increase awareness of habitat destruction and the potential for follow-up actions to protect species habitat.

In addition, a fee-based permit system would be established for access to ORV use areas. Similar to alternative B, ORV users would be required to read educational materials and sign for a user permit prior to obtaining the permit under alternative C, which would assist in protecting the Arkansas River shiner by educating ORV users about resource protection and reducing the likelihood of ORVs driving outside designated areas/routes. Educational messages for the permit would include information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These materials could also contain the statement, “The U.S. Fish and Wildlife Service recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed.” Additional educational materials concerning Arkansas River shiner protection could be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of Arkansas River shiner conservation.

As mentioned under alternative B, increased law enforcement under alternative C could result in short-term negligible to minor adverse impacts from low levels of ORV use by law enforcement staff; however, the overall impact of increased law enforcement at Rosita Flats would be long term and beneficial due to the increased enforcement of resource protection. In addition, increased law enforcement under alternative C would be further enhanced by aerial imagery to track new user-created routes/noncompliance, helping ensure that ORV users comply with rules and regulations that protect natural resources. Every two to four years, aerial photography would be used to determine if ORV use is occurring outside of designated routes and areas. The national recreation area would also explore options for having law enforcement staff located closer to the Rosita Flats ORV use area, which would assist in the protection of Arkansas River shiner habitat by enforcing compliance in order to preserve potentially sensitive shiner habitat.

Four to six times per week, on-the-ground NPS law enforcement would patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV violations. Monitoring for incidental take of the Arkansas River shiner would occur at this time. Law enforcement patrols may be added as funding from ORV permits becomes available under the various alternatives.

Similar to alternative B, the implementation of designated ORV access points at the riverbed, posting signs to prohibit driving in isolated pools, and prohibitions on parking or staging vehicles within the wetted river channel would help protect Arkansas River shiner habitat at Rosita Flats by limiting ORVs from driving through riparian habitat and localizing impacts; however, long-term moderate adverse impacts on the Arkansas River shiner would persist from the continued use of ORVs in the riverbed.

As described for alternative B, the national recreation area would monitor the shiner population every three to five years to ensure that additional management is not necessary. Additionally, when a visitor receives a permit, educational material would be provided, including the prohibition on driving in full pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These protection measures would help mitigate the adverse impacts of ORV use on the shiner. In addition, the NPS would provide sufficient guidance to its employees and contracted employees to minimize incidental take and to ensure compliance with the terms and conditions of the biological opinion (USFWS 2014).

Because alternative C would include ORV use limits, a fee-based permit system, designated ORV access points at the riverbed, and increased resource protection and law enforcement, the overall impact of alternative C on the Arkansas River shiner would be less than described for alternative A. However, unlimited ORV use would continue until use limits are determined, and ORVs would still be allowed in the riverbed. Therefore, the overall impact of alternative C would be expected to be short and long term, minor, and adverse.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have the potential for impacts under alternative C would be identical to those under alternative A, resulting in long-term moderate adverse impacts. These impacts, when combined with the short- and long-term minor adverse impacts under alternative C, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.

Conclusion

Short- and long-term moderate adverse effects on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the implementation of use limits, a fee-based permit system, the designation of ORV access points at the riverbed, and increased resource management, as well as other protection measures resulting from the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the Arkansas River shiner and its associated habitat. Therefore, the overall impacts of implementing alternative C would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.

IMPACTS OF ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

Under alternative D, the national recreation area would, in part, base the designation of routes and areas on a zoning system. One purpose of the zoning system would be to separate visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area but would not establish use limits.

As described under alternative A, the continued use of ORVs in the national recreation area would pose a threat to the Arkansas River shiner due to habitat disturbance, degraded water quality from soil erosion and sedimentation, disruption of the reproductive cycle, and/or direct mortality, resulting in short- and long-term moderate adverse impacts.

Similar to alternative B, implementing designated ORV access points at the riverbed, prohibitions on driving through isolated pools, prohibiting parking or staging in the wetted river channel, and resource protection zones under alternative D would contribute to the protection of Arkansas River shiner habitat at Rosita Flats by limiting ORVs from driving through riparian habitat and localizing impacts to certain areas. However, long-term moderate adverse impacts on the Arkansas River shiner would persist from the continued use of ORVs in the riverbed.

New resource protection rules and regulations would be established under alternative D, including increased law enforcement, which could result in short-term negligible to minor adverse impacts as described for alternative B. However, the overall impact of increased law enforcement at Rosita Flats would be long term and beneficial. Similar to alternative C, law enforcement would further be enhanced under alternative D by the use of aerial imagery every two to four years to track new user-created routes/noncompliance, helping ensure that ORV users are in compliance with rules and regulations in place to protect natural resources. Additionally, the option for having law enforcement staff located closer to the Rosita Flats ORV use area would be explored under alternative D. As stated for alternative C, this would assist in the protection of the Arkansas River shiner habitat by enforcing compliance in order to preserve potentially sensitive shiner habitat.

As described under alternative C, the fee-based permit system would ultimately exclude ORV riders who are caught repeatedly violating the resource protection rules. The fee-based permit system could help mitigate adverse impacts of ORV use on the Arkansas River shiner by educating ORV users about resource protection and reducing the likelihood of ORVs driving outside designated areas. Educational messages for the permit would include information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These materials could also contain the statement, “The U.S. Fish and Wildlife Service recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed.” Additional educational materials concerning Arkansas River shiner protection could be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of Arkansas River shiner conservation.

As described for alternative B, the national recreation area would monitor the shiner population every three to five years to ensure that additional management is not necessary. Additionally, when a visitor receives a permit, educational material would be provided that would include the prohibition on driving in full pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These protection measures would help mitigate the adverse impacts of ORV use on the shiner. In addition, the NPS would provide sufficient guidance to its employees and

contracted employees to minimize incidental take and to ensure compliance with the terms and conditions of the biological opinion (USFWS 2014).

Four to six times per week, on-the-ground NPS law enforcement would patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV violations. Monitoring for incidental take of the Arkansas River shiner would occur at this time. Law enforcement patrols may be added as funding from ORV permits becomes available under the various alternatives.

Because alternative D would include a zoning system, designated ORV access points at the riverbed, a fee-based permit system, and increased resource management and law enforcement, the overall impact of alternative D on the Arkansas River shiner at Rosita Flats would be less than described for alternative A. Unlimited ORV use would continue at Rosita Flats and ORVs would still be allowed in the riverbed but use limits would be implemented if needed for resource protection. Therefore, the overall impact of alternative D would be expected to be short and long term, minor and adverse.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that have the potential for impacts affecting the Rosita Flats ORV use area under alternative D would be identical to those described for alternative A, resulting in long-term moderate adverse impacts. These impacts, when combined with the short- and long-term minor to moderate adverse impacts of alternative D, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner at the Rosita Flats ORV use area.

Conclusion

Although the continued use of ORVs at Rosita Flats would result in short- and long-term moderate adverse impacts on the Arkansas River shiner in localized areas, impacts would be less than under alternative A due to increased resource management which would result in long-term beneficial impacts, but there would be long-term minor adverse impacts. The implementation of a zoning system and fee-based permit system as well as the resource protection measures that would be implemented as part of the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the shiner at Rosita Flats. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor to moderate adverse impacts under alternative D, would result in long-term minor to moderate adverse impacts on the Arkansas River shiner.

ARCHEOLOGICAL RESOURCES

GUIDING REGULATIONS AND POLICIES

Federal actions that have the potential to affect cultural resources are subject to a variety of laws. The National Historic Preservation Act (1966, as amended) is the principal legislative authority for managing cultural resources associated with NPS projects. Generally, Section 106 of the act requires all federal agencies to consider the effects of their actions on cultural resources listed on or determined eligible for listing in the National Register of Historic Places. Such resources are termed “historic properties.” Agreement on how to mitigate effects on historic properties is reached through consultation with the State Historic Preservation Officer; the Tribal Historic Preservation Officer, if applicable; and the Advisory Council on Historic Preservation, as necessary. In addition, federal agencies must minimize harm to historic properties that would be adversely affected by a federal undertaking. Section 110 of the act requires federal agencies to establish preservation programs for the identification, evaluation, and nomination of historic properties to the National Register of Historic Places.

The National Historic Preservation Act established the National Register of Historic Places, the official list of the nation's historic places worthy of preservation. Administered by the NPS, the National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. The criteria applied to evaluate properties are contained in 36 CFR 60.4. The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and either:

(a) Are associated with events that have made a significant contribution to the broad patterns of our history;

(b) Are associated with the lives of persons significant in our past;

(c) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) Have yielded or may be likely to yield, information important in prehistory or history.

Cultural resources that meet the eligibility criteria for listing in the National Register of Historic Places are considered "significant" resources and must be taken into consideration during the planning of federal projects.

Other important laws or executive orders designed to protect cultural resources include, but are not limited to the following:

- NPS Organic Act—to conserve the natural and historic objects within parks unimpaired for the enjoyment of future generations
- American Indian Religious Freedom Act—to protect and preserve for American Indians access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites
- Archeological Resources Protection Act—to secure, for the present and future benefit of the American people, the protection of archeological resources and sites that are on public lands and Indian Lands
- NEPA—to preserve important historic, cultural, and natural aspects of our national heritage
- Executive Order 11593, "Protection and Enhancement of the Cultural Environment)—to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation
- Executive Order 13007, "Indian Sacred Sites")—to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

Through the legislation and the executive orders listed above, the NPS is charged with the protection and management of cultural resources in its custody. This is further implemented through Director's Order 28: Cultural Resource Management, NPS *Management Policies 2006* (NPS 2006b), and the 2008 "Programmatic Agreement among the National Park Service (U.S. Department of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers for Compliance with Section 106 of the National Historic Preservation Act" (NPS 2008c). These documents charge NPS managers with avoiding, or minimizing to the greatest degree practicable, adverse

impacts on park resources and values. Although the NPS has the discretion to allow certain impacts in parks, that discretion is limited by the statutory requirement that park resources and values remain unimpaired, unless a specific law directly provides otherwise.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

The NPS categorizes cultural resources as archeological resources, cultural landscapes, historic structures, museum objects, and ethnographic resources. As noted in the "Scoping Process and Public Participation" section in the "Purpose of and Need for Action" chapter, only the topic of impacts on archeological resources has been retained for detailed analysis in this plan/EIS.

The descriptions of effects on cultural resources that are presented in this section are intended to comply with the requirements of NEPA.

CEQ regulations and the NPS Director's Order 12 call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (e.g., reducing the intensity of an impact from major to moderate or minor). Any resultant reduction in the intensity of an impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. Cultural resources are non-renewable resources, and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered.

Negligible: The impact would be at the lowest level of detection or barely measurable, with no perceptible consequences, either adverse or beneficial, to archeological resources.

Minor: The impact would affect an historic site or district or an archeological site with the potential to yield information important in prehistory or history. The historic context of the affected site(s) would be local.

Moderate: The impact would affect an archeological site with the potential to yield information important in prehistory or history. The historic context of the affected site would be statewide. For a National Register of Historic Places eligible or listed historic district, the impact would be readily apparent and/or change a character-defining feature(s) of the resource to the extent that its National Register of Historic Places eligibility would be jeopardized.

Major: The impact would affect an archeological site with the potential to yield important information about human history or prehistory. The historic context of the affected site would be national. The impact would be severe for eligible or listed historic districts. The impact would change a character-defining feature or features of the resource, diminishing the integrity of a National Register eligible or listed resource to the extent that it would no longer be eligible for or listed on the National Register of Historic Places.

Study Area

The study area for archeological resources is considered to be the boundaries of the ORV use areas in Blue Creek and Rosita Flats and adjacent lands outside the national recreation area boundary for cumulative impacts.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, ORV use would continue to be permitted throughout Blue Creek along the creek bottom from cutbank to cutbank and in Rosita Flats below the 3,000-foot elevation line. ORV and other motorized vehicle use would have impacts including soil disturbance, compaction, vegetation loss, and erosion, which in turn can lead to disturbance of surface and subsurface archeological sites. Impacts would result from the damage or destruction that occurs when motorized vehicles drive over and/or near archeological sites. The weight and torque of such vehicles easily damages fragile surface deposits and, consequently, surface and subsurface features (e.g., remains of houses, burials, hearths, storage pits, and other features), as well as breaking artifacts. Site integrity, a necessary element for listing a cultural resource in the National Register of Historic Places, is also affected by the visible changes caused by vehicle tracks and erosion (Sowl and Poetter 2004). According to the Bureau of Land Management, ORV use leads to an increase in visitation to previously inaccessible lands and increases the intentional and inadvertent damage of archeological resources through surface disturbances (Bureau of Land Management 2000). Impacts could also occur because soil erosion caused by ORVs exposes artifacts, making them susceptible to unauthorized collection (Sowl and Poetter 2004).

Blue Creek ORV Use Area

Known archeological sites in the Blue Creek area include village or hamlet sites and one possible multiple human burial site, all of which are sensitive to damage caused by ORVs driving over sites and eroding soil. Villages and hamlets include stone foundations and architectural remains along with other portable cultural items and artifact scatters. There is also the potential for unknown, subsurface sites in this area that could be subject to erosion and damage due to ORV use. Although ORV use is permitted at Blue Creek only along the creek bottom from cutbank to cutbank, there is evidence that some riders stray outside the permitted use area and cause erosion on terraces above the creek where archeological sites exist.

Rosita Flats ORV Use Area

Known archeological sites in the Rosita Flats area include a village site, campsites, open sites, and one cave habitation site, mostly on ridges above the river. There is also the potential for unknown, subsurface sites in this area that could be subject to erosion and damage due to ORV use. Although ORV use is permitted only below the 3,000-foot elevation line, there is evidence that some riders stray outside the permitted use area and cause erosion on terraces and ridges above the river where archeological sites exist.

Alternative A would result in continued potential impacts on various archeological resources along or near open routes or access. Alternative A would have long-term major adverse impacts on archeological resources because ORV use as currently regulated would continue and would have the potential to impact archeological sites.

Cumulative Impacts

Past impacts on archeological resources have been caused by other development inside and outside the national recreation area, including the construction and maintenance of oil and gas wells. However, the Rosita Flats and Blue Creek areas have not been heavily developed for oil and gas extraction.

Lake Meredith National Recreation Area Master Plan (NPS 1973) states that staff should be continually aware of the presence of prehistoric and historic sites so that maintenance and construction will not

destroy sites the NPS is charged with preserving. The plan also states that once research and survey of national recreation area lands for cultural resources is complete, management of those resources will evolve.

The current Fire Management Plan (NPS 1998b) states that areas of proposed prescribed burns will be subject to inventory for cultural resources, which would be a beneficial impact for archeological resources because it would allow for the avoidance of those sites. It also states that known archeological sites will be protected as much as possible during wildland fire fighting. The most likely adverse impact on archeological sites would occur during the use of heavy equipment to fight fires.

There has been recreational ORV use in the Lake Meredith area since its establishment as a recreation area in the 1970s. The implementation of Executive Order 11644 allows for ORV use on public lands; however, the Resources Management Plan (NPS 1996) states that several archeological sites have been damaged within and outside the ORV use areas. The plan lists protection of cultural resources as one of the national recreation area's goals and objectives without listing specific actions.

ORV use also occurs on adjacent private lands. While most of the vehicular use inside the national recreation area is by typical street-legal cars and trucks, much of the vehicular use on adjacent lands involves the use of ORVs such as ATVs, jeeps, or other high-clearance vehicles. The use of vehicles off formal roads has the potential to cause adverse impacts on archeological resources similar to those described previously, and as a result, related impacts are expected to continue.

It is expected that the implementation of the forthcoming GMP will mandate resource protection zones, especially those that limit motorized vehicle access, which will also help protect archeological resources.

Despite some beneficial actions, overall impacts from other past, present, and reasonably foreseeable future actions on archeological resources would be long term, minor to moderate, and adverse (impacts would be noticeable to readily apparent, and would affect some resources over a relatively large area). In combination with the long-term major adverse impacts of alternative A, overall cumulative impacts would be long term, major, and adverse.

Conclusion

Alternative A would result in continued potential long-term major adverse impacts on archeological resources along or near open ORV use areas, routes, or access points. Cumulative impacts would be long term, major, and adverse.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B, ORVs would only be allowed on sandy bottom areas and designated routes at Blue Creek, with ORV use prohibited on vegetated areas. At Rosita Flats, the area south of the river and east of Bull Taco Hill (both currently denuded of vegetation) would be established as ORV use areas and would be open to ORV use. Access to the riverbed from ORV use areas would be from designated access points only. Outside ORV use areas, ORV use would be permitted only on designated, marked routes.

Alternative B would also institute a zoning system that would be a "layer" on top of these routes and areas that would further manage use. A resource protection zone would be established to protect vegetation and reduce soil erosion east of Bull Taco Hill at Rosita Flats. In this zone, only ORVs with a wheel width less than 64 inches would be permitted.

Alternative B would also include increased coordination with the State of Texas if a new state park adjacent to Rosita Flats is established. This effort would include coordinating the resources of the NPS and the state in this area, particularly law enforcement and interpretive resources. Within the recreation area, archeological resources in ORV routes or areas would be protected either with barriers or other methods of restricting access, including establishing routes that bypass these areas. Should additional resources be discovered within ORV routes or areas, the resources would be protected from ORV use.

Blue Creek ORV Use Area

As with alternative A, impacts on known and unknown archeological sites in the Blue Creek area could occur due to ORV use under alternative B. Although ORV use would be permitted at Blue Creek only along the creek bottom and designated routes and non-vegetated areas, there is current evidence that some riders stray outside the permitted use area and cause erosion on terraces above the creek where archeological sites exist. However, these occurrences should be reduced under alternative B because ORV permit holders may have their permits revoked if they enter closed areas. In addition, measures would be taken to restrict access to areas where resources are located within an ORV route.

Rosita Flats ORV Use Area

Under alternative B, the denuded area south of the river and the area east of Bull Taco Hill would be subject to impacts similar to those described under alternative A; additional protection measures would be implemented for known resource areas. Archeological resources in the ORV use area and along designated, marked routes would be protected through a variety of management measures and further impacts to these sites would be limited. An education program to make users aware of the potential impacts on cultural resources caused by ORVs, as well as the ability to recommend revocation of ORV permits, would benefit archeological sites by encouraging users to stay within designated use areas. If a new state park adjacent to Rosita Flats is established, coordination with the State of Texas could result in either negligible or beneficial impacts on archeological resources, depending on the level of enforcement of ORV use between the federal and state agencies.

Alternative B would have long-term minor adverse impacts on archeological resources because resources do exist in the ORV use areas, but would be protected though limited site access in known resource areas.

Cumulative Impacts

The effects of other past, present, and reasonably foreseeable future actions on archeological resources would be the same as described for alternative A: long term, minor to moderate, and adverse. Overall, the impacts of these actions, when combined with the long-term minor to moderate adverse impacts of alternative B, would result in long-term minor to moderate adverse cumulative impacts on archeological resources.

Conclusion

Alternative B would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Measures would be implemented to restrict access to the sensitive areas. Cumulative impacts would be long term, minor to moderate, and adverse.

IMPACTS OF ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Under alternative C, the national recreation area would manage ORV use through a permit system, as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except a second ORV use area east of Bull Taco Hill would not be established.

Education and outreach efforts at Blue Creek and Rosita Flats would be the same as those under alternative B, in addition to post-and-cable fences and signs around the ORV use boundary at Rosita Flats to better define allowable ORV use in this area. This alternative could also include the installation of an interpretive wayside exhibit program at Blue Creek, as funding from the permit fees allows.

Within the recreation area, archeological resources in ORV routes or areas would be protected either with barriers or other methods of restricting access, including establishing routes that bypass these areas. Should additional resources be discovered within ORV routes or areas, the resources would be protected from ORV use.

Blue Creek ORV Use Area

As with alternatives A and B, impacts on known and unknown archeological sites in the Blue Creek area could occur due to ORV use under alternative C, but would be mitigated restricting access in areas where archeological resources are present along ORV routes or areas. Although ORV use would be permitted at Blue Creek only along the creek bottom, designated routes, and non-vegetated areas, there is current evidence that some riders stray outside the permitted use area and cause erosion on terraces above the creek where archeological sites exist. An education program to make users aware of the potential impacts on cultural resources caused by ORVs would benefit archeological sites through encouraging ORV users to observe designated use areas. Similarly, a wayside interpretive program could be used to educate and inform the public on the importance of observing designated use areas to protect sensitive cultural resources. The permit system would have no initial limits on the number issued, which would keep usage levels near current levels. The ability to recommend the revocation of permits under alternative C for violation of ORV regulations would be beneficial and would increase compliance; therefore, the ORV use and resulting potential impacts would remain the same as under alternative A, with some benefits from the recommendation to revoke ORV permits, at Blue Creek unless it exceeds the user capacity.

Rosita Flats ORV Use Area

Under alternative C, the denuded area south of the river would be subject to similar impacts as under alternative A, but potential impacts to archeological sites would be mitigated by restricting access in areas where archeological resources are present along ORV routes or areas. Archeological resources in the ORV use area and along designated, marked routes could be directly or indirectly impacted by ORVs riding over sites resulting in erosion at higher elevations above the river but access restrictions in these resource areas would mitigate the potential impacts. An education program to make users aware of the potential impacts on cultural resources caused by ORVs would benefit archeological sites by encouraging users to stay within designated use areas. Post-and-cable fences and signs around the ORV use boundary at Rosita Flats would have a beneficial impact on archeological sites because they would restrict users from riding at the higher elevations where sites exist. The permit system would have no initial limits on the number issued, which would keep usage levels near current levels. The ability to recommend the revocation of permits under alternative C for violation of ORV regulations as well as the potential for user limits would be beneficial and would increase compliance; therefore, the ORV use and resulting potential

impacts would remain the same as under alternative A, with some additional benefits from the ability to recommend the revocation of ORV permits, at Rosita Flats.

Alternative C would have long-term minor adverse impacts on archeological resources. Where sites do exist, they would be protected with access restrictions.

Cumulative Impacts

The effects of other past, present, and reasonably foreseeable future actions on archeological resources would be as described for alternative A: long-term, minor to moderate, and adverse. Overall, the impacts of these actions, when combined with the long-term minor to moderate adverse impacts of alternative C, would result in long-term minor to moderate adverse cumulative impacts on archeological resources.

Conclusion

Alternative C would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points; where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.

Impacts of Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas

Under alternative D, the national recreation area would manage ORV use through both a zone system (such as in alternative B) and a permit system (as described in alternative C). Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B.

Education and outreach efforts at Blue Creek and Rosita Flats would be the same as those under alternative B, in addition to post-and-cable fences and signs around the ORV use boundary at Rosita Flats to better define allowable ORV use in this area. This alternative could also include the installation of an interpretive wayside exhibit program at Blue Creek, as funding from the permit fees allow.

Within the recreation area, archeological resources in ORV routes or areas would be protected either with barriers or other methods of restricting access, including establishing routes that bypass these areas. Should additional resources be discovered within ORV routes or areas, the resources would be protected from ORV use.

Alternative D has been identified as the NPS preferred alternative. On July 1, 2014, the NPS sent a letter to the Texas Historical Preservation Officer requesting concurrence that there would be no adverse impacts to historic properties from implementation of the proposed action. The Texas Historical Preservation Officer provided concurrence on July 23, 2014.

Blue Creek ORV Use Area

As with all alternatives, impacts on known and unknown archeological sites in the Blue Creek area could occur due to ORV use under alternative D; however these impacts would be mitigated through the use of access restrictions in areas with these known resources. Although ORV use would be permitted at Blue Creek only along the creek bottom and designated routes and non-vegetated areas, there is current evidence that some riders stray outside the permitted use area and cause erosion on terraces above the creek where archeological sites exist. An education program to make users aware of the potential impacts on cultural resources caused by ORVs would benefit archeological sites through encouraging ORV users

to observe designated use areas. Similarly, a wayside interpretive program could be used to educate and inform the public on the importance of observing designated use areas to protect sensitive cultural resources. The permit system would have no initial limits on the number issued, which would keep usage levels near current levels. The recommendation to revoke permits under alternative D for violation of ORV regulations would be beneficial and would increase compliance; therefore, the ORV use and resulting potential impacts would remain the same as under alternative A, with some benefits from the ORV permits, at Blue Creek.

Rosita Flats ORV Use Area

Under alternative D, the denuded area south of the river would be subject to the same impacts as under alternative B, as well as the additional ORV use area near Bull Taco Hill. Archeological resources in the ORV use area and along designated, marked routes could be impacted by ORVs riding over sites and the potential for increased erosion at higher elevations above the river, but known sites would be avoided to the greatest extent possible. If sites are located in these areas, access restrictions would be put in place to mitigate potential impacts. An education program to make users aware of the potential impacts on cultural resources caused by ORVs would benefit archeological sites by encouraging users to stay within designated use areas. Post-and-cable fences and signs around the ORV use boundary at Rosita Flats would have a beneficial impact on archeological sites because they would restrict users from riding at the higher elevations where sites exist. The permit system would have no initial limits on the number issued, which would keep usage levels near current levels. The ability to recommend the revocation of permits under alternative D for violation of ORV regulations would be beneficial and would increase compliance; therefore, the ORV use and resulting potential impacts would remain the same as under alternative A, with some additional benefits from the recommendation to revoke ORV permits at Rosita Flats. In the designated resource protection zone, long-term beneficial impacts would occur due to a reduction in ORV disturbance.

Alternative D would result in continued potential impacts on various archeological resources along or near open ORV routes or access points; however, access restrictions would minimize these impacts. Alternative D would have long-term minor adverse impacts on archeological resources.

Cumulative Impacts

The effects of other past, present, and reasonably foreseeable future actions on archeological resources would be as described for alternative A: long-term, minor to moderate, and adverse. Overall, the impacts of these actions, when combined with the long-term minor to moderate adverse impacts of alternative D, would result in long-term minor to moderate adverse cumulative impacts on archeological resources.

Conclusion

Alternative D would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.

VISITOR USE AND EXPERIENCE / HEALTH AND SAFETY

GUIDING REGULATIONS AND POLICIES

NPS *Management Policies 2006* (NPS 2006b, Section 8.2) states that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and the NPS is

committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. Because many forms of recreation can take place outside a national park setting, the NPS will therefore seek to

- Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks
- Defer to local, state, and other federal agencies; private industry; and non-governmental organizations to meet the broader spectrum of recreational needs and demands.

To provide for enjoyment of the parks, the NPS will encourage visitor activities that

- Are appropriate to the purpose for which the park was established
- Are inspirational, educational, or healthful, and otherwise appropriate to the park environment
- Will foster an understanding of and appreciation for park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources
- Can be sustained without causing unacceptable impacts on park resources or values.

Part of the purpose of Lake Meredith National Recreation Area is to offer diverse, affordable outdoor land- and water-based recreational activities. Its significance lies in the spectacular and diverse scenic, recreational, and cultural resources that visitors enjoy.

CEQ regulations (40 CFR 1508.27) require the NPS to consider the effects of proposed actions on visitor health and safety. The NPS recognizes that both the park resources that attract visitors and some of the specific recreational activities in which visitors participate can present sources of potential hazards. The NPS *Management Policies 2006* states that, "While recognizing that there are limitations on its capability to totally eliminate all hazards, the Service … will seek to provide a safe and healthful environment for visitors and employees." The NPS *Management Policies 2006* also states that "the Service will reduce or remove known hazards and apply other appropriate measures, including closures, guarding, signing, or other forms of education" (NPS 2006b, Section 8.2.5.1). Although the NPS strives to provide a safe and healthful environment for park visitors, park visitors must be aware of risks and assume a substantial degree of responsibility for their own safety when visiting and recreating in park areas. NPS *Management Policies 2006* does not impose park-specific visitor safety prescriptions. Rather, the means by which public safety concerns might be addressed are left to the discretion of the area manager (NPS 2006b, Section 8.2.5.1).

Because ORV use presents a visitor health and safety concern, some alternatives include new requirements for ORVs.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

The purpose of this impact analysis is to evaluate the potential for change in visitor use and experience / health and safety by identifying projected increases or decreases in both motorized vehicle use and other visitor uses, and determining whether these projected changes would affect the desired visitor experience.

Negligible: Visitors would likely be unaware of impacts associated with proposed changes. There would be no noticeable change in visitor experience or public health and safety.

Minor: Changes in visitor experience would be slight and detectable, but would not appreciably limit or enhance any critical characteristics of the visitor experience. Other areas of the national recreation area would remain available for similar visitor experience and use without degradation of national recreation area resources and values. The impact on visitor safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors at localized areas. There would not be an appreciable effect on public health and safety.

Moderate: Changes in visitor experience would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes. Other areas of the national recreation area would remain available for similar visitor experience and use without degradation of national recreation area resources and values, but visitor satisfaction might be measurably affected (visitors could be either satisfied or dissatisfied). The impact on visitor safety would be readily apparent and would result in substantial, noticeable effects on public health and safety on a local scale.

Major: Impacts on visitor experience would be readily apparent and would have substantial consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes. The change in visitor use and experience proposed would prevent some visitors from enjoying national recreation area resources and values. Some visitors who desire to continue their use and enjoyment of the activity / visitor experience would be required to pursue their choice in other available local or regional areas. The impact on visitor safety would be readily apparent and would result in substantial, noticeable effects on public health and safety on a regional scale.

Duration: Short-term impacts would occur sporadically throughout a year, but would generally last no more than three weeks per year.

Long-term impacts would occur more than three weeks per year and likely for consecutive years.

Study Area

The geographic study area for the visitor use and experience / health and safety analysis, including the cumulative impacts analysis, includes the entire area within the national recreation area boundary.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, the management of ORV use and access at the national recreation area would continue current management strategies based on the 2007 *Interim OHV Use Plan* (NPS 2007a), the regulations contained in 36 CFR 7.57, and the Superintendent's Compendium. ORV use would continue to be permitted throughout Rosita Flats below the 3,000-foot elevation line and at Blue Creek along the creek bottom from cutbank to cutbank. No additional management tools such as zoning, permits, or use limits would be implemented.

Under alternative A, ORV education would occur through visitor contact with rangers, maintenance staff, and other park staff, as well as through on-site learning opportunities. Visitors would be given trash bags to use during busy weekends. The use of trash bags by visitors would potentially keep the national recreation area cleaner and more enjoyable for users, resulting in beneficial impacts on visitor use and experience / health and safety.

Visitors would be permitted to camp throughout Rosita Flats and Blue Creek under alternative A, with no specific areas or sites designated for camping. Campfires would be regulated under the Superintendent's Compendium. If the fire danger is high, the national recreation area would prohibit campfires, resulting in short-term benefits to visitor health and safety. Amenities at Blue Creek currently include picnic tables, trash receptacles, and pit toilets. Currently at Rosita Flats, picnic tables and trash receptacles are available for visitor use. These amenities would continue to be offered at the two ORV use areas as funding permits. The continued provision of amenities would have long-term beneficial impacts for national recreation area users. However, if funding for these amenities becomes limited the NPS may no longer be able to provide these services and short- and long-term minor adverse impacts could result.

Law enforcement would continue to patrol Blue Creek and Rosita Flats, with more frequent patrols at Blue Creek due to the remote location of Rosita Flats. According to an ASU 2004 visitor study (ASU 2004), ORV users voiced concerns that national recreation area amenities are often destroyed and that use areas are dangerous and not conducive to families. Because no changes to current ORV management and law enforcement would occur under alternative A, long-term minor to moderate adverse impacts on visitor use and experience / health and safety could result if visitors do not feel safe at ORV use areas in the national recreation area.

Under alternative A there would be no change to current visitor use and experience or to access or recreational opportunities. Although some ORV users would benefit from limited regulation and no access restrictions under alternative A, these conditions would adversely affect other users in the national recreation area who perceive a conflict with other uses or are impacted by the noise from ORVs. As a result, impacts of alternative A on visitor use and experience / health and safety would be long term, moderate, and adverse.

Cumulative Impacts

Past, present, and reasonably foreseeable actions that could impact visitor use and experience include those recreational opportunities available in the national recreation area as well as those throughout the Amarillo region. In the national recreation area, the level of Lake Meredith has been decreasing, in part due to water pumping, which has resulted in a decrease in the opportunities for water-based recreation. To address these changes the national recreation area has been planning for other forms of recreation for visitors to enjoy. One of these activity changes is the introduction of a multi-use trail. Visitors would be able to use the trail for pedestrian and bicycle use. Another recreational opportunity currently available is hunting. The current effort for the development and implementation of a GMP would also anticipate the changing availability of recreational opportunities in the national recreation area. In addition to opportunities in the national recreation area, the state of Texas manages the Texas Off-Highway Vehicle Program, which provides for ORV use on state lands. The Sand Drags event also provides an annual recreation event for ORV users in the area. The provision of additional opportunities for recreation inside and outside the national recreation area would have long-term beneficial impacts on visitor use and experience due to the range of activities available, many of them related to ORV use. Although there would be beneficial impacts from additional recreational opportunities, during public scoping for the plan/EIS commenters thought there was a lack of public lands for recreational use, as well as an increasing demand for the available lands. The perception of a lack of opportunities could have long-term moderate adverse impacts if any of the opportunities in the area are reduced. Additionally, expanding

recreational opportunities could result in short- and long-term negligible to moderate adverse impacts on visitor health and safety, depending on the activity.

The state of Texas requires all OHV users to purchase and display a decal prior to operating the vehicle on public lands, including the national recreation area. Failure to obtain this decal constitutes a Class C misdemeanor and could result in the OHV operator being issued a citation. Fines for this offense range from $25 to $500. In addition to OHV decal fees, ORV users in Lake Meredith who are boating also are required to obtain a permit for that use, and later, the national recreation area could implement user fees for other areas. If national recreation area users are required to pay fees for multiple recreational activities, inside and outside the national recreation area, these fees could result in minor to moderate adverse impacts on visitor use and experience.

Past and ongoing planning efforts also influence visitor use and experience in the national recreation area, including the Resources Management Plan, Fire Management Plan, Oil and Gas Management Plan, the Lake Meredith National Recreation Area Master Plan, and visitor use studies. These planning efforts take into account visitor use and safety and the preservation of recreational opportunities in the national recreation area, resulting in long-term beneficial impacts. Implementation of these plans could result in long-term minor adverse impacts because some of these management actions, such as fire management, may temporarily make some of the national recreation area lands inaccessible to visitors while management actions are in progress. Maintenance operations in the national recreation area would result in long-term beneficial impacts because all areas of the unit would be maintained, including trash removal. The requirements of maintenance around the ORV use areas has increased due to the removal of trash cans from state property, resulting in visitors using trash disposal facilities in the national recreation area and increasing the demands on maintenance. These extra demands on national recreation area staff could result in long-term negligible to minor adverse impacts when the national recreation area cannot keep up with this demand.

Overall, these actions would have long-term minor adverse impacts on visitor use and experience / health and safety. These impacts, when combined with the long-term moderate adverse impacts of alternative A, would result in long-term minor to moderate adverse cumulative impacts.

Conclusion

Under alternative A there would be no change to the current visitor use and experience, access, or recreational opportunities. The current safety risk of unregulated ORV use in the national recreation area would remain the same. As a result, impacts on visitor use and experience / health and safety would be long term, moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the long-term moderate adverse impacts under alternative A, would result in long-term minor to moderate adverse cumulative impacts on visitor use and experience / health and safety.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system. One purpose of these zones would be the separation of visitor uses that have the potential to conflict with one another. Established zones could include camping -only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones. At Blue Creek, ORVs would only be allowed on sandy bottom areas and designated routes, with ORV use prohibited on vegetated areas. ORV use would be permitted at Rosita Flats in the areas south of the river (currently denuded of vegetation) and to the east of Bull Taco Hill. Other ORV use (outside the areas described above) would

be allowed only on designated, marked routes. ORVs could only access the riverbed area from marked and designated access points off designated ORV routes. Driving on vegetation would be strictly prohibited.

A camping -only zone with a 15 mph speed limit would also be established. This zone would allow vehicular access but ORV use would not be permitted, which could result in minor adverse impacts on visitor use and experience by limiting ORV access. Prohibiting ORV use in the zone would likely be overall beneficial for visitors, because the associated noise and safety risks of ORV use would not be a concern for campers. These areas would contain picnic tables and fire pits as funding allows. No additional amenities would be provided beyond what is described under alternative A. The use of the camping zone would have long-term minor adverse and beneficial impacts on visitor use and experience, as well as long-term beneficial impacts on visitor safety.

Park visitors would be able to hunt in the designated hunting zone with ORVs, but recreational ORV use would not be allowed in these areas. Restriction in the hunting zone would last from two to eight weeks (up to two months), resulting in long-term moderate adverse impacts on visitor use and experience for non-hunters from limiting ORV access in this zone. However, restricting ORV use in the hunting zone would benefit visitor health and safety by keeping non-hunters safe from hunting activities. The use of ORVs in the hunting zone by hunters only would benefit visitor use and experience for hunters, because a lower number of ORVs would be affecting wildlife, thus making hunting more favorable. The use of ORVs by hunters could result in long-term negligible to minor adverse impacts because the potential for user conflicts may arise with hunters not using ORVs. According to the ASU 2004 visitor survey, most user-group conflicts related to ORV use tend to be with other user groups perceiving conflicts with ORV users, although ORV users generally do not recognize these conflicts (ASU 2004). Overall, the creation of a hunting zone would result in long-term minor to moderate adverse impacts as well as beneficial impacts on visitor use and experience / health and safety.

ORV users new to “off-roading” would be able to enjoy a beginner loop zone at Rosita Flats. This beginner zone would require riders to keep their speeds below 20 mph. At Blue Creek a new low-speed zone for family use would be implemented on either side of the FM 1913 bridge. The beginner loop zone and low-speed family zone would likely attract users that would otherwise visit other ORV use areas. The implementation of the proposed zones would be beneficial to visitor use and experience / health and safety, especially if the riders are new to the sport. A zone that requires low speeds could aid riders in feeling more comfortable learning without feeling intimidated by more skilled riders using faster speeds. Riders would be restricted to speeds no greater than 15 mph within sight of the bridge (about half a mile in either direction). This low-speed zone would allow families to play in the water without the associated safety risks of ORV use at excessive speeds. Therefore, the beginner zone would have long-term beneficial impacts on visitor use and experience / health and safety.

A resource protection zone would be designated at Rosita Flats north of the beginner and camping zones and east of the ORV use area around Bull Taco Hill where only vehicles with a wheel width less than 64 inches would be permitted (for example, most ATVs, UTVs, and motorcycles) would be permitted. Park officials would delineate the boundary of use zones using signs, caronsite posts, or post -and -cable fencing to better define the user zones. The resource protection zone would create beneficial impacts for visitors, because this zone would help to keep resources in a state where they can be enjoyed by users in the future. However, designating a resource zone at Rosita Flats could also lead to long-term negligible to minor adverse impacts on visitor use and experience by limiting ORV use in the area.

The establishment of zones would, for the most part, result in long-term beneficial impacts because it would provide for a separation of uses and reduce perceived user conflicts. However, as previously described, designating zones (e.g., hunting and resource protection) within the national recreation area

could result in long-term minor to moderate adverse impacts on visitor use and experience by limiting ORV use and preventing some visitors from enjoying certain resources and areas they find important.

Under alternative B, a no-cost permit would be required to operate ORVs in Blue Creek and Rosita Flats. The permit would provide visitors with ORV regulations and information. Permits would be obtained online, at the visitor center, at local shops, or from rangers in the field. The operator would need to sign the permit and keep it with the vehicle, and the permit could be revoked at any time for violation of ORV regulations. Implementing a permit system could have short-term moderate adverse impacts on visitor use and experience, because some visitors may consider the process of obtaining a permit inconvenient. However, long-term beneficial impacts would also result, because it is expected that greater compliance with ORV regulations would lead to an improved visitor experience.

Under alternative B, the establishment of zones and the implementation of a permit system would have beneficial impacts for some visitors by providing a separation of uses, reducing noise impacts in certain areas, improving the safety of ORV use at the national recreation area, and enhancing resource conditions. However, for a minority of visitors, limiting access at Rosita Flats for part or all of the year would result in long-term moderate adverse impacts. The overall impacts of alternative B on visitor use and experience / health and safety would be long term, minor to moderate, and adverse as well as long term and beneficial.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that would impact visitor use and experience / health and safety under alternative B would be the same as those under alternative A, and impacts would be long term, minor, and adverse. These impacts, when combined with the minor to moderate adverse and long-term beneficial impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts.

Conclusion

Although the establishment of zones and the implementation of a permit system would have adverse impacts for the majority of visitors by requiring visitors to obtain an ORV permit, beneficial impacts would result from the separation of visitor uses, improved safety, and enhanced resource conditions at the national recreation area. A minority of users would experience moderate adverse effects by loss of access to the resource protection zone and temporary loss of the hunting zone in Rosita Flats. Some users could experience long-term negligible to minor adverse impacts because the potential for user conflicts may arise with hunters not using ORVs in the hunting zone. Overall, impacts under alternative B would be long term, minor to moderate, and adverse as well as long term and beneficial for ORV users at the national recreation area. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.

Impacts of Alternative C: Management through Use of a Permit System at Current ORV Use Areas

Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits. Permits would include a fee, and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except there would be one designated ORV use area in Rosita Flats, instead of two.

Under alternative C, the permit (used for both ORV use areas) would be inexpensive and the fee structure would be similar to other permit fee structures that currently exist in the national recreation area. These permits would be available for purchase through the mail, at park headquarters, online, or at other vendors. A kiosk and “Iron Ranger” could also be used to supply daily permits. These permits would be in sticker form so users would place the permit on the bumper of the vehicle, and permits could be revoked for violation of the ORV regulations. The implementation of a fee-based permit system would result in long-term minor adverse impacts on visitor use and experience from any inconvenience associated with obtaining a permit. However, the fees received from these permits would help create and maintain visitor amenities in the ORV use areas, resulting in overall beneficial impacts on visitor use and experience by enhancing amenities that would not otherwise be available. Additionally, a permit system would help ensure compliance with recreation rules and regulations, resulting in long-term benefits to visitor use and experience / health and safety. Overall, users would be aware of the changes associated with requiring ORV use permits, but these changes would be slight and Rosita Flats and Blue Creek would still be open to ORV use to provide for this experience.

Use limits under alternative C could be developed based on indicators and standards developed through the planning process for the GMP. Criteria would be developed and monitored to determine when resources are being impacted and use limits need to be developed. A monitoring plan would be developed to help describe these studies and how implementation would be achieved. Use limits would help mitigate the adverse impacts of ORV use on national recreation area resources, thus benefiting visitor use and experience. However, long-term minor adverse impacts could result for some ORV users from limited/restricted access.

ORV use would not be allowed between 10:00 p.m. and 6:00 a.m., and headlights would be required for all ORVs after dark. This would benefit visitor safety by reducing the risk of collisions because ORVs would be more noticeable. Equipment requirements would be the same as described for alternative A, with the addition that all ATVs would be required to have a triangular orange flag on top of an 8-foot pole attached to the back of the ORV. The addition of the orange flag would aid users and non-users to more easily identify ORVs, which may be difficult to see due to the terrain. Riders would be required to adhere to the same speed limits as under alternative A, as well as a recommended speed limit of 25 mph on ORV routes and 55 mph on sand bottom flats. The speed limits may affect the experience of some visitors; however, the speed limits would be beneficial to the safety of users and non-users by reducing the likelihood of collisions.

Under alternative C, the national recreation area would provide the same education and outreach as described for alternative B. In addition, an interpretive wayside program would be implemented at Blue Creek that would be funded by the fee permit program. The interpretive wayside program and other education and outreach under alternative C would result in long-term beneficial impacts because recreational users would be more aware of ORV regulations providing for an improved visitor experience.

Camping under alternative C would be allowed in designated camping sites for tent and vehicle camping, as under alternative B. A lower speed limit would be enforced in the area where the camping sites are located and recommended speed limits would be provided in Rosita Flats and Blue Creek. Fire pits and designated campsites would be provided using funds from the permit system. Outside designated camping areas at Rosita Flats, tent camping would be permitted only in areas with no vegetation or on previously disturbed vegetation. Visitors would be required to walk to their campsites in these tent camping areas because vehicles would be required to be parked off the vegetation along designated ORV routes or areas. Pit toilets, fire rings, and picnic tables in designated camping areas would be provided on a phased-in basis. Other amenities that may be added, based on funding, include shade shelters, emergency call stations, and additional kiosks and bulletin boards for visitor information, all resulting in long-term

beneficial impacts on visitor use and experience / health and safety. Law enforcement levels would be increased and additional law enforcement resources would be provided from permit fee funds.

The proposed permit fee, while being an additional cost to visitors, would create more visitor amenities that would enhance visitor use and experience at the national recreation area. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease. Visitor health and safety would further benefit from additional ORV requirements (e.g., headlights, speed limits, and orange flags for ATVs), because they would aid in visibility for non-users and users alike. As a result, impacts on visitor use and experience / health and safety under alternative C would be long term, minor, and adverse, because users would need to adjust to a user fee, as well as long term and beneficial from enhanced safety and additional amenities.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that would impact visitor use and experience / health and safety under alternative C would be the same as those under alternative A, and impacts would be long term, minor, and adverse. These impacts, when combined with the long-term minor adverse and long-term beneficial impacts of alternative C, would result in long-term minor adverse and long-term beneficial cumulative impacts.

Conclusion

The proposed permit fee, while being an additional cost to visitors, would create more visitor amenities that would enhance visitor use and experience at the national recreation area. Additionally, a greater presence of law enforcement, as well as the rangers' ability to revoke ORV permits, may cause visitor violations and illegal activity to decrease. As a result, impacts under alternative C would be long term, minor, and adverse, because users would need to adjust to a user fee, as well as long term and beneficial from enhanced safety and additional amenities, ORV rules, and education. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.

Impacts of Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas

Under alternative D the national recreation area would, in part, base the designation of routes and areas on a zoning system. One purpose of the zones would be the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee -permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area, but no use limits would be established.

As described for alternative B, the implementation of a zoning system would have long-term beneficial effects by providing for a separation of uses and reducing user conflicts. However, some of the zones, such as the hunting zone that could limit ORV use for up to two months out of the year, or the resource protection zone east of Bull Taco Hill that would restrict the use of ORVs with a wheel width greater than 64 inches, would restrict ORV use in large areas of Rosita Flats. These restrictions would likely have long-term moderate adverse impacts on visitor use and experience because visitors would be highly aware of the effects associated with zoning, and some visitors may be prevented from enjoying park resources they find important. However, restricting ORV use in the hunting zone would benefit visitor health and safety by keeping non-hunters safe from hunting activities. The use of ORVs by hunters could result in long-term negligible to minor adverse impacts because the potential for user conflicts may arise with

hunters not using ORVs. Overall, the creation of a hunting zone would result in long-term minor to moderate adverse impacts as well as beneficial impacts on visitor use and experience / health and safety.

Prohibiting ORV use in the camping zone would likely be overall beneficial for visitors, because the associated noise and safety risks of ORV use would not be a concern for campers. The use of the camping zone would have long-term minor adverse impacts and beneficial impacts on visitor use and experience, as well as long-term beneficial impacts on visitor safety. As described for alternative B, a beginner zone would be established at Rosita Flats under alternative D, resulting in long-term beneficial impacts on visitor use and experience / health and safety. Having a zone that requires low speeds could aid riders in feeling more comfortable learning without feeling intimidated by more skilled riders operating at faster speeds.

At Rosita Flats, the road leading to the designated camping area would be improved, but not paved, to assist in the evacuation of visitors during rainstorms when the area becomes muddy. The improved road would be beneficial to visitors and their safety in the event of a storm.

Alternative D would require ORVs entering the national recreation area (including vehicles transported to the national recreation area on a trailer) to have a permit, as described for alternative C. This permit would be inexpensive and the fee structure would be similar to other permit fee structures that currently exist in Lake Meredith, and would be determined outside of this plan/EIS. The permit could lead to long-term minor adverse impacts because users would be aware of the changes and would be required to pay a minimal fee.

The proposed permit fee, while being an additional cost to visitors, would fund more visitor amenities that would enhance their visits to the national recreation area. The money received from the fees would be used to provide potential additional amenities at Rosita Flats and Blue Creek, including pit toilets, fire rings, and picnic tables. Amenities would be provided on a phased-in basis, based on the level of use the added amenities receive, which would be an indication of demand for additional amenities. Depending on funding and demand, other potential amenities could include shade shelters, emergency call stations, and additional information kiosks or bulletin boards. These improvements and amenities would provide long-term beneficial effects for visitor use and experience. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease. As a result, impacts on visitor use and experience / health and safety under alternative D would be short term, minor, and adverse, because users would need to adjust to a user fee, but long term and beneficial from the additional amenities, provided education, and reduced illegal activities.

As described for alternative C, operation of ORVs would not be allowed between 10:00 p.m. and 6:00 a.m. and headlights would be required for all ORVs after dark, resulting in long-term benefits to visitor safety by reducing the risk of vehicle collisions. Also similar to alternative C, ATVs would be required to have a triangular orange flag on top of an 8-foot pole attached to the back of the ORV, allowing both users and non-users to more easily identify ORVs which may be difficult to see due to the terrain. Riders would be required to adhere to the same speed limits as under alternative C, resulting in long-term benefits to the safety of users and non-users by reducing the likelihood of collisions.

Education and outreach efforts at Blue Creek and Rosita Flats would be the same as those under alternative B, resulting in long-term beneficial impacts on visitor use and experience / health and safety. In addition, fences and signs would be posted at Rosita Flats to better define the ORV-use boundary, which would limit current ORV use but enhance visitor safety. Similar to alternative C, an interpretive wayside program could be implemented at Blue Creek as funding from the permit fees allows. The wayside program could be expanded based on the level of visitor interest and if funding is available. If implemented, this program would result in long-term beneficial impacts on visitor use and experience /

health and safety because visitors would be more aware of the natural and historic resources in the national recreation area.

The establishment of zones would have beneficial impacts for some users by providing a separation of uses, reducing noise in certain areas, improving the safety of ORV use, and enhancing resource conditions. However, for a minority of visitors, limiting ORV access would result in long-term minor to moderate adverse impacts. The proposed permit fee, while being an additional cost to visitors, would fund more visitor amenities that would enhance visitor use and experience at the national recreation area. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease. The overall impacts of alternative D on visitor use and experience / health and safety would be long term, minor to moderate, and adverse as well as long term and beneficial.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that would impact visitor use and experience / health and safety under alternative D would be the same as those under alternative A, and impacts would be long term, minor, and adverse. These impacts, when combined with the long-term minor to moderate adverse and long-term beneficial impacts of alternative D, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts.

Conclusion

The proposed permit fee, while being an additional cost to visitors, would fund more visitor amenities that would enhance visit use and experience at the national recreation area. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease, which would have beneficial effects on visitor health and safety. Additionally, the establishment of zones and implementation of a permit system would have beneficial impacts for the majority of visitors by separating uses, implementing rules (speed limits, headlights, and orange flags for ATVs), education, improving safety, and enhancing resource conditions at the national recreation area. Overall, impacts under alternative D would be long term, minor to moderate, and adverse, because users would need to adjust to a user fee and a zoning system, and long term and beneficial due to improvements to visitor use and experience / health and safety. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative D, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.

LAKE MEREDITH NATIONAL RECREATION AREA MANAGEMENT AND OPERATIONS

GUIDING REGULATIONS AND POLICIES

Direction for management and operations at Lake Meredith is set forth in the national recreation area's master plan (NPS 1973) and strategic plan (NPS n.d.a) and the Superintendent's Compendium (NPS 2008d). Since the establishment of the ORV special regulation 36 CFR 7.57, ORV use at the national recreation area has changed considerably, in intensity as well as in the types of ORVs used. As stated in the 2007 *Interim OHV Use Plan* (NPS 2007a), given the length of time that ORV use has been occurring at the national recreation area, it is hard to measure the level of impacts on resources, because there is no distinct baseline to measure against.

The master plan identified ORV travel and trail-biking as activities that occur at the national recreation area; however, it focused mainly around water-based uses and not on the development of land-based uses. The plan called for the need to control various visitor uses as user demand increased, noting that some areas should be designated for ORV use. The strategic plan identifies goals pertaining to staffing, fiscal planning, and infrastructure in the national recreation area. The plan also addressed long-term goals that address appropriate "servicewide" goals, as well as park-specific outcomes.

Under the Superintendent's Compendium, the national recreation area set forth the closure and public use limits the staff are required to enforce. Additionally, 16 USC 3 and 36 CFR 1(1–7) describe permit requirements and other restrictions that are imposed under the discretionary authority of the Superintendent. Regulations in the compendium related to ORV use set out areas where ORVs may be used and provide the authority for area closures. The compendium also addresses restrictions on hunting, an activity that is permitted in Blue Creek and Rosita Flats. In 2008, the compendium required recreation fees for lake use (vessels), but not for ORV use.

METHODOLOGY, ASSUMPTIONS, AND INTENSITY DEFINITIONS

National recreation area management and operations, for the purpose of this analysis, refers to the efforts of NPS staff to maintain and administer resources and provide for an effective visitor experience. This includes an analysis of the projected need for staff time and materials in relation to ORV use under each of the alternatives, as well as the various funding mechanisms available to implement these alternatives. The analysis also considers trade-offs for staff time or the budgetary needs required to accomplish the proposed alternatives and discusses each alternative in terms of its impacts on the Interpretation Division, Visitor and Resource Protection Division, Resource Management Division, Facilities Management Division and Southern Plains Fire Group at the national recreation area. Because there are no impacts anticipated for the Park Management and Administrative Division, they are not discussed further in this plan/EIS.

National recreation area staff members from each of the divisions participated in the planning team and were consulted regarding expected staffing and funding needs under each alternative. The impact analysis is based on the current description of national recreation area operations as presented in the "Affected Environment" chapter. The required level of effort is discussed in terms of "full-time equivalents," which represent the hours worked by staff. One full-time equivalent equals 40 hours in one week, which could represent one person working 40 hours a week or two part-time staff members working 20 hours a week each.

The following intensity definitions for evaluating impacts on national recreation area management and operations were determined and applied to adverse impacts.

Negligible: National recreation area operations would not be impacted or the impact would not have a noticeable or measurable impact on the national recreation area or agency operations.

Minor: Impacts would be noticeable and would result in a measurable, but small, change in the national recreation area operations. Any required changes in the national recreation area staffing and funding could be accommodated within normal budget cycles and expected annual funding without appreciably affecting other operations in the national recreation area. Current levels of funding and staffing would not be reduced or increased, but priorities may need to be changed.

Moderate: Impacts would be readily apparent and would result in a substantial change in the national recreation area operations that would be noticeable to staff and the public. Required changes in the national recreation area staffing and/or funding could not be accommodated within expected annual funding and would measurably affect other operations in the national recreation area by shifting staff and funding levels between operational divisions. Increases or decreases in staff and funding would be needed or other national recreation area operations would have to be reduced and/or priorities changed.

Major: Impacts would be readily apparent and would result in a substantial change in the national recreation area operations that would be noticeable to staff and the public and would be markedly different from existing operations. These changes in the national recreation area staffing and/or funding could not be accommodated by expected annual funding and would require the national recreation area to readdress its ability to sustain current national recreation area operations. Increases or decreases in staff and funding would be needed and/or other national recreation area programs would have to be substantially changed or eliminated.

Duration: Short-term effects would last one fiscal year or less.

Long-term effects would continue beyond one fiscal year indefinitely into the future.

Study Area

The study area for direct impacts related to national recreation area management and operations is the ORV use areas of Blue Creek and Rosita Flats. The study area for cumulative impacts is within the national recreation area boundary.

IMPACTS OF ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, the management of ORV use would continue per the requirements of the 2007 *Interim OHV Use Plan* (NPS 2007a), the regulations in 36 CFR 7.57, and regulations contained in the Superintendent's Compendium (NPS 2008d). All routes and areas not closed under these requirements would remain open to ORV use under alternative A.

Approximately 275 acres of area would be permitted for ORV use at Blue Creek, from cutbank to cutbank. Routes at Blue Creek generally stay within 0.5 mile of the creek. At Rosita Flats, 1,740 acres of area would be permitted for ORV use below the 3,000-foot elevation line. ORV use at Rosita Flats is in the Canadian River bed as well as the surrounding hills, in some cases out to a mile or more. Use outside the authorized areas is officially not permitted, although it is difficult for ORV users to determine the exact location of the 3,000-foot contour line. Staffing would remain at three people with an approximate operating cost of $270,000, which is 90 percent of the national recreation area's total $300,000 staffing costs.

Under alternative A, no new facilities or roads would be constructed and the facilities management division would continue to maintain the infrastructure that supports ORV use at the same funding level. Camping is permitted at Blue Creek and Rosita Flats without designated camping areas. Campfires are regulated under the Superintendent's Compendium. When the area is under high fire danger, campfires

are prohibited, following county burn ban regulations. The facilities management division would continue to maintain picnic tables and pit toilets at Blue Creek. Trash pickup would continue on a daily basis from mid-April to September and as needed (two to three times per week) from October to April. At Rosita Flats, picnic tables and trash receptacles would continue to be emptied once a week. Two vehicles would be allotted for trash cleanup around the national recreation area. Trash bags would continue to be provided to visitors on high-use weekends. The yearly cost of maintaining or replacing these amenities would be $8,000 per year. This would include maintaining or replacing trash cans, signs, tables, etc.

The national recreation area currently does not offer visitor interpretation at Blue Creek or Rosita Flats. However, at both ORV use areas, bulletin boards are posted with campground rules and regulations and other national recreation area information. The national recreation area would continue education through visitor contact with rangers, maintenance staff, and other park staff and through on-site educational opportunities. A site bulletin regarding ORV use is available at headquarters and at ranger stations. A larger -scale bulletin board is available at Blue Creek and Rosita Flats for the public to view. Both signs are currently out of date and need to be updated.

Law enforcement staffing levels of seven people would continue enforcement of existing ORV regulations and resource protection measures at current staffing and funding levels. Under alternative A, methods of enforcement would include patrolling Rosita Flats, with more patrols at Blue Creek due to the remote location of Rosita Flats. The national recreation area would also continue the use of interagency law enforcement at large events such as the Sand Drags.

Under this alternative, no NPS vehicle permit would be required to operate an ORV at either ORV use area. A decal is required by the state of Texas for all motorized vehicles, but this is not administered by Lake Meredith. There would be no limitations on the times when vehicles would operate and no new speed limits would be implemented. Additionally, no user capacity would be designated in the Rosita Flats and Blue Creek ORV use areas.

Regularly scheduled maintenance activities would be conducted for facilities and would include infrastructure maintenance and upkeep, standard repairs to roads and concrete ramps, regular park facility maintenance, and monitoring the condition of the McBride House for signs of degradation. Yearly maintenance costs (including fuel for these activities) are approximately $37,000.

The implementation of alternative A would result in no changes to the current management of motorized vehicles in the national recreation area. Therefore, the impacts of managing motorized vehicle access under the no-action alternative would be long term, negligible, and adverse.

Cumulative Impacts

The NPS has started an interactive planning process to develop a GMP that would articulate the long-term vision that would guide the management of the national recreation area for the next 15 to 20 years. The GMP lays the groundwork for the more detailed planning and day-to-day decision making that will follow. The GMP would provide for public use at the national recreation area, identify development and management actions that satisfy recreational needs, and guide all future recreation development and management at the national recreation area. Actions arising from this plan have the potential to increase resource protection and improve visitor use/experience. Short-term impacts on management and operations at the national recreation area would be minor to moderate and adverse, because additional time and funding would be required to implement the plan. However, over the long term, the impacts of implementing the GMP would be beneficial, because the plan would guide management and potentially eliminate or reduce current management issues.

Past, present, and reasonably foreseeable future actions that have the potential for cumulative impacts under alternative A would include the implementation of the 1996 Resource Management Plan, invasive species removal, implementation of the 1998 Wildland Fire Management Plan, and the 2002 Oil and Gas Management Plan. All management plans and actions must be consistent with law, NPS policy and standards. The resource management plan provides goals for the national recreation area that address enhancing recreational opportunities managed by partners and ensuring organizational effectiveness. Additionally, the resource management plan guides treatment for saltcedar and other nonnative plants, which will continue to be managed by the Resource Management Division. The fire management plan defines management of wildland fire and outlines a prescribed fire program for the national recreation area. As stated in the "Lake Meredith National Recreation Area Management and Operations" section in chapter 3, the prescribed fire program would be controlled by the Southern Plains Fire Group, which is responsible for the implementation of prescribed fires in seven parks. The implementation of the oil and gas management plan likely resulted in adverse impacts on national recreation area resources and operations, because an increase in staff and funding was needed during and after construction. All of these plans have resulted in, and would continue to result in, short- and long-term negligible to minor adverse impacts on management and operations from the additional funding and staff required for implementation. However, long-term beneficial impacts would also result, because all the plans would guide current and future management in the national recreation area.

Throughout the national recreation area, regularly scheduled maintenance activities are conducted to maintain facilities and ensure visitor health and safety. These activities have involved infrastructure maintenance and upkeep, such as ensuring water quality and access. Standard repairs to roads and concrete ramps occur on a regular basis. Regular park facility maintenance is continually occurring at Lake Meredith. To ensure that historic structures remain in good condition, the NPS continually monitors the condition of the McBride House to ensure that if any degradation occurs, funding can be sought to stabilize and repair the structure. The potential for impacts on soils, vegetation, park operations, and visitor experience exists from maintenance activities. The national recreation area coordinates with adjacent law enforcement in case of a fire or for large events (such as the Sand Drags).

The annual Sand Drags event, held every February, attracts thousands of spectators and hundreds of motorcycles, four wheelers, sand rails, and river buggies. Although the Sand Drags is private and is held outside the national recreation area, there is a substantial increase in visitor use at Lake Meredith associated with this annual event. This dramatic increase in visitation requires greater law enforcement and park management services, resulting in short-term minor adverse impacts on management and operations. Additionally, the increased intensity of ORV use has the potential to adversely affect natural resources, potentially resulting in further adverse effects on management and operations at the national recreation area.

The Texas Off-Highway Vehicle Program encourages the responsible use of OHVs. The program is also designed to provide funding to develop more OHV friendly recreational areas. Under Texas State Law, an OHV decal is required for all individuals operating an OHV on public land in Texas, or lands that have been purchased with TPWD OHV grants, and is valid for a one-year period. The state of Texas requires that all OHV users purchase and display the decal prior to operating the vehicle on public lands, including in the national recreation area. The program could result in short-term minor adverse impacts because users would be required to purchase the decals. However, long-term beneficial effects could result because revenue generated by the sale of the decal would be used to help municipalities, counties, state or federal agencies, and non-profit corporations to create new or improve existing OHV use areas in national recreation areas in Texas.

Hunting is a popular activity at Lake Meredith, with game species including dove, turkey, quail, duck, goose, and white-tailed and mule deer. The use of ORVs has been a popular means of transportation for

visitors engaging in hunting in the national recreation area. Park rangers ensure that hunting occurs in correctly zoned areas, which results in safety for other visitors using the national recreation area for non-hunting-related activities. Allowing ORVs into hunting areas may have adverse effects for walk-in hunters; the noise and disturbances from ORVs could impact the success of hunters. Impacts on hunters who use ORVs to access hunting areas could be beneficial because they would not be required to walk into hunting areas. As a result, there would be long-term negligible to minor adverse or long-term beneficial impacts on hunters, depending on whether they use ORVs to enter hunting areas.

Permits are required to boat at Lake Meredith. Permits can be purchased at park headquarters in Fritch, the marina at Lake Meredith, or area bait shops. A one-day permit costs $4; a three-day permit, $10; and an annual permit, $40. Permits are half price for holders of the Golden Age or Golden Access Pass. The fees from these permits provide money for the national recreation area to create and maintain amenities for visitor use, resulting in long-term beneficial impacts on management and operations.

Although the plans and projects described above could result in both adverse and beneficial effects on operations and management, the overall parkwide impacts of past, present, and foreseeable future actions would be long term, minor, and adverse. In combination with the long-term negligible adverse impacts of alternative A, overall cumulative impacts on national recreation area operations and management would be parkwide, long term, negligible to minor, and adverse.

Conclusion

Staffing and funding levels would continue at the same levels as currently managed. The total approximate cost of implementing alternative A would be $315,000. Actions under alternative A would result in long-term negligible adverse impacts because there would be no noticeable change in national recreation area management and operations. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative A, would result in parkwide long-term negligible to minor adverse impacts on national recreation area management and operations.

IMPACTS OF ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B, the national recreation area would, in part, base the designation of routes and areas on a zoning system, one purpose of which would be the separation of visitor uses that have the potential to conflict with one another. Established zones could include camping -only zones, hunting zones, resource protection zones, low-speed zones, and beginner zones.

The established zones under alternative B would be patrolled by rangers to make sure visitors use zone areas appropriately. A camping zone would be established with a recommended speed limit of 15 mph. No additional amenities would be provided beyond what is described under alternative A.

Recreational ORV use would temporarily be suspended for approximately two to eight weeks (up to two months) during rifle hunting season, and rangers would patrol to ensure there is no recreational ORV use. A new 20 mph low-speed beginner zone would be implemented at Rosita Flats. At Blue Creek a new low-speed zone for family use on either side of the FM 1913 bridge would be developed. Finally, a resource protection zone would be designated east of Bull Taco Hill where ORVs with a wheel width greater than 64 inches would not be permitted. An ORV parking area and fencing would be installed nearby to provide pedestrian access. The cost of building and purchasing posts and cables for fencing would be approximately $250,000. Yearly maintenance and upkeep costs, including fuel for transportation, would be approximately $154,000. This would include maintenance to the proposed fence under this alternative and other actions as described under alternative A. In ORV routes and areas, a recommended speed limit

of 35 mph on ORV routes and 55 mph on sand bottom flats would be added. Enforcement of the zones would increase law enforcement responsibilities because more frequent patrols would be required. In addition, maintenance staff would have increased staff responsibilities from the installation and maintenance of fencing.

The national recreation area would hire a new facility employee at a cost of $45,000 per year and two new law enforcement employees at $200,000 per year. Two new vehicles would be purchased for law enforcement purposes at an approximate cost of $17,000 each. Additionally, one new maintenance vehicle would be purchased for approximately $9,000. The hiring of new employees and purchasing of three new vehicles would result in long-term beneficial impacts because more staff would help the national recreation area's operations run more smoothly and additional vehicles would provide the opportunity for staff to visit more areas of the national recreation area. However, the additional staffing requirements may not be covered by existing funding sources, requiring a shift in staffing or a change in priorities, which would result in long-term moderate adverse impacts.

Under alternative B, a no-cost permit would be required for access to ORV use areas. The permit would consist of a piece of paper or brochure and would contain ORV regulations and information, and could be revoked for violation of the ORV regulations. The permit would need to be signed by the operator and kept in the vehicle. The implementation of an ORV permit would result in additional staff time requirements for both the national recreation area's administrative staff to issue the permit, and the law enforcement staff needed to check users for the permit.

At Blue Creek and Rosita Flats a larger -scale bulletin board would be available for the public to view. The national recreation area would provide safety literature, a "tread lightly" pamphlet, and trash bags to users. ORV and other rules could be printed on the trash bags. Rangers would actively seek out visitors and provide them with safety literature or trash bags, which would increase visitor contact. More educational signs would be posted in ORV use areas. The national recreation area would provide ORV safety programs in local schools, attend the Fritch "Howdy Neighbor Day," and include more education about ORV use at community events. ORV education would be added to the already established "Water Safety Day." The national recreation area would provide signs to local businesses containing the national recreation area's use area map and rules. A volunteer group would be established to help clean up ORV use areas and other efforts. Park interpretive staff would be responsible for implementing these activities and would need to devote more time to education related to ORV management, which could result in short- and long-term minor adverse impacts on management and operations from the additional funding required for implementation. However, these educational efforts would be expected to increase compliance and reduce the need for law enforcement staff, resulting in long-term beneficial impacts on management and operations.

Under this alternative, the facilities management division would provide picnic tables and pit toilets and trash pickup at Blue Creek and Rosita Flats. The implementation of these improvements would cost approximately $1.1 million.

Rules and regulations for ORV use at Blue Creek and Rosita would be enforced by park law enforcement officers. To track noncompliance in ORV use areas and routes, aerial imagery could be used. National recreation area staff would post signs prohibiting ORV use in isolated pools during times of drought. Additionally, if ORV use outside designated routes and areas is found, this could cause routes and areas to be closed temporarily, resulting in increased staffing needs for resource management staff. Park rangers would also measure ORVs for a 96 dBA limit. The national recreation area would also continue the use of interagency law enforcement at large events such as the Sand Drags.

Alternative B would lead to increased ranger patrols as well as increased law enforcement requirements such as temporarily closing areas, patrolling zones, and checking for permit compliance, which could lead to the need for more staff members. In addition, the increase in ORV education would result in more demands on the interpretive staff's time and the installation of fences and amenities would increase requirements for those in facilities management. However, the increase in park patrols and education could decrease the number of visitor violations, resulting in long-term beneficial impacts on these divisions. Therefore, impacts under alternative B in the national recreation area would be long term, minor to moderate, and adverse, with impacts more moderate than minor because a fee permit system would not be in place to help offset additional expenses. Impacts would be apparent and could result in a substantial change in the national recreation area's staffing, either requiring additional funding or requiring shifting of responsibilities in the national recreation area.

Cumulative Impacts

The effects of past, present, and reasonably foreseeable future actions on national recreation area operations and management would be the same as described for alternative A: long term, minor, and adverse. In combination with the long-term minor to moderate adverse impacts of alternative B, overall cumulative impacts on operations and management would be long term, minor to moderate, and adverse.

Conclusion

The implementation of alternative B would require additional efforts from park staff. Law enforcement staff levels would be increased to ensure compliance with the additional regulations under alternative B. Additionally, there would be an increase in responsibilities for the interpretation and resource management staff. The total approximate cost of implementing alternative B would be $1,775,000. The implementation of alternative B would result in long-term minor to moderate adverse impacts on national recreation area management and operations, with impacts more moderate than minor because a fee permit system would not be in place to help offset additional expenses. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative B, would result in long-term minor to moderate adverse impacts.

Impacts of Alternative C: Management through Use of a Permit System at Current ORV Use Areas

Under alternative C, the national recreation area would manage ORV use through a permit system and through the establishment of use limits. Permits would include a fee, and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except there would be one designated ORV use area in Rosita Flats instead of two.

At Rosita Flats ORV use would be redefined. The areas south of the river (currently denuded of vegetation) would be open and designated access points would not be established at the riverbed area. Under this alternative, a fee permit would be required to access ORV use areas. The price of the permit would be based on existing use permits at the national recreation area. This plan/EIS will not set or determine the cost of the fee permit, but it would likely be similar to the current boat permit ($4 per day, $10 for three days, and $40 for an annual permit). The same permit would be allowed at both Blue Creek and Rosita Flats. While there would be no initial limits on the number of permits issue, use limits could be developed based on indicators and standards developed during the GMP process. Permits would be available for purchase at headquarters, by mail, online, or at other vendors, and could be revoked for violation of ORV regulations. A kiosk and "Iron Ranger" could be used to supply daily permits. The permit would be in sticker form and would be placed on the bumper of the ORV. The permit holder would also receive a national recreation area regulations brochure. Money collected from the fee permit

would be used to fund education/interpretation programs, camping amenities, and law enforcement activities. The implementation of an ORV permit would result in additional staff requirements for national recreation area administrative staff to issue the permit and law enforcement staff to check that users have the permit. The use of an “Iron Ranger” would require daily attendance to ensure fees are collected and permits are replenished, which would require more frequent time-consuming trips to Rosita Flats by national recreation area staff.

Under alternative C, the national recreation area would hire a new facility employee at a cost of $45,000 per year, a new law enforcement employee at $100,000 per year, and a new administrative assistant at $35,000 per year. These new employees would be beneficial as they would aid in current operations and would help the national recreation area to run more smoothly. A new law enforcement vehicle would be purchased at an approximate cost of $17,000. This vehicle could be used to make additional trips to Rosita Flats or to patrol other parts of the national recreation area. Additionally, one new maintenance vehicle would be purchased for approximately $9,000. The hiring of new employees and purchasing of new vehicles would result in long-term beneficial impacts because more staff would help the national recreation area’s operations run more smoothly and additional vehicles would help staff be able to visit more areas of the national recreation area. Although there would be beneficial impacts, the associated costs could result in short- and long-term minor to moderate adverse impacts on management and operations because some shifts in staffing may result to address ORV management needs.

Under alternative C, park staff would install fencing and signs around the ORV use boundary at Rosita Flats to better define use in the area, requiring additional time for installation and maintenance by facility management staff. The cost of implementation and materials would be approximately $200,000. In addition to the educational programs described under alternative B, an interpretive wayside program would be initiated at Blue Creek and expanded as necessary. The cost of the program would be covered by the permit fee; however, the general overall increase in educational programs would increase responsibilities for park interpretive staff.

Camping areas would be designated as tent and vehicle camping only with lower speed limits, as described under alternative B. Pit toilets, fire rings, and picnic tables in the designated camping areas would be added on a phased-in basis. While these amenities would be a high priority, other amenities could include shade shelters, emergency call stations, and additional kiosks or bulletin boards for more information. The installation and maintenance of additional amenities, although in part covered by fees from the permit system, would increase responsibilities for the facilities management division of the national recreation area. Yearly maintenance and upkeep costs (including fuel) would be approximately $37,000. This would include maintenance to the proposed fence under this alternative and other actions as described under alternative A. The yearly cost of new amenities would be $8,000 per year. This would include new trash cans, signs, tables, and more.

Rules and regulations for ORV use at Blue Creek and Rosita Flats would be enforced by park law enforcement officers, as described under alternative B. In addition, the national recreation area would possibly have law enforcement staff located closer to Rosita Flats. As with alternative B, this would require additional time from law enforcement staff, possible new staff to be hired, as well as accommodations to be found closer to Rosita Flats.

Alternative C would lead to increased ranger patrols, as well as increased law enforcement requirements such as temporarily closing areas, patrolling zones, and checking for permit compliance, which could lead to the need for more staff members. In addition, the increase in ORV education would result in more demands on the interpretive staff’s time, and the installation of fences and amenities would increase requirements for those in facilities management. However, the increase in park patrols and education could decrease the number of visitor violations, resulting in long-term beneficial impacts on these

divisions. Although there would be an increase in demands on staff time, alternative C would offset these additional staffing requirements and funds for amenities, in part, by the permit fees for ORV use.

Overall, impacts under alternative C in the national recreation area would be long term, minor to moderate, and adverse, with impacts mostly being minor. Impacts would be apparent and could result in a substantial change in the national recreation area's staffing, either requiring additional funding, which would in part be offset by the permit fees, or requiring shifting of responsibilities in the national recreation area.

Cumulative Impacts

The effects of past, present, and reasonably foreseeable future actions on national recreation area operations and management would be the same as described for alternative A and would be long term, minor, and adverse. In combination with the long-term minor to moderate adverse impacts of alternative C, overall cumulative impacts on operations and management would be long term, minor to moderate, and adverse.

Conclusion

The implementation of alternative C would require additional efforts from national recreation area staff in the areas of law enforcement, resource management, interpretation, and facilities management, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative C would be $442,500 and would be offset, in part, by money collected in the proposed fee system. The implementation of alternative C would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative C, would result in long-term minor to moderate adverse cumulative impacts.

Impacts of Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas

Under alternative D, the national recreation area would, in part, base the designation of routes and areas on a zoning system, one purpose of which would be the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. Like under alternative C, a fee permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area, but no use limits would be established. Under this alternative, a fee permit would be required for access to the ORV use areas. As described under alternative C, the price of the permit would not be determined in this plan/EIS but would be based on existing use permits at the national recreation area (such as boating fees, which are $4 per day, $10 for three days, or $40 per year) and the same permit would be valid at both Blue Creek and Rosita Flats. Permits would be available for purchase at headquarters, by mail, online, or at other vendors, and could be revoked for violation of ORV regulations. A kiosk and "Iron Ranger" could be used to supply daily permits, which would be in decal form and would be placed on the bumper of the ORV. The permit holder would also receive a national recreation area regulations brochure. As stated under alternative C, the implementation of an ORV permit would result in additional staff time requirements for both administrative and law enforcement staff. Therefore, the implementation of a fee program could possibly lead to short-term minor adverse impacts. However, long-term impacts would be beneficial because fees received from this permit would help fund education/interpretation programs, camping amenities, and law enforcement activities.

Under alternative D, hired staff and vehicle purchases would be the same as under alternative C. The hiring of new employees and purchasing of new vehicles would result in long-term beneficial impacts because additional staff and vehicles would help the national recreation area operations run more smoothly and enable staff to visit more areas of the national recreation area. Changes in current staffing and responsibilities would not be anticipated, because the workload would be more evenly distributed.

Under alternative D, park staff would install fencing and signs around the ORV use boundary at Rosita Flats to better define use in the area, requiring additional time for the installation and maintenance by facility management staff. The cost of fencing and sign materials would be approximately $250,000. Fencing and signs would result in long-term benefits to management and operations because they would better define the ORV use boundary and help park staff ensure that users respect the boundary. Short-term adverse impacts would be minor to moderate because the cost of building and purchasing fencing materials would be $250,000; however, long-term impacts would be beneficial because the fencing and signs would help park staff enforce the boundaries of use areas within the national recreation area.

In addition to the educational programs described under alternative C, an interpretive wayside program would be initiated at Blue Creek and expanded as necessary. The cost of the program would be covered by the permit fee; however, the general overall increase in educational programs would increase responsibilities for park interpretive staff.

Camping areas would be designated as tent and vehicle camping only with lower speed limits, as described under alternative C. Pit toilets, fire rings, and picnic tables in the designated camping areas would be added on a phased-in basis. While these amenities would be a high priority, other amenities could include shade shelters, emergency call stations, and additional kiosks or bulletin boards for more information. An estimated $1.1 million would be allotted to purchase these amenities. The installation and maintenance ($154,000 allowance) of additional amenities, although in part covered by fees from the permit system, would increase responsibilities for the facilities management division of the national recreation area.

Similar to alternatives B and C, rules and regulations for ORV use at Blue Creek and Rosita Flats, including a zoning system, would be enforced by park law enforcement officers and it is possible that law enforcement staff would be located closer to Rosita Flats. This would require additional time from law enforcement staff, as well as accommodations closer to Rosita Flats.

Alternative D would lead to increased ranger patrols and the hiring of a new law enforcement officer, as well as increased law enforcement requirements such as temporarily closing areas, patrolling zones, and checking for permit compliance. In addition, the increase in ORV education would result in minor long-term demands on the interpretive staff’s time, and the installation of fences and amenities would increase short-term requirements for those in facilities management. However, the increase in park patrols and education could decrease the number of visitor violations, resulting in long-term beneficial impacts through money received from citations. Although there would be an increase in demands on staff time, alternative D would offset these additional staffing requirements and funds for amenities, in part, by the ORV use permit fees.

Overall, impacts under alternative D in the national recreation area would be long term, minor to moderate, and adverse. Impacts would be apparent and could result in a substantial change in the national recreation area’s staffing, either requiring additional funding, which would in part be offset by the permit fees, or requiring the shifting of responsibilities in the national recreation area.

Cumulative Impacts

The effects of past, present, and reasonably foreseeable future actions on national recreation area operations and management would be the same as described for alternative A: long term, minor, and adverse. In combination with the long-term minor to moderate adverse impacts of alternative D, overall cumulative impacts on management and operations would be long term, minor to moderate, and adverse.

Conclusion

The implementation of alternative D would require additional efforts from park staff in the area of law enforcement, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative D would be $1,775,000. The implementation of alternative D would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative D, would result in long-term minor to moderate adverse cumulative impacts.

IRREVERSIBLE OR IRRETRIVEABLE COMMITMENTS OF RESOURCES

The NPS must consider whether the effects of the alternatives cannot be changed or are permanent (that is, the impacts are irreversible). The NPS must also consider whether the impacts on a park resource would mean that once gone, the resource could not be replaced; in other words, the resource could not be restored, replaced or otherwise retrieved (NEPA Section102(c)(v)).

An irreversible commitment of resources is defined as the loss of future options. The term applies primarily to the effects of using nonrenewable resources, such as minerals or cultural resources, or to those factors such as soil productivity that are renewable only over long periods. It could also apply to the loss of an experience as an indirect effect of a “permanent” change in the nature or character of the land.

An irretrievable commitment of resources is defined as the loss of production, harvest, or use of natural resources. The amount of recreation activities foregone is irretrievable, the action is not irreversible. If the use changes, it is possible to resume production.

ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Under alternative A, there would be long-term irretrievable impacts to soils, vegetation, water resources, soundscapes, wildlife and wildlife habitat, and the Arkansas River shiner. Impacts to archeological resources due to unrestricted ORV use at Blue Creek and Rosita Flats may be irretrievable. Associated physical damage to these resources would result from continued ORV use in areas where these resources exist. Irretrievable impacts to vegetation, water quality, wildlife and wildlife habitat, and the Arkansas River shiner would be moderate, due to the extent of ORV use across Blue Creek and Rosita Flats, as well as the continuation of an unclear ORV use boundary at both areas. Under this alternative, the ability of visitors to experience these resources may be lost to a great degree.

ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Under alternative B, ORV use at Rosita Flats and Blue Creek would occur at levels that would impact park resources such as soils, vegetation, water resources, soundscapes, wildlife and wildlife habitat, and

the Arkansas River shiner. These impacts would represent irretrievable, but not irreversible, losses to the quality of the resource. Under this alternative, the ability of visitors to experience these resources may be lost to a certain degree. However, management actions under this alternative would improve conditions of these resources over current conditions. Under this alternative, archeological resources would be protected because ORV use would be confined to designated routes and areas. This alternative would represent a loss of the free driving experience that is currently occurring. However, the permit system and other proposed actions would improve the visitor safety and experience of those who chose to visit the national recreation area. While there would be some irretrievable losses, these would not be irreversible.

ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Under alternative C, ORV use at Rosita Flats and Blue Creek would occur at levels that would impact park resources such as soils, vegetation, water resources, soundscapes, wildlife and wildlife habitat, the Arkansas River shiner, and archeological resources. These impacts would represent irretrievable, but not irreversible, losses to the quality of the resource. Under this alternative, the ability of visitors to experience these resources may be lost to a certain degree. However, the proposed management actions, including designated routes and areas, a special use permit, additional law enforcement, and other educational efforts would improve the condition of these resources. Under this alternative, archeological resources would be protected because ORV use would be confined to designated routes and areas. This alternative would represent a loss of the unrestricted and free driving experience that is currently occurring. However, the permit system and other proposed actions would improve the visitor safety and experience of those who chose to visit the national recreation area. While there would be some irretrievable losses, these would not be irreversible.

ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

Under alternative D, ORV use at Rosita Flats and Blue Creek would occur at levels that would impact park resources such as soils, vegetation, water resources, soundscapes, wildlife and wildlife habitat, the Arkansas River shiner, and archeological resources. These impacts would represent irretrievable, but not irreversible, losses to the quality of the resource. Under this alternative, the ability of visitors to experience these resources may be lost to a certain degree. However, the proposed management actions, including the zone system, designated routes and areas, a special use permit, additional law enforcement, and other educational efforts would improve the condition of these resources. Under this alternative, archeological resources would be protected because ORV use would be confined to designated routes and areas. This alternative would represent a loss of the unrestricted and free driving experience that is currently occurring. However, the permit system and other proposed actions would improve the visitor safety and experience of those who chose to visit the national recreation area. While there would be some irretrievable losses, these would not be irreversible.

SUSTAINABILITY AND LONG-TERM MANAGEMENT

In accordance with NEPA, and as further explained in Director's Order 12, consideration of long-term impacts and the effects of foreclosing future options should pervade any NEPA document. According to Director's Order 12, and as defined by the World Commission on Environment and Development, "sustainable development is that which meets the needs of the present without compromising the ability of future generations to meet their needs." For each alternative in a NEPA document, considerations of sustainability must demonstrate the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. This is described below for each alternative.

The NPS must consider if the effects of the alternatives involve tradeoffs of the long-term productivity and sustainability of park resources for the immediate short-term use of those resources. The NPS must also consider if the effects of the alternatives are sustainable over the long term without causing adverse environmental effects for future generations (NEPA section 102(c)(iv)).

ALTERNATIVE A: NO ACTION – CONTINUATION OF CURRENT MANAGEMENT

Alternative A would trade any long-term productivity for short-term use of resources at the recreation area. Off-road use and demand for a range of visitor opportunities, to include demand for increased motorized access, would likely continue to grow over time or remain at high levels, and use the park's resources at the expense of the long-term productivity and sustainability of soils, vegetation, wildlife and wildlife habitat, threatened and endangered species, and archeological resources.

ALTERNATIVE B: ZONE SYSTEM – SEPARATION OF VISITOR USES, WITH A PERMIT FOR EDUCATIONAL PURPOSES

Alternative B would result in the long-term commitment of human resources and long-term adverse impacts to recreation area visitors and the local economy from restricting the areas where ORV are permitted within the recreation area. However, there would be long-term productivity of the park's natural and physical resources (soils, vegetation, wildlife and wildlife habitat, threatened and endangered species, and archeological resources) and a sustainable use of the resources at Lake Meredith National Recreation Area. To be sustainable, this alternative requires long-term management, including protecting the recreation area's productivity.

ALTERNATIVE C: MANAGEMENT THROUGH USE OF A PERMIT SYSTEM AT CURRENT ORV USE AREAS

Alternative C would result in the long-term commitment of human resources and long-term adverse impacts to recreation area visitors and the local economy from requiring a permit for ORV use. However, there would be long-term productivity of the park's natural and physical resources (soils, vegetation, wildlife and wildlife habitat, threatened and endangered species, and archeological resources) and a sustainable use of the resources at Lake Meredith National Recreation Area. To be sustainable, this alternative requires long-term management, including protecting the recreation area's productivity.

ALTERNATIVE D: MANAGEMENT THROUGH USE OF A ZONING AND PERMITTING SYSTEM AT CURRENT ORV USE AREAS

Alternative D would result in the long-term commitment of human resources and long-term adverse impacts to recreation area visitors and the local economy from restricting the areas where ORV are permitted within the recreation area. However, there would be long-term productivity of the park's natural and physical resources (soils, vegetation, wildlife and wildlife habitat, threatened and endangered species, and archeological resources) and a sustainable use of the resources at Lake Meredith National Recreation Area. To be sustainable, this alternative requires long-term management, including protecting the recreation area's productivity.

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Consultation and Coordination

CHAPTER 5

CHAPTER 5: CONSULTATION AND COORDINATION

The intent of the NEPA is to encourage the participation of federal and state involved agencies and affected citizens in the assessment procedure, as appropriate. This section describes the consultation that occurred during development of this plan/EIS, including consultation with stakeholders and other agencies. This chapter also includes a description of the public involvement process and a list of the recipients of this document.

HISTORY OF PUBLIC INVOLVEMENT

The public involvement activities for this plan/EIS fulfill the requirements of NEPA and NPS Director's Order 12 (NPS 2011a).

THE SCOPING PROCESS

The NPS divides the scoping process into two parts: internal scoping and external, or public, scoping. Internal scoping involved discussions among NPS personnel regarding the purpose of and need for management actions, issues, management alternatives, mitigation measures, appropriate level of documentation, available references and guidance, and other related topics.

Public scoping is the early involvement of the interested and affected public in the environmental analysis process. The public scoping process helps ensure that people have an opportunity to comment and contribute early in the decision-making process. For this plan/EIS, project information was distributed to individuals, agencies, and organizations early in the scoping process, and each was given the opportunity to express concerns or views and to identify important issues or other alternatives.

Taken together, internal and public scoping are essential elements of the NEPA planning process. The following sections describe the various ways scoping was conducted for this plan/EIS.

Internal Scoping

An internal scoping meeting was held at the Lake Meredith National Recreation Area Administration Building/Headquarters in Fritch, Texas, from October 16 to 18, 2007. Internal scoping involves discussions among NPS staff to decide what should be analyzed in an EIS. Personnel from Lake Meredith National Recreation Area and the NPS Environmental Quality Division attended this meeting to define the purpose, need, and objectives of the plan, identify potential issues, discuss preliminary alternatives, and define data needs.

Various roles and responsibilities for developing the ORV management plan were also clarified. The results of the meetings were captured in a report now on file as part of the administrative record. Representatives from the NPS–Washington Office / Environmental Quality Division, NPS–Southeast Arizona Group, Lake Meredith National Recreation Area, and the Louis Berger Group participated in the internal scoping meetings.

Public Scoping

Public Meetings and Comments

Public scoping efforts for this planning process focused on the means or processes to be used to include the public, major interest groups, and local public entities. Based on past experience, national recreation area staff placed a high priority on meeting the intent of public involvement in the NEPA process and giving the public an opportunity to comment on proposed actions.

The public scoping process began on June 11, 2008, with the publication of a Notice of Intent in the Federal Register (FR, Volume 73, Number 113). In support of this effort, the NPS hosted three public scoping meetings intended to initiate public involvement early in the planning stages of the plan/EIS and to obtain community feedback on the initial purpose, need, and objective statements for ORV management at Lake Meredith National Recreation Area. The meeting schedule, locations, and attendance figures follow.

- On Tuesday, July 8, 2008, a public meeting was held in Fritch, Texas, at the Sanford-Fritch Middle School Cafeteria from 6:00 p.m. to 8:00 p.m. Seventy-two people attended.
- On Wednesday, July 9, 2008, a public meeting was held in Dumas, Texas, at the First State Bank Community Room from 6:00 p.m. to 8:30 p.m. Twenty-nine people attended.
- On Thursday, July 10, 2008, a public meeting was held in Amarillo, Texas, at the Ambassador Hotel from 6:00 p.m. to 8:00 p.m. One hundred fifteen people attended.

Each of the meetings began with an open house, allowing the public to circulate between information stations. Each station had display boards and other informational materials describing the project background, legislative framework such as the park's enabling legislation, the purpose of and need for the plan, objectives of the plan, and issues to be addressed in the plan/EIS. NPS staff members were available at each station to answer any questions or concerns presented by the community and to record comments. During each meeting, NPS staff members gave a brief presentation to explain the project and the NEPA process.

Each information station had a flipchart where an assigned staff person could take comments on a particular topic, or any other topic on which a community member had concerns or questions. If commenters chose not to make comments at the stations, comment sheets were provided to be completed and returned later. If attendees chose not to fill out the comment sheets at the meeting, a return address was provided on the sheets to mail to the park at a later date. Those attending the meetings were also given brochures providing additional opportunities for comment on the project, including directing comments to the NPS Planning, Environment, and Public Comment (PEPC) website at http://parkplanning.nps.gov/lamr/. Comments were accepted through July 28, 2007.

The Comment Analysis Process

Comment analysis is a process used to compile and correlate similar public comments into a usable format for decision makers and the plan/EIS interdisciplinary planning team. Comment analysis assists the team in organizing, clarifying, and addressing technical information pursuant to NEPA regulations. It also aids in identifying the topics and issues to be evaluated and considered throughout the planning process.

A comment analysis report was prepared to summarize concern statements as well as the full text of all comments corresponding to the appropriate concern statement. All scoping comments were considered to

be important as useful guidance and public input to the public scoping process. With regard to developing the plan/EIS, comments in favor of or against the proposed action or alternatives, those that only agree or disagree with NPS policy, and those that offer opinions or provide information not directly related to the issues or impact analysis were considered non-substantive comments. Non-substantive comments can provide background for a draft or final EIS but do not require a specific response. Although the analysis process attempts to capture the full range of public concerns, the content analysis report should be used with caution. Comments from people who chose to respond do not necessarily represent the sentiments of the entire public.

Of the 180 comments received during public scoping, 77 were related to alternative elements; 24 to the affected environment at the national recreation area; 63 to preliminary management concepts; 3 to the national recreation area's purpose and significance; and 4 to the impact of the proposal and alternative elements. Nine comments were miscellaneous.

Public Scoping on the Preliminary Range of Alternatives

In the spring of 2010, Lake Meredith National Recreation Area released a range of preliminary alternatives for the plan/EIS for public review and comment. The draft range of alternatives, which was developed in part with the input received during public scoping, was presented in a brochure that was available locally at the park and on the NPS PEPC website (http://parkplanning.nps.gov/lamr). In addition, brochures were mailed to a list of park stakeholders. The public was invited to submit comments on the scope of the planning process and potential alternative elements from April 7 through May 19, 2010.

The NPS held meetings to inform the public about the preliminary alternatives for the plan/EIS. The dates, locations, and attendance figures follow.

- On April 20, 2010, a public meeting was held in Fritch, Texas, at the Sanford-Fritch Schools Business Office from 5:30 p.m. to 7:30 p.m. Thirty-three people attended.
- On April 21, 2010, a public meeting was held in Dumas, Texas, at the First National Bank from 5:30 p.m. to 7:30 p.m. Seventeen people attended.
- On April 22, 2010, a public meeting was held in Amarillo, Texas, at the Ambassador Hotel from 5:30 p.m. to 7:30 p.m. Forty-six people attended.

Each of the meetings was conducted in the same format as the earlier public scoping meetings, except the information provided and the discussions focused on the range of alternatives.

All comments were reviewed and analyzed in the same manner as previously described. During the comment period for the preliminary range of alternatives, 31 pieces of correspondence were received, containing 121 comments. Pieces of correspondence were received at the public meeting (on flipcharts), entered directly into PEPC by the commenter, or received through the mail.

Public Review of the Draft Plan/EIS

After the EPA's release of the Notice of Availability to prepare the draft plan/EIS, a 60-day public comment period was open between January 25, 2013, and March 26, 2013. This public comment period was announced online (www.parkplanning.gov/lamr), in newspaper articles, and through press releases.

The draft plan/EIS was made available through several outlets, including the NPS PEPC website (http://parkplanning.nps.gov/), hardcopies at the recreation area's headquarters, and by request through

the mail. After reviewing the draft plan/EIS, the public was encouraged to submit comments about the draft plan/EIS through the NPS PEPC website, by postal mail sent directly to the recreation area, delivered in person directly to the recreation area, or at public meetings. Written comments were accepted during the public meetings on comment forms and on flip charts.

Two public meetings were held in March 2013 to provide information about the plan and the alternatives considered, continue the public involvement process, and obtain input on the draft plan/EIS for ORV use at Lake Meredith. The public meetings held during the public comment period for the draft plan/EIS are listed below:

- March 19, 2013: Ashmore Inn and Suites in Amarillo, Texas (33 attendees).
- March 20, 2013: Sanford-Fritch Schools, Business Office, in Fritch, Texas (19 attendees).

A total of 52 meeting attendees signed in during the two meetings. The meetings were conducted in an open house style, in which displays were stationed around the room and members of the public were able to ask questions. Recreation area staff members were available at the meetings to answer questions and provide additional information to attendees. Participants were encouraged to provide comments at the meeting on flip charts or on comment forms. Participants were encouraged to provide comments after the meeting using the NPS PEPC website, comment card, or posted letter.

During the public comment period, 116 pieces of correspondence were entered into the PEPC website. Some members of the public entered comments directly into the PEPC website. The NPS or its contractor uploaded hardcopy letters and comment forms sent to the NPS.

Once the correspondences were entered into PEPC, each was read and specific comments within each correspondence were identified. One hundred and ninety six individual comments were derived from the correspondences received. During coding, comments were classified as substantive or non-substantive. A substantive comment is defined in the NPS Director's Order 12 Handbook as one that does one or more of the following (NPS 2001, Section 4.6A):

- Question, with reasonable basis, the accuracy of information presented in the EIS;
- Question, with reasonable basis, the adequacy of the environmental analysis;
- Present reasonable alternatives other than those presented in the EIS; and/or
- Cause changes or revisions in the proposal.

As further stated in the Director's Order 12 Handbook, substantive comments "raise, debate, or question a point of fact or policy. Comments in favor of or against the proposed action or alternatives, or comments that only agree or disagree with NPS policy, are not considered substantive." Non-substantive comments offer opinions or provide information not directly related to the issues or impact analysis. Non-substantive comments were acknowledged and considered by the NPS, but did not require responses. Substantive comments were grouped into issues and "concern statements" prepared for responses. Members of the NPS planning team responded to the concern statements, and these responses are included in "Appendix B: Public Comment Summary Report."

This final plan/EIS will be posted on the NPS PEPC website (http://parkplanning.nps.gov/lamr) and copies will be distributed to agencies, organizations, elected officials, and other entities or individuals who requested a copy. The publication of the EPA Notice of Availability of this final plan/EIS in the Federal Register will initiate a 30-day wait period. After the wait period, the Record of Decision documenting the selection of an alternative to be implemented will be signed. After the NPS publishes a

notice in the Federal Register announcing the availability of the signed Record of Decision, the implementation of the alternative selected in the Record of Decision can begin.

OTHER CONSULTATION

Consultation and coordination with local and federal agencies and various interest groups was conducted during the NEPA process to identify issues or concerns related to protected species management within the recreation area.

U.S. Fish and Wildlife Service

The NPS began coordination with the USFWS in 2009. After a series of informational consultation meetings, the NPS submitted a biological assessment to the USFWS Arlington Texas Ecological Services Field Office and requested formal consultation on November 25, 2013. The Arlington Texas Ecological Services Field Office provided the NPS with a draft biological opinion on April 9, 2014, and a final biological opinion on April 24, 2014 (USFWS 2014). See attachment 1 of appendix B.

Texas Historical Preservation Office

On July 1, 2014, the NPS sent a letter to the Texas Historical Preservation Officer requesting concurrence that there would be no adverse impacts to historic properties from implementation of the proposed action. The Texas Historical Preservation Officer provided concurrence on July 23, 2014. See attachment 1 of appendix B.

Tribal Consultation

The tribes listed in the section “Agencies, Organizations, and Individuals Consulted” were sent a Notice of Intent letter to initiate government-to-government consultation under Executive Order 13175. Of the 10 letters sent, no responses were received. These tribes were also contacted as part of government–to-government consultation when the draft plan/EIS was released. No comments were received from the Tribes on the draft plan/EIS.

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED

The following governmental, tribal, and private groups and individuals were consulted in the development of this plan/EIS.

FEDERAL AGENCIES

- U.S. Fish and Wildlife Service
- National Park Service, River, Trails, and Conservation Assisting Program, Santa Fe, New Mexico

STATE AND LOCAL GOVERNMENTS

- Texas Parks and Wildlife Department
- Texas Historical Commission

AFFILIATED NATIVE AMERICAN GROUPS

- Apache Tribe of Oklahoma
- Caddo Nation of Oklahoma

- Comanche Nation
- Cheyenne-Arapaho Tribe of Oklahoma
- Delaware Nation of Oklahoma
- Fort Sill Apache Tribe of Oklahoma
- Jicarilla Apache Nation
- Kiowa Indian Tribe of Oklahoma
- Mescalero Apache Tribe
- Wichita and Affiliated Tribes

ORGANIZATIONS/OTHER

- High Plains Off-road Association
- Oklahoma Cross Country Racing Association
- Texas Off-road Association (TORA)
- Wildlands CPR
- Libraries, newspapers, and other media

CONGRESSIONAL DELEGATES

- U.S. Senator John Cornyn
- U.S. Senator Ted Cruz
- U.S. Representative District 13 William “Mac” Thornberry

LIST OF PREPARERS AND CONSULTANTS

Name	Title	Experience	Responsibility
National Park Service, Lake Meredith National Recreation Area			
Robert Maguire	Superintendent	Thirty-two years with the NPS, 11 of those years as Chief Ranger; has worked at 9 national parks and monuments throughout the country. BS in Park and Recreation Administration from Colorado State University	Overall review and development of the plan/EIS
Cindy Ott-Jones	Former Superintendent	Thirty-three years with the NPS, 9 of those years as a national park superintendent; has worked in 9 national parks and monuments throughout the country BS in natural resource management from Kansas State University	Overall review and development of the plan/EIS
Arlene Wimer	Chief of Resource Management	Twelve years with the NPS, 5 years as an independent biological monitor for the state of Texas in the oil and gas industry BS in biology, MS in environmental science	Overall review and development of the plan/EIS, with emphasis on natural and cultural resources
Paul Jones	Chief Ranger	Responsible for oversight of the law enforcement program at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument; has over 14 years in the ranger ranks with the NPS, 5 of those years as Chief Ranger; worked in five national parks and monuments throughout the country Degree in engineering and criminal justice	Park operations, law enforcement, document review
National Park Service, Environmental Quality Division			
Lindsay Gillham	Project Manager/ Environmental Protection Specialist	Twelve years of NEPA experience BS in natural resources recreation tourism; JD	Project management, document review, NEPA compliance
National Park Service, Intermountain Region			
Chris Turk	Former Regional Environmental Coordinator	Thirty-three years in the NPS BAAS in biological sciences	Regional coordination and review of documents.

Name	Title	Experience	Responsibility
The Louis Berger Group			
Lori Fox, AICP	Project Manager / Senior Planner	Master's in community planning; BS in environmental planning	NEPA compliance, document oversight and review, development of purpose, need, objectives, and alternatives, review of resource specialist sections
Nancy Van Dyke	Senior Consultant / Quality Assurance / Quality Control	MS in environmental sciences; BA in biology and geography	Quality control review
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Megan Blue-Sky	Environmental Planner/GIS	BA in geography	Visitor use and experience / health and safety; Lake Meredith National Recreation Area management and operations; mapping
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Lucy Bambrey	Former Senior Archeologist	MA in anthropology; BA in sociology; paralegal certificate	Archeological resources
David Plakorus	Environmental Planner	Master's in urban and regional planning; MBA; BA in history	Vegetation
RTI International			
Carol Mansfield	Senior Economist	PhD in economics	Socioeconomic analysis
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2009b Personal communication via telephone with Doug Wetmore, The Louis Berger Group, Inc., re: invasive species control methods and trails. July 23, 2009.

2010a Personal communication via phone with Lia Peckman, The Louis Berger Group, Inc., re: fish and other wildlife at Lake Meredith National Recreation Area. January 20, 2010.

2010b Personal communication via email with Lia Peckman, The Louis Berger Group, Inc., re: fish in Rosita Flats and Blue Creek areas. January 25, 2010.

2010c. Personal communication with Megan Blue-Sky, The Louis Berger Group, Inc. October 18, 2010.

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1998 *The Mammals of Lake Meredith National Recreation Area and Adjacent Areas, Hutchinson, Moore, and Potter Counties, Texas*. Occasional Papers 174. March 17, 1998. Museum of Texas Tech University.

GLOSSARY

action—Any federal activity including, but not limited to, acquiring, managing, and disposing of federal lands and facilities; facilitating human occupation or visitation; providing federally undertaken, financed, or assisted construction and improvements; and conducting federal activities and programs affecting land use, including, but not limited to, water and related land resources planning, and regulating and licensing activities.

action alternative—An alternative that proposes a different management action or actions to address the purpose, need, and objectives of the plan; one that proposes changes to the current management. Alternatives B, C, and D are the action alternatives in this planning process. See also *no-action alternative*.

adult—An organism that is fully grown or developed and capable of sexual reproduction.

affected environment—Existing natural, cultural, and social conditions of an area that are subject to change, both directly and indirectly, as a result of a proposed human action.

alternatives—Sets of management elements that represent a range of options for how or whether to proceed with a proposed action. An environmental assessment or environmental impact statement analyzes the potential environmental impacts of the range of alternatives, as required under National Environmental Policy Act (NEPA).

appropriate use—A use that is suitable, proper, or fitting for a particular park, or to a particular location within a park.

archeological resource—Any material remains or physical evidence of past human life or activities which are of archeological interest, including the record of the effects of human activities on the environment. An archeological resource is capable of revealing scientific or humanistic information through archeological research.

anthropogenic—Resulting from the influence or actions of human beings.

A-weighted decibel (dBA)—A unit of measure for relative sound intensity as experienced by the human ear. See also *decibel (dB)*.

code—A grouping public comments centered on a common subject. The codes were developed during the scoping process and were used to track major subjects.

comment—A comment is a portion of the text within a correspondence that addresses a single subject. It could include such information as an expression of support or opposition to the use of a potential management tool, additional data regarding the existing condition, or an opinion debating the adequacy of an analysis.

compaction—The process by which a sediment progressively loses its porosity due to the effects of loading. This forms part of the process of lithification. When a layer of sediment is originally deposited, it contains an open framework of particles, with the pore space usually being filled with water. As more sediment is deposited above the layer, the effect of the increased loading is to increase the particle-to-particle stresses, resulting in porosity reduction primarily through a more efficient packing of the particles and to a lesser extent through elastic compression and pressure solution.

compendium—See *Superintendent's Compendium*.

concern—Concerns are statements that summarize the issues identified by each code. Each code was further characterized by concern statements to provide a better focus on the content of comments. Some codes required multiple concern statements, while others did not.

conserve—To protect from loss or harm; preserve. Historically, the terms conserve, protect, and preserve have come collectively to embody the fundamental purpose of the NPS—preserving, protecting and conserving the national park system.

correspondence—A piece of correspondence is the entire document received from a commenter. It can be in the form of a letter, email, written comment form, note card, open house transcript, open house flip chart or petition.

Council on Environmental Quality (CEQ)—Established by Congress within the Executive Office of the President with the passage of the National Environmental Policy Act of 1969. The CEQ coordinates federal environmental efforts and works closely with agencies and other White House offices in the development of environmental policies and initiatives.

cumulative effect or impact—The impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.6).

decibel (dB)—A unit of measure of sound intensity.

ecology—The pattern of relations between organisms and their environment.

ecosystem—A natural unit consisting of all plants, animals, and micro-organisms (biotic factors) in an area functioning together with all of the physical (abiotic) factors of the environment, considered as a unit. Ecosystems can be permanent or temporary. An ecosystem is a unit of interdependent organisms that share the same habitat. Ecosystems usually form a number of food webs.

enabling legislation—National Park Service (NPS) legislation setting forth the legal parameters by which each park may operate.

endangered species—"Any species (including subspecies or qualifying distinct population segment) that is in danger of extinction throughout all or a significant portion of its range (ESA Section 3(6))." The lead federal agency, U.S. Fish and Wildlife Service (USFWS), for the listing of a species as endangered is responsible for reviewing the status of the species on a five-year basis.

Endangered Species Act (ESA) (16 USC 1531 et seq.)—An act to provide a means whereby the ecosystems on which endangered species and threatened species depend may be conserved and to provide a program for the conservation of such endangered and threatened species.

environment—The sum total of all biological, chemical, and physical factors to which organisms are exposed; the surroundings of a plant or animal.

environmental assessment (EA)—An environmental analysis prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require a more detailed environmental impact statement (EIS).

environmental consequences—The environmental effects of project alternatives, including the proposed action, any adverse environmental effects which cannot be avoided, the relationship between short-term uses of the human environment, and any irreversible or irretrievable commitments of resources that would be involved if the proposal should be implemented (40 CFR 1502.16).

environmental impact statement (EIS)—A detailed NEPA analysis document that is prepared, with extensive public involvement, when a proposed action or alternatives have the potential for significant impact on the human environment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed project or action.

erosion—Removal of surface material from the earth's crust, primarily soil and rock debris, and the transportation of the eroded materials by natural agencies from the point of removal.

executive order—An official proclamation issued by the president that may set forth policy or direction or establish specific duties for federal agencies in connection with the execution of federal laws and programs.

fauna—All the animal life of any particular region or time.

Federal Register—Published by the Office of the Federal Register, National Archives and Records Administration, the Federal Register is the official daily publication for rules, proposed rules, and notices of federal agencies and organizations, as well as executive orders and other presidential documents (http://www.gpoaccess.gov/fr/).

federally listed endangered species—An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. Before a species can receive protection under the ESA, it must first be placed on the federal list of endangered species. All actions leading up to and including the listing of a species as endangered are published in the Federal Register (USFWS Endangered Species Program).

habitat—The environment in which a plant or animal lives (includes vegetation, soil, water, and other factors).

herbaceous—Characteristic of a non-woody herb or plant part

invasive species—Nonnative species that disrupt and replace native species.

migratory—Moving from one spatial unit to another periodically, usually for feeding or breeding purposes.

mitigation—Defined in NPS Director's Order 12 as a modification of the proposal or alternative that lessens the intensity of its impact on a particular resource. The definition references 40 CFR 1508.20, which states that mitigation can include

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

monitoring—A process of collecting information to evaluate if an objective and/or anticipated or assumed results of a management plan are being realized (effectiveness monitoring) or whether implementation is proceeding as planned (implementation monitoring).

National Register of Historic Places (National Register)—A register of districts, sites, buildings, structures, and objects important in American history, architecture, archeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the National Historic Preservation Act of 1966, as amended.

NEPA process—The objective analysis of a proposed action to determine the degree of its impact on the natural, physical, and human environment; alternatives and mitigation that reduce that impact; and the full and candid presentation of the analysis to, and involvement of, the interested and affected public – as required of federal agencies by the National Environmental Policy Act of 1969.

no-action alternative—The alternative in which baseline conditions and trends are projected into the future without any substantive changes in management (40 CFR 1502.14(d)). Alternative A is the no-action alternative in this planning process.

nonnative species—Any introduced plant, animal, or protist (tiny life forms that are neither plant nor animal) species that is not native to the area and may be considered a nuisance.

off-road vehicle (ORV)—Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain, with the following exclusions: this term excludes (a) any registered motorboat; and (b) any fire, military, emergency, or law enforcement vehicle when used for emergency purposes, and any combat or combat support vehicle when used for national defense purposes.

Organic Act (NPS)—The 1916 law (and subsequent amendments) that created the National Park Service (NPS) and assigned it the responsibility of managing the national parks.

ORV route—A designated location, typically linear in nature (e.g., from point A to point B), where ORV travel may be authorized by the superintendent, but which may be temporarily closed to ORV use to protect park resources, provide for visitor safety, or prevent user conflicts.

park—Any one of the hundreds of areas of land and water administered as part of the national park system. The term is used interchangeably in this document with “unit,” “park unit,” and “park area.”

planning—An interdisciplinary process for developing short- and long-term goals and alternatives for visitor experience, resource conditions, projects, facility type and placement, and other proposed actions.

pollutants—Contaminants introduced into an environment that cause instability, disorder, harm, or discomfort to the ecosystem (i.e., physical systems or living organisms). Pollution can take the form of chemical substances or energy, such as noise, heat, or light. Contaminants, the elements of pollution, can be foreign or naturally occurring substances or energies; when naturally occurring, they are considered pollutants when they exceed natural levels.

population (or species population)—A group of individual plants or animals that have common characteristics and interbreed among themselves and not with other similar groups.

preferred alternative—The alternative in an environmental assessment or EIS that the agency believes would best fulfill the purpose of and need for action.

preserve—To protect from loss or harm; *conserve*. Historically, the terms preserve, protect and conserve have come collectively to embody the fundamental purpose of the NPS—preserving, protecting and conserving the national park system.

riparian—Of, relating to, or located on the banks of a natural watercourse (as a river or stream), or sometimes of a lake or a tidewater.

route—See *ORV route*.

scoping—An early and open process for determining the extent and variety of issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7).

sediment—Any particulate matter that can be transported by flow and that eventually is deposited. Sediments are most often transported by water (fluvial), wind (eolian), and glaciers (glacial). Beach sands and river channel deposits are examples of fluvial transport and deposition, although sediment also often settles out of slow-moving or standing water in lakes and oceans.

soundscape (natural)—The aggregate of all the natural, nonhuman-caused sounds that occur in parks, together with the physical capacity for transmitting natural sounds.

substrate—The earthy material that exists in the bottom of a marine habitat, like dirt, rocks, sand, or gravel.

superintendent—The senior on-site NPS official in a park. Used interchangeably with “park superintendent,” “park manager,” or “unit manager.”

Superintendent’s Compendium—A document, updated yearly, that provides a list of the special designations, closures, public use limits, permit requirements, and other restrictions under the discretionary authority of the superintendent in a park unit, as provided for in 36 CFR 1.7(b).

threatened or endangered species—Plants or animals that receive special protection under federal or state laws, including the Endangered Species Act. Species may be listed as threatened or endangered in the state, but not by the federal government (USFWS), or vice versa. Some USFWS regional offices also maintain a list of those species of special concern, either nationally or locally, which may be being or may have been previously considered for listing as threatened or endangered.

unacceptable impacts—Impacts that, individually or cumulatively, would

- Be inconsistent with a park’s purposes or values, or impede the attainment of a park’s desired future conditions for natural and cultural resources as identified through the park’s planning process.
- Create an unsafe or unhealthful environment for visitors or employees.
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values.

- Unreasonably interfere with
  - Park programs or activities.
  - An appropriate use.
  - The atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations in the park.
  - NPS concessioner or contractor operations or services.

visitor—Anyone who physically visits a park for recreational, educational, or scientific purposes, or who otherwise uses a park's interpretive and educational services, regardless of where such use occurs (e.g., through Internet access or at a library).

visitor experience—The perceptions, feelings, and reactions a park visitor has in relationship with the surrounding environment.

visitor use—The types of recreation activities engaged in by visitors, including the type of activity, visitor behavior, timing, and distribution of use.

winch—A stationary motor-driven or hand-powered machine used for hoisting or hauling, having a drum around which is wound a rope or chain attached to the load being moved (e.g., off-road vehicle). In the context of this planning process, a winch point is a location in the recreation area where a winch is set up to assist vehicles that may be stuck.

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Appendices

APPENDIX A: LITERATURE REVIEW

SUMMARY OF RESEARCH ON MOTORIZED VEHICLE USE

While access to public lands improves the experience of ORV users, it can damage air and water quality as well as soils; adversely affect vegetation, wildlife, and habitat; impact cultural resources; detract from other visitors' enjoyment of public lands; and create law enforcement issues. In general, air and water quality are negatively affected by exhaust fumes, oil, dust, and siltation that result from ORV use (Taylor n.d.; Proescholdt 2007; Ouren et al. 2007). ORVs churn up and damage delicate soils, and continued use of certain areas can result in soil compaction that prohibits the establishment of annual plants and can foster the invasion of nonnative species into fragile ecosystems (Proescholdt 2007; Ouren et al. 2007; Webb 1982). Soil damage and compaction can also lead to increased erosion of ORV traffic areas expressed by deep gullies and high stream siltation (Iverson 1980). An analysis of ORV impacts in national park units (Long et al. 1999) found this type of recreation causes damage to topsoil as well as vegetation and has in some places resulted in the mortality of endangered species. Park rangers have also reported incidents where ORV use has destroyed or disturbed cultural resources that parks are bound by law to protect (Long et al. 1999). Additionally, loud engines in quiet environments disturb wildlife and affect visitor enjoyment for those that use parks as places of peace and solace or for activities such as hunting and fishing (Proescholdt 2007). While Long et al. (1999) found that there is widespread legal use of ORVs in 23 park units, they found illegal use in 40 park units.

This literature review has been prepared to support the development of an ORV management plan/EIS at Lake Meredith National Recreation Area. The following sections summarize available information related to the potential effects of ORV use on natural and cultural resources, such as air and water quality, soils, vegetation, wildlife, and archeological resources, found in national park units. It also examines information on the effects of ORV use on socioeconomics, esthetics/sound, safety, and management issues. Because the national recreation area is located within a semiarid region, the literature review focused on mountainous, semiarid, and desert environments, where appropriate.

AIR QUALITY

While emissions from on-road vehicles decreased 56 percent from 1986 to 2006 as a result of emissions reduction programs, there was a 42 percent increase in ORV emissions over the same period. Annual estimates show that ATVs emit more than 381,000 tons of hydrocarbons, 1,860,000 tons of carbon monoxide, and 11,000 tons of nitrogen oxide each year across the country (Wildlands CPR 2006). A recent report from the Center for Biological Diversity (Kassar and Spitler 2008) cites the California Air Resources Board finding that off-road motorcycles and ORVs produce 118 times as much smog-forming pollutants as do modern automobiles on a per-mile basis. One study prepared for the Bureau of Land Management (BLM) in California showed that the impacts of fugitive dust (particulate matter) created during the operation of ORVs varied as a function of activity levels (WESTEC 1979). In some instances, fugitive dust levels that were 10 times the daily standard and 100 times the hourly standard were found to occur in localized areas. As a result, the study recommended adequate separation of ORV use from non-ORV related receptors to properly reduce the effects of fugitive dust emissions (WESTEC 1979). If left uncontrolled, it is estimated that ORVs will contribute 33 percent of hydrocarbon emissions, 9 percent of carbon monoxide, 9 percent of nitrogen oxide, and 2 percent of particulate emissions nationally by 2020 (Wildlands CPR 2006).

Overall, from the perspective of human health, studies have shown that ORVs emit carbon monoxide, nitrogen oxide, benzene, toluene, ethylbenzene and xylenes. Carbon monoxide exposure has been shown to lead to visual impairment, reduced work capacity and mental dexterity, poor learning ability, nausea, headaches, dizziness, and death. Nitrogen oxides can cause shortness of breath, chest pain and increased susceptibility to respiratory infections. Benzene is an identified carcinogen. Toluene, ethylbenzene, and xylenes can cause dizziness, headaches and loss of consciousness (Wildlands CPR 2006). Particulate

matter (in the form of fugitive dust from unpaved roadways) is another air pollutant which can lead to decreased lung function, respiratory disease, and even death (Wildlands CPR 2006).

WATER QUALITY

A total of six articles were reviewed regarding water quality impacts associated with ORV use. Five of the articles involved specific scientific studies, and one article (Wildlands CPR 1999) presented legal strategies for activists to address inappropriate roads and ORVs through tools provided in four regulatory areas of the *Clean Water Act*: state water quality plans, total maximum daily loads, discharge permits, and Section 404.

Of these articles, two documented the impacts on water quality directly related to the use of motorized vehicles in or near aquatic environments. The Texas Chapter of the American Fisheries Society (TCAFS) cites the erosion, siltation, and bank destabilization that results from ORV use and increases the potential for other water quality impacts. The damage to stream bottoms and increased siltation can change stream temperatures, resulting in increased extremes and temperature variability that can be detrimental to fish populations (TCAFS 2002). In the July 2000 article in the U.S. Forest Service (USFS) Stream Systems Technology Center's "Stream Notes" magazine, Furniss et al. (2000) determined that forest roads and associated drainage features caused an increase in channelized runoff that often reached local waterways prior to infiltration, which demonstrated a hydrologic connection between roads and streams. This report was based on several studies in the Pacific Northwest that documented increases in runoff timing, peak flows, and sedimentation in streams caused by concentrated outflows from ditches and culverts associated with forest roads. The authors determined that this hydrologic connection between roads and streams indicated the potential for impacts on water quality, aquatic habitats, and hydrology (Furniss et al. 2000).

SOILS

Several studies show that ORV use in desert climates can have lasting, deleterious effects on soil stability and fertility. In one study, researchers drove a four-wheel-drive vehicle back and forth twice across test plots in the southern Colorado Plateau, Sonoran Desert, Mojave Desert, Chihuahuan Desert, the northern Colorado Plateau, and the Great Basin Desert. They found statistically significant reduction in soil nitrogenase activity in nearly half of the test sites (Belnap 2002). Nitrogenase activity results from an enzyme that catalyzes nitrogen fixation, which contributes to soil fertility and productivity.

In desert climates, biological soil crusts are often primary contributors to soil fertility, stability, and primary productivity due to the nitrogenase activity of soil lichens, cynobacteria, and moss (Belnap 1996, 2002). Soil composition is an important indicator of the presence of different types of biological organisms—sandy and clay soils being less hospitable to these organisms than those higher in silt content (Belnap 2002). The presence of these organisms before disturbance does influence the degree to which soils are injured by ORV disturbance and should be considered when estimating the damage caused by ORVs.

Similarly, desert type also appears to determine the impact that ORV disturbance will have on the nitrogenase activity of those organisms. For instance, Belnap (2002) found that biological soils in hot deserts (e.g., Chihuahuan, Sonora, and parts of the Mojave) recovered more quickly from disturbance than those in cooler deserts (e.g., Colorado Plateau, northern Great Basin) due in part to the type of soil lichens found in those soils as a result of climate. Moreover, the presence of more soil lichens before the disturbance significantly reduced the impact on nitrogenase activity after the disturbance. Although desert type can affect the degree of impact, any disturbance by ORVs damages fragile biological soil crusts, and recovery can take decades or even centuries depending on the soil type (Belnap 1993, 2003; Webb and Wilshire 1980). In their study on a ghost town in Nevada, Webb and Wilshire (1980) found that a half

century after the site was abandoned, soils had still not recovered. Moreover, the type of vegetation found at the research site differed significantly from surrounding undisturbed areas, pointing to the impacts that soil disturbance had on other biological organisms.

In addition to reduction in primary productivity though decreasing nitrogenase activity, soil compaction is another byproduct of ORV use that can have negative impacts on desert ecology. Compacted soils can impede the establishment of plants by inhibiting root expansion. Results from a study by Adams et al. (1982) in the Mojave Desert showed that soil compaction as a result of ORV use is more pronounced on wet soils than dry soils. Under wet conditions, just three ORV passes over a study area resulted in statistically significant soil strengthening to a depth of 25 centimeters. With dry soils, similar results were not achieved until a Ford Bronco had completed 20 passes and only at a depth of 15 centimeters. These results indicate that controlling ORV activity under moist and wet conditions could reduce soil compaction and thus ecosystem injury.

Another study in the Mojave Desert (Iverson 1980) showed that soil compaction can lead to soil erosion, largely because of decreased infiltration rates of rainwater. Tuttle and Griggs (1987) documented erosion of ORV-compacted soils in state vehicular recreation areas located in arid regions of California, including gullies and increased stream sediments at various hillclimbs. Webb (1982) found that soil compaction in Mojave Desert soils resulted from a minimal number of motorcycle passes and that after as few as ten, all annual vegetation was destroyed. Loamy sand soils appeared particularly vulnerable, and Webb recommended ORV traffic be prohibited from areas with those soil types. At a minimum, partial recovery of the tests sites from his study became apparent only after one year, and it was attributed to invasive species.

VEGETATION AND INVASIVE SPECIES

There are numerous studies describing the impacts of ORVs on vegetative communities, including direct damage to vegetation by vehicle use and the spread of invasive species by vehicular seed dispersal. Three studies reviewed involved direct examination of vehicles to determine if they were potential distributors of nonnative plant seeds.

Osborn et al. (2002) discuss a study that investigated the potential for seed transport into Kakadu National Park in Australia by means of tourist vehicles. The study concluded that vehicles were partially responsible for weed seed dispersal, but the low density of seeds found on the vehicles did not warrant the park taking preventative action. Another study (Rooney 2005) compared soil samples taken from the undercarriage of ORVs to field surveys for seven invasive species in forested areas of Wisconsin. No evidence of actual invasive plant dispersal was noted; however, because invasive plants have seed traits that predispose them to dispersal, the study found that ORVs may occasionally contribute to long distance dispersal events. This is further supported by a study conducted by the Montana Weed Control Association (Trunkle and Fay 1991) which involved driving a vehicle 40 feet into a vegetated plot and then to various distances from the plot. Afterwards, plant material, including spotted knapweed (*Centaurea stoebe*) seeds, was collected from the undercarriage. The results indicate that spotted knapweed seed is readily disseminated by motor vehicles for long distances.

Two studies reviewed addressed the effects of roads on the spread of invasive species. Gelbard and Belnap (2003) documented that roads and associated environmental disturbances contributed to the spread of invasive species in semiarid grasslands, shrublands, and woodlands of southern Utah. This study also noted evidence of higher nonnative species richness and invasive species cover near paved roads than near four-wheel-drive vehicle tracks. A study from southern Nevada (Bolling and Walker 2000) explained how the initial form of disturbance in creating roads could be a factor in determining the forms of plant succession that occur during revegetation of disturbed areas. Soils and vegetation types in southern

Nevada differed between roads and nearby non-road areas and between roads created by vehicular traffic (track) and bulldozing (bladed). Track roads were more susceptible to soil compaction and had higher levels of organic matter and plant cover (Bolling and Walker 2000).

A study of nine ORV use areas in California deserts (Lathrop 1983) found that direct vehicle impacts constituted the primary means of vegetative destruction. The study showed that areas beyond the vehicle track width were also affected although the degree of impact varied with conditions and intensity of vehicle use. The study demonstrated that concentrated current or recent use in localized areas (such as heavy weekend use) created the greatest reduction in vegetative cover. Another study in the Mojave and Colorado deserts of California (Lovich and Bainbridge 1999) found that natural recovery rates (return to pre-disturbance levels of biomass, cover, density, community structure, and soil characteristics) for certain desert ecosystems from the negative impacts of ORVs and other uses could be as long as 3,000 years. Wilshire (1983) found that even a single pass of an ORV could destroy many types of annual and some perennial plants although hundreds of passes may be required to destroy tough, deep-rooted shrubs. Webb (1983) found that while most of the annual vegetation in a Mojave Desert study remained after one pass by a motorcycle, most had been destroyed after 10 passes. Wilshire, Shipley and Nakata (1978) documented the impacts of ORVs in western states, including trail widening, uprooting of vegetation, burying plants, severe erosion, runoff, and the consequences of each to vegetation. Another study (Nakata 1979) investigated the causes of damage from a particular storm event in Utah and found that several factors contributed to the development of a storm-induced mudflow, including erosion and channelization of runoff along ORV trails that combined with diverted canal water. Nakata concluded that major destabilized areas above the canal were stripped of vegetation by ORV use.

FISH AND WILDLIFE

Numerous studies have detailed the impacts on wildlife of ORV use on public lands. Impacts generally described in these studies include direct mortality, harassment, noise effects, and habitat destruction. For example, desert tortoises (*Gopherus agassizii*) and other amphibians and reptiles have been crushed to death or injured by this type of traffic in public lands (Bury and Luckenbach 2002). Other risks include injury during escape responses, and in severe cases, habitat avoidance and abandonment of young. Radle (2007) found that wildlife generally experience an increase in heart rate, as well as altered metabolism and hormone balance, when introduced to human-made noise. Noise from ORVs can obstruct the senses of animals that depend on hearing and vibration detection to survive (Berry 1980; Bury 1980). ORVs also impact wildlife by destroying or fragmenting habitat. Much of the existing research has dealt specifically with the effects of erosion and trampling of vegetation by visitors and the associated impacts on wildlife habitat values (Joslin and Youmans 1999; Monz et al. 2003). This has led some to conclude that the most effective strategies for avoiding habitat disturbance are outright road removal and the avoidance of new road construction in roadless or sparsely roaded areas (Trombulak and Frissell 2001; Walder n.d.).

Among bird species, adverse reactions to human recreational activities have included nest desertion, temporary nest abandonment, and changes in foraging habits (Joslin and Youmans 1999). Studies of wintering raptors in Colorado have found that perching distances and species richness were greater at nest locations away from trails, suggesting that trails may have an effect on habitat selection (Fletcher et al. 1999). As a result, spatial buffer zones (0.4 to 1.2 kilometers from nests) for ORV use in the Rocky Mountains are recommended during sensitive nesting phases (Joslin and Youmans 1999).

ORV-related impacts on amphibian and reptile species identified in Montana include direct mortality from vehicle collisions as well as indirect impacts on populations via the creation of migration barriers, habitat destruction, and increasing chemical contamination and sedimentation. The development of recreational facilities and water impoundments may result in the loss of key breeding, foraging, and wintering habitats, while ORV-related noise has resulted in decreased acoustical sensitivities in a number

of lizard species in the Sonoran Desert (Joslin and Youmans 1999). Species-specific studies have shown that certain species of reptiles in the Mojave Desert region of California vary in body mass depending on the level of ORV impacts, with reptiles in lower impact areas showing higher body mass (Nicolai and Lovich 2000; McGrann et al. 2006). These studies also noted that availability of primary food sources in high impact areas was lower than in low impact areas. Reptiles studied in Owyhee County, Idaho, exhibited reduced rates of movement following disturbance from ORVs. For example, reptiles have been found in higher densities further from trails at sites used less frequently by ORVs, while higher densities were observed closer to trails at more heavily used sites (Munger et al. 2003).

Studies of ORV impacts on mammalian species have shown that disturbance responses depend on the species, the extent of disturbance, and a multitude of other factors such as individual habituation. Related stressors include lowered resistance, inhibition of reproductive functions, behavioral disturbances, and greater energy demands due to flight responses, particularly from motorized recreationalists during winter months (Boyle and Samson 1985; Caslick and Caslick 1997; Wisdom et al. 2004).

Adverse effects on small mammals from ORV use have also been documented and include population reduction, energy expenditure, habitat modification (including changes in microclimate), forage/cover removal, and echolocation interference (Joslin and Youmans 1999). Further research on the effects of recreational disturbances on ungulates, such as deer (*Odocoileus* spp.) and elk (*Cervus canadensis*), has shown that even when disturbances do not induce an overt behavioral response, the increased heart rates can result in relatively high energy expenditures (Joslin and Youmans 1999). Black et al. (n.d.) also explain how disturbances contribute to increased energy expenditures for wildlife and describe various animals' means of thermal regulation (maintaining body temperature) during winter months.

These authors state that of the three learned responses that wildlife may show to recreationists (habituation, attraction, and avoidance), avoidance is particularly important in the Gunnison Basin of southwestern Colorado where animals have learned to flee from hunters. An example of this has been the propensity of bighorn sheep (*Ovis canadensis*) to abandon traditional ranges and alter social patterns as a response to these disturbances (Black et al. n.d.). It has been reported that any human activity on bighorn sheep winter range, especially within 100 feet of escape terrain, could affect their survivability (Caslick and Caslick 1997). By contrast, an earlier study by MacArthur et al. (1982) found that domestic sheep in Alberta, Canada that were regularly exposed to human activities had elevated heart rates when they were in the presence of humans accompanied by dogs. However, their reactions to road traffic were minimal, suggesting some degree of habituation.

One particular study demonstrated that ORV use in aquatic communities had a simplifying effect on aquatic biota. Some species were unable to adapt and disappeared from the modified environment (TCAFS 2002) primarily due to the impacts of vegetation loss and resulting water quality impacts.

ARCHEOLOGICAL RESOURCES

Whether intentionally or inadvertently, ORV use has the potential to affect archeological resources on public lands (BLM 2000; Lyneis et al. 1980; Schiffman 2005; Sowl and Poetter 2004; SUWA 2002). Direct impacts result from the damage or destruction that occurs when ORVs drive over and/or near archeological sites. The weight and torque of such vehicles easily damages fragile surface deposits. The Southern Utah Wilderness Alliance (2002) has cited cases in which the associated soil compaction, vegetation loss, and altered hydrology cause the compaction of surface and subsurface features (e.g., remains of houses, burials, hearths, storage pits, etc.) as well as breakage of artifacts. Site integrity, a necessary element for listing a cultural resource in the National Register of Historic Places, is also affected by the visible changes caused by vehicle tracks and erosion (Sowl and Poetter 2004). Lastly,

impacts occur when vibrations and soil erosion caused by ORVs undermine the stability of fragile prehistoric structures (SUWA 2002).

One study in the Izembek National Wildlife Refuge in Alaska noted that increased erosion from ORVs exposed artifacts, making them susceptible to collection (Sowl and Poetter 2004). Studies conducted in the California desert note that ORVs provide access to previously inaccessible, remote areas as ORV users explore new terrain (Lyneis et al. 1980). According to the BLM, this leads to an increase in visitation to lands previously used only by small numbers of hikers and increases the intentional and inadvertent damage of archeological resources through surface disturbances (BLM 2000), as described above. In Alaska, it has been shown that damage from such access increases dramatically when the areas are remote enough to preclude monitoring (Sowl and Poetter 2004).

ORVs have also enabled collectors and pothunters to reach these remote areas, facilitating greater archeological resource damage from intentional collection and vandalism (BLM 2000; Schiffman 2005; Lyneis et al. 1980; SUWA 2002). In addition, one study in the California desert notes that ORVs increase the ability of collectors to carry larger and heavier artifacts out of an area (Lyneis et al. 1980).

SOCIOECONOMICS

ORV-related economic impacts vary by state and region. A 2008 study commissioned by the Iowa State ORV Association to investigate statewide ORV use patterns and expenditures found that the most frequent type of ORV use consists of day trips within the vicinity of users' homes, but about 41 percent of ORV owners in Iowa make an average of 1.7 out-of-state trips annually for recreation purposes (Otto 2008). The study used the IMPLAN economic modeling tool to create a user profile and estimate ORV-related statewide income and employment. It found that Iowa ORV users, a group that includes 29,663 households, spend an estimated $86.4 million per year on ORV equipment and activities, resulting in an estimated total of $126 million in in-state transactions or sales, $33.7 million in personal income, and 1,200 jobs. The study also found that Iowa ORV users generate an estimated total $6.3 million in out-of-state transactions (Otto 2008).

Reed and Hass (1989) indicate that the profile of the ORV economy in Colorado is even more pronounced, with an estimated $489 million (in 1989 dollars) spent by ORV users statewide for ORV-related equipment, activities, and services. In 1988, approximately 192,400 ORV users in Colorado accounted for an estimated 1.3 million ORV recreation trips. The 600 ORV users surveyed in the Reed and Hass study would be willing to pay, on average, $19 (in 1988 dollars) for an annual ORV registration fee if the revenues were collected to enhance statewide ORV opportunities, such as trail construction, maintenance, and educational programs.

A more recent survey-based study of ORV recreational use on the Colorado economy (COHVC 2001) focused on user behavior and average per-trip expenditures and found estimated ORV-related expenditures for households to be between $140 and $159 million in 2000. The estimated value of new recreational vehicle sales in Colorado in 2000 was $67.6 to $74.4 million. There were also indirect contributions to the Colorado state economy (e.g., expenditures for maintenance, repairs, storage, and miscellaneous items). Total employment for ORV-related activities was between 3,196 and 3,515 jobs. The study found that 68 percent of Colorado ATV users would leave the state for such activities if no ORV activities were allowed in state.

Another study of economic impacts of ATVs in Minnesota (Schneider and Schoenecker 2006) found that direct ATV-related expenditures were $641.9 million, with an estimated 5,693 jobs from ATV-related retail and manufacturing activity. Stynes (2000), who looked at ORV use in Michigan, mentions that these socioeconomic effects tend to take place in rural communities with fairly limited economic

development and which rely heavily upon retail and tourism. In his study of ORV spending and economic impact in Michigan, he found that ORV owners spent about $40 million on trail-riding trips outside their region of residence in 1998, supporting about 600 jobs statewide.

A survey of registered Utah ORV users found that the number of registered users tripled in eight years (1998–2006) (Burr et al. 2008). Statewide, respondents are concerned with provision of information, trailhead facilities, maintenance of ORV areas, signage, and enforcement of rules and regulations. Availability of information is the most important among users and is found to be the biggest weakness. Respondents believe that more information should be provided regarding rules, hazards, and conditions via maps, brochures, newsletters, and websites. Concerning fees, Utah users were opposed to an additional statewide tax on the sale of all new ORVs and trailhead parking fees for all users. Respondents were least opposed to daily use fees for heavily used areas (Burr et al. 2008).

In a review of surveys conducted by several leading publications, King (1972) found that motorcycle riders were representative of the wider American society, with the average motorcyclist being in the mid-20s and 20 percent being employed in semi-skilled/skilled professions. King reported that many off-road, trail motorcyclists use forests and parks in other recreational ways, such as for fishing and hunting, and concluded that trail riding is a significant and valuable recreational activity that should be allowed within park units.

Freuh (2001) also found that hunting and fishing constitute the highest recreational interests among ORV users in Colorado. Schneider and Schoenecker (2006) used both survey and secondary data to construct a profile of ATV users. It showed that the 2005 registered ATV rider is a middle-aged, non-Hispanic white male with less than a college education, which is a finding consistent with ATV profiles of riders in Wisconsin, Colorado, and Utah.

ESTHETICS/SOUND

ORV use influences the character of the wild landscape and can result in conflicts between ORV users and other recreational users. McCool (1979) points out that visual impacts last longer in arid environments, where soil stability is inherently more tenuous. The compounding factors of ORV activities, wind erosion, and increased runoff from the resulting loss of vegetation can have major impacts on the esthetic character of such regions.

ESTHETICS

There is a paucity of data regarding ORV use and its impacts on soundscapes in NPS units, with the majority of available data related to air tours over public lands managed by the NPS. Gramann (1999) used many approaches to garner information about how visitor experiences in national parks are affected by mechanical versus natural sound. Overall, results showed that park users identify natural sounds as more enjoyable than mechanical sounds, but mechanical sounds do not always interfere with the user's experience. Visitor experiences and sensitivity to mechanical sound is dependent on visitor expectations, group size, front or backcountry experience, and activity type. For example, a visitor in a group of three or more visiting a park for the first time in the front country and taking pictures may not be as sensitive to mechanical sounds as a lone hiker in the backcountry. People are generally tolerant of certain noise disturbances if they perceive them as necessary (e.g., helicopters conducting fire suppression activities). In this sense, the study indicated that it is important that sounds are consistent with the visual setting within which they are heard.

Variable noise disturbances may be more readily tolerated depending on the perception of the setting by the observer. As a result, from a management perspective, some scenic overlooks and short front country

trails may not require as much protection as backcountry locales where preserving the experience of natural sound is paramount to overall visitor experience (Gramann 1999). It is useful to note that, along with regulatory frameworks, successful management of natural soundscapes must also include compliance assurance. A report from the Motorcycle Sound Working Group of the American Motorcycle Association (2005) points out that while strict U.S. Environmental Protection Agency standards regarding sound output are applied by the manufacturers of ORVs, users often modify vehicles with aftermarket parts that circumvent such regulations.

SAFETY

The 2005 ***Annual Report of ATV-Related Deaths and Injuries*** published by the U.S. Consumer Product Safety Commission (CPSC) reveals that overall, the number of deaths and injuries reported since 1982 has increased. Nationwide, as of the end of 2005, a total of 7,188 deaths had been reported since reporting began in 1982 (Ingle and Streeter 2007). An estimated 137,000 ATV-related emergency room treated injuries have occurred in the same time period. Thirty percent of the total ATV-related deaths were children under 16 years old, and 13 percent were younger than 12. Between 1992 and 2005, there was a 24 percent increase in injuries in the 45–54 age group (Ingle and Streeter 2007).

CPSC first began analyzing data on ATVs in the early 1980s to provide statistics on frequency of deaths and injuries associated with three-wheel ATVs. These data led to a consent decree with CPSC and five ATV distributors that halted the production of three-wheel ATVs, offered training to all new ATV owners, and recommended adult-size ATVs for those 16 and older. The decree expired after 10 years in 1998, but the five original signers, along with two others, agreed to continue with most of the elements under the consent decree of 1988 through voluntary action plans (Ingle and Streeter 2007).

Consumer advocacy groups and petitioners have argued that current industry standards regarding ATV use by children under the age of 16 are not preventing deaths and injuries. In August of 2002, a petition to ban ATV use by children under 16 years old and to provide monetary refunds covering the cost of vehicle purchase for consumers was brought by the Consumer Federation of America and eight other organizations to the CPSC. The organizations included consumer and medical non-profit organizations and environmental, safety, and public interest research groups. The petition stated that ATVs pose unreasonable risk of injury and death to children and referenced the 1988 consent decree described above, pointing out that the decree did not include incentives to encourage owners of three-wheel ATVs to return them to dealers. The petitioners stated that voluntary action plans by manufacturers are inadequate in preventing deaths and injuries to children, and they cited the CPSC conclusion that ATVs are “inherently difficult to operate for adults and [are] beyond the development capability of children to control” (Weintraub 2002). The groups requested more stringent controls for ATV users over the age of 16, including licensing and training.

MANAGEMENT ISSUES

Nationwide, 15 national park system units allow ORV use by the general public. Within these areas, various user groups, as well as ORV manufacturers, contend that NPS limits on ORV use unfairly restrict access, establish a precedent for other federal land managers to impose or extend restrictions, and may be economically harmful to gateway communities and industries serving users (Calvert et al. 2007). Opponents of motorized recreation in national park system units cite ORV use as damaging to the environment and cultural artifacts. Conflicts also arise on USFS lands, where uses such as timber harvesting and ORV recreation may affect birdwatching and sightseeing and can degrade water quality in certain settings (Calvert et al. 2007).

Studies show that ORV use has been increasing throughout the United States. Cordell et al. (2005) report that, according to the Motorcycle Industry Council, ORV annual sales more than tripled between 1995 and 2003, and ATVs represent about 70 percent of all ORVs purchased during that period. In Colorado alone, 26.7 percent of the state's population (more than 4.5 million in 2005) participated in ORV recreation, and Blahna (2006) highlights the current crisis of ORV proliferation and concomitant damage to resources.

A 2001 survey of ORV users in Colorado found that while many trail riders were reportedly knowledgeable of rules and regulations regarding off-trail restrictions, some riders still did not obey regulations (Frueh 2001). In the study, most ORV users admitted to going off trail, but felt that it was okay "just this one time." Adult users reportedly believe that it is their duty to pass on trail ethics to younger riders. Younger users (13–18 years of age) were more concerned with personal safety than environmental concerns. Chavez and Schuett (2005) found while many ORV users felt that humans should be in "harmony with nature," they were not focused on environmental concerns. A quarter of the respondents believed trails should always contain a variety of scenery, be controlled for erosion, and have posted signs at trailheads indicating difficulty and trail length. Most respondents used private lands for recreational riding and national forests second (Chavez and Schuett 2005). A survey of registered ORV owners in Utah found that BLM land was the primary destination for ATV, motorcycle, and 4×4 vehicle trips. Forest Service land was the second most preferred destination. Respondents surveyed reported mixed feelings with regard to law enforcement, with some believing transgressions by ORV users to be of minor concern (Fisher et al. 2001).

A study in Utah aimed at creating an inventory of ORV use occurring in 12 high-use or "hotspot" regions of USFS land found that ORV users had taken excessive measures to access closed routes by moving large boulders, removing posts, chain-sawing trees or logs, or purposefully negotiating terrain to create a new trail around management-placed and/or natural barriers to ORV traffic (Divine and Foti 2004).

The effective implementation and maintenance of successful park travel management plans depends upon adherence to certain design criteria. The Colorado Mountain Club and Wilderness Society (CMCWS 2004) outlines 10 steps to developing a comprehensive travel management plan:

1. Identify recreation and transportation goals for the planning area.
2. Assemble resource data.
3. Identify the baseline travel system.
4. Summarize public recreation desires and current recreational opportunities.
5. Analyze present and predicted future fiscal and personnel resources.
6. Calculate route density and quantify route distribution in comparison to high priority biological, physical, and cultural features.
7. Identify geographic subunits that constitute logical distinct recreation planning areas.
8. Develop management alternatives.
9. Review the final route assessment.
10. Implement the plan and monitor, evaluate, and adjust as needed.

Some monitoring efforts have benefited from the simultaneous observation and data collection of traffic and wildlife made possible by pneumonic road counters and GPS units (USGS 2005). However, Calvert et al. (2007) note that monitoring and enforcement may be impeded in some locations (and especially on BLM lands) due to their remoteness, insufficient signs, and inadequate staff and resources, challenges

which would also be relevant to the NPS. Adaptive management strategies targeted toward the specific needs of individual parks would potentially provide the most efficacy in resource management.

Given the general trend of increasing ORV use, appropriate travel management planning has increased among public agencies and various stakeholder groups. Other federal regulatory requirements concerning the protection of resources also provide guidance for travel management plans. For instance, Section 106 of the National Historic Preservation Act specifically requires that cultural resource information from the planning area's Class I inventory, and other existing cultural resources information, be considered when choosing among the range of possibilities in designating a planning area travel system for proposed designation. Moreover, agencies are required under Section 106 to identify the geographic area or areas within which the character or use of any historic properties may be directly or indirectly affected by an undertaking. Coordination with State Historic Preservation Officers and Indian Tribes prior to initiating the development of a travel management plan is also required (BLM 2006). Yankoviak (2005) argues that such up-to-date policies will provide improved guidance in solving ORV issues on USFS lands. However, challenges to the crafting and implementing of park travel management plans often arise which carry significant implications for the functional management of park resources.

Meyer (2002) prescribes regular trail maintenance and monitoring, including periodic inspections and condition assessments at five-year intervals. In addition, Meyer offers several management approaches that can be implemented to curtail trail degradation, including trail rerouting in cases where numerous segments have been degraded by recreational use; seasonal or type-of-use restrictions in instances when specific seasonal uses may be contributing to greater impacts; trail hardening, which involves the application of amendments to the trail surface; and outright trail closure as a last resort to protect threatened resources. Traffic volume restrictions or "controlled use" is also suggested as a means to prevent significant resource degradation, although enforcement is needed to implement this management strategy (Meyer 2002).

Christensen and Watson (2006) describe challenges resulting from the implementation of the 2006 *Bitterroot National Forest ORV Management Plan*, which included maintaining an up-to-date inventory of routes, working with ORV users to reduce impacts and conflicts, and working with all stakeholders to identify appropriate and acceptable ORV opportunities. Christensen and Watson also cite lessons learned from the USFS policy and experiences of planners nationwide, which suggest that a collaborative process with a "system-wide, forest-level perspective" is likely to be the most appropriate and successful strategy for developing a widely supported ORV travel management plan. Moreover, Christensen and Watson stress ongoing public involvement in ORV planning as being crucial for public acceptance of the resulting plans. In an assessment of the efficacy of such a cooperative effort in four counties in North Central Michigan, Nelson and Lynch (2001) conducted stakeholder interviews, surveys of ORV drivers, and investigations of route signage survival. They found that, after plan implementation, compliance with ORV rules increased as most riders supported the program.

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APPENDIX B: DRAFT ENVIRONMENTAL IMPACT STATEMENT PUBLIC COMMENT SUMMARY REPORT

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INTRODUCTION AND GUIDE

INTRODUCTION

Pursuant to the National Environmental Policy Act (NEPA), its implementing regulations, and National Park Service (NPS) guidance on meeting the NEPA obligations, Lake Meredith National Recreation Area (hereafter "Lake Meredith" or "the recreation area") invited the public to submit comments on the Draft Off-road Vehicle Management Plan / Environmental Impact Statement (draft plan/EIS). This report describes how the NPS considered public comments and provides responses to those comments.

After the Environmental Protection Agency's (EPA) release of the Notice of Availability to prepare the draft plan/EIS, a 60-day public comment period was open between January 25, 2013, and March 26, 2013. This public comment period was announced online (www.parkplanning.gov/lamr), in newspaper articles, through press releases, and through direct mailings.

The draft plan/EIS was made available through several outlets, including the NPS Planning, Environment, and Public Comment (PEPC) website at http://parkplanning.nps.gov/, hardcopies at the recreation area's headquarters, and by request through the mail. After reviewing the draft plan/EIS, the public was encouraged to submit comments about the draft plan/EIS through the NPS PEPC website, by postal mail sent directly to the recreation area, delivered in person directly to the recreation area, or at public meetings. Written comments were accepted during the public meetings on comment forms and on flip charts.

DEFINITION OF TERMS

Primary terms used in the document are defined below.

Code: A code is a grouping centered on a common subject. Codes were developed during the public comment process and were used to track major subjects.

Comment: A comment is a portion of the text in an item of correspondence that addresses a single subject. A comment could include such information as an expression of support or opposition to the use of a potential management tool, additional data regarding the existing condition, or an opinion debating the adequacy of an analysis.

Concern: A concern summarizes the issues or themes identified by each code. Each code is further characterized by concern statements that focus on the content of comments. Some codes require multiple concern statements. In cases where no comments were received about an issue, the issue was not identified or discussed in this report.

Correspondence: An item of correspondence is the entire document received from a commenter. It can be in the form of a letter, written comment form, open house flip chart, or petition.

Representative Quote: Representative quotes are portions of text taken directly from comments received from the public. Representative quotes help clarify the concern statements. Representative quotes are not edited.

All public comments were considered important as useful guidance and input to the public comment process, but only substantive comments were analyzed in the Public Comment Summary Report.

GUIDE TO THIS DOCUMENT

This report is organized as follows.

Content Analysis Report: This basic report generated by PEPC provides information about the numbers and types of comments received, organized by code. Table 1 summarizes the number of correspondences that contained each code. Tables 2 through 5 show general demographic information, such as the states where commenters live and the number of letters received from different organizations.

Comment Response Report: This report summarizes the substantive comments received on the draft plan/EIS. These comments are organized by codes and are further organized into concern statements. Below each concern statement are representative quotes, which have been taken directly from the text of the public's comments and further clarify the concern statements. A response to each concern statement is provided.

Correspondence from Organizations: This table lists all groups that submitted comments, arranged by the following organization types as defined by PEPC (and in this order): recreational groups; state government; federal government; and unaffiliated individuals. Each item of correspondence was assigned a unique identification number upon entry into PEPC. This number can be used to assist the public in identifying how the NPS addressed their comments.

Index by Organization: This index identifies all of the codes that were assigned to each item of correspondence and is arranged by organization type. Individual commenters are also included in this report, identified as unaffiliated individuals.

Index by Code: This index lists which organization or unaffiliated individual commented on which topics, as identified by the codes used in this analysis. The index is organized by code. Under each code is a list of the organizations that submitted comments on the coded topic and the related correspondence number. Entries identified as N/A represent unaffiliated individuals.

Non-substantive Comment Report: This report includes all of the comments received that were categorized as non-substantive.

PUBLIC MEETINGS

Two public meetings were held in March 2013 to provide information about the plan and the alternatives considered, continue the public involvement process, and obtain input on the draft plan/EIS for ORV use at Lake Meredith. The public meetings held during the public comment period for the draft plan/EIS are listed below:

- March 19, 2013: Ashmore Inn and Suites in Amarillo, Texas (33 attendees)
- March 20, 2013: Sanford-Fritch Schools, Business Office, in Fritch, Texas (19 attendees)

A total of 52 meeting attendees signed in during the two meetings. The meetings were conducted in an open house style, in which displays were stationed around the room and the public was able to ask questions. Recreation area staff members were available at the meetings to answer questions and provide additional information to open house participants. The public was encouraged to provide comments at the meeting on flip charts or using a comment card. Participants were also encouraged to provide comments after the meeting using the NPS PEPC website, comment card, or posted letter. Public comments received are categorized in this report.

During the public comment period, 116 pieces of correspondence were entered into the PEPC website. Some comments were entered directly by members of the public, and the NPS or its contractor uploaded hardcopy letters and comment forms sent to the NPS.

THE COMMENT ANALYSIS PROCESS

Comment analysis is a process used to compile and correlate similar public comments into a format that can be used by decision makers and the interdisciplinary team. Comment analysis assists the team in organizing, clarifying, and addressing technical information pursuant to NEPA regulations. It also aids in identifying the topics and issues to be evaluated and considered throughout the planning process.

The process includes five main components:

- Developing a coding structure
- Employing a comment database for comment management
- Reading and coding public comments
- Interpreting and analyzing the comments to identify issues and themes
- Preparing a comment summary

A coding structure was developed to help sort comments into logical groups by topics and issues. The coding structure was derived by analyzing the range of topics discussed during internal NPS scoping, past planning documents, and the comments themselves. The coding structure was designed to capture all comment content rather than to restrict or exclude any ideas.

The NPS PEPC database was used for managing the comments. The database stores the full text of all correspondence and allows each comment to be coded by topic and issue. Outputs from the database include the total number of correspondence and comments received, sorting and reporting of comments by a particular topic or issue, and demographic information for the sources of the comments.

Analysis of the public comments involved assigning codes to statements received from the public in letters, email messages, and written comment forms. All comments were read and analyzed, including those of a technical nature; opinions, feelings, and preferences of one element or one potential alternative over another; and comments of a personal or philosophical nature.

During coding, comments were classified as substantive or non-substantive. As stated in NPS Director's Order 12, substantive comments "raise, debate, or question a point of fact or policy." Comments that suggested changes to the range of alternatives or suggested new alternatives or alternative elements were also considered substantive. Comments in favor of or against the alternatives or comments that only agree or disagree with NPS policy are not considered substantive. All comments were read and considered and will be considered in the development of the final plan/EIS; however, only those determined to be substantive were used to develop concern statements.

Although the analysis process attempts to capture the full range of public concerns, this content analysis report should be used with caution. Comments from people who chose to respond do not necessarily represent the sentiments of all members of the public. Furthermore, comment analysis is not a vote counting process; comment analysis emphasizes the content of the comment rather than the number of times a comment is received.

CONTENT ANALYSIS REPORT

TABLE 1: CORRESPONDENCE DISTRIBUTION BY CODE

Note: Each correspondence may have multiple codes, so the total number of correspondences in this table will reflect multiple countings.

Code	Description	# of Correspondence	% of Correspondence
AL6400	Alternatives: Support Alternative A	58	30%
AL2000	Alternatives: Support ORV Access (Non-substantive)	17	9%
AL4000	Alternatives: New Alternatives or Elements	12	6%
AE1035	Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive)	10	5%
AL7000	Alternatives: Alternative B	8	4%
AE10060	Affected Environment: Issues Considered but Dismissed	7	4%
AL5045	Alternative Elements: Permit Requirements	6	3%
AL5055	Alternative Elements: Zone System	6	3%
AL9000	Alternatives: Alternative D	5	3%
AE2000	Affected Environment: Soils	5	3%
AL5046	Alternative Elements: Permit Requirements (Non-substantive)	5	3%
AL5056	Alternative Elements: Zone System (Non-substantive)	4	2%
AL2011	Alternatives: Oppose ORV Restrictions (Non-substantive)	4	2%
AL5010	Alternative Elements: Monitoring and Enforcement	3	2%
AL5020	Alternative Elements: Camping, Campfires, and Other Amenities	3	2%
MT1000	Miscellaneous Topics: General Comments	2	1%
AL9400	Alternatives: Support Alternative D	2	1%
CC1000	Consultation and Coordination: General Comments	2	1%
AL5050	Alternative Elements: Designated Vehicle Routes/Areas	2	1%
AL7600	Alternatives: Oppose Alternative B	2	1%
VU4005	Visitor Use and Experience / Health and Safety: Impact of Proposal and Alternatives (Non-substantive)	2	1%
AL5065	Alternative Elements: Education and Outreach	2	1%
AE1022	Affected Environment: T&E and Species of Concern (Non-substantive)	2	1%
GA1000	Impact Analysis: Impact Analyses	1	1%
AL9600	Alternatives: Oppose Alternative D	1	1%
AE1050	Affected Environment: Management and Operations	1	1%

Code	Description	# of Correspondence	% of Correspondence
AE15000	Affected Environment: Archeology Resources	1	1%
PN3000	Purpose and Need: Scope of the Analysis	1	1%
AL5036	Alternative Elements: Equipment Requirements (Non-substantive)	1	1%
AL8000	Alternatives: Alternative C	1	1%
AL6000	Alternatives: Alternative A	1	1%
AL5066	Alternative Elements: Education and Outreach (Non-substantive)	1	1%
AE10065	Affected Environment: Issues Considered but Dismissed (Non-substantive)	1	1%
AL5040	Alternative Elements: Speed Limits	1	1%
AE1010	Affected Environment: Soundscapes and Acoustic Environment	1	1%
AL8600	Alternatives: Oppose Alternative C	1	1%
AE2005	Affected Environment: Soils (Non-substantive)	1	1%
AE1030	Affected Environment: Visitor Use and Experience / Health and Safety	1	1%
AL1001	Alternatives: Elements Common to All Alternatives (Non-substantive)	1	1%
AL5015	Alternative Elements: Monitoring and Enforcement (Non-substantive)	1	1%
AR4000	Archeology Resources: Impact of Proposal and Alternatives	1	1%
TE4000	Threatened and Endangered Species: Impact of Proposal and Alternatives	1	1%
AL5030	Alternative Elements: Vehicle Requirements	1	1%
AL6200	Alternatives: Alternative A (Non-substantive)	1	1%
MO4000	Management and Operations: Impact of Proposal and Alternatives	1	1%
AL5035	Alternative Elements: Equipment Requirements	1	1%
AL7400	Alternatives: Support Alternative B	1	1%
PN4000	Purpose and Need: Park Legislation/Authority	1	1%
AL4005	Alternatives: New Alternatives or Elements (Non-substantive)	1	1%
AL2010	Alternatives: Support ORV Restrictions (Non-substantive)	1	1%
Total		196	100%

TABLE 2: CORRESPONDENCE BY TYPE

Type	# of Correspondence
Web Form	100
Park Form	11
Letter	2
Other	2
Fax	1
Total	**116**

TABLE 3: CORRESPONDENCE BY ORGANIZATION TYPE

Organization Type	# of Correspondence
State Government	1
Recreational Groups	1
Federal Government	1
Unaffiliated Individual	113
Total	**116**

TABLE 4: CORRESPONDENCE DISTRIBUTION BY STATE, TERRITORY, OR COUNTRY

State	Percentage	# of Correspondence
Texas	96%	111
DC	1%	1
Oklahoma	1%	1
Unknown	2%	2
Total		**116**

TABLE 5: CORRESPONDENCE DISTRIBUTION BY COUNTRY

Country	Percent	# of Correspondence
USA	100%	116
Total		**116**

COMMENT RESPONSE REPORT

Lake Meredith National Recreation Area
Draft Off-road Vehicle Management Plan and Environmental Impact Statement

AE10060 – Affected Environment: Issues Considered but Dismissed

Concern ID: 44289

CONCERN STATEMENT: Commenters questioned not carrying forward socioeconomics as an impact topic, expressing concern that regulating ORV use would impact local businesses. Some commenters also expressed concern regarding the business survey, feeling that more than four businesses should have been interviewed. One commenter requested that the NPS discuss minority and low-income populations, and the associated Executive Order 12898, in the final EIS.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313168 **Organization Type:** Unaffiliated Individual

Representative Quote: The economic impact to the region from lost visitation days could be disastrous for the businesses and communities that benefit from the ORV use in LMRA. The Draft EIS proposes the socioeconomic impacts from the various proposed alternatives to be small. The Draft EIS/ORV Management Plan states: "Based on the experience of national recreation area staff and a survey of local businesses, visitor spending in the ROI is low." Many businesses and municipalities would probably disagree. According to the NPS report entitled "Economic Benefits to Local Communities from National Park Visits, 2011", the economic impact from the LMRA area in 2011 totaled $32,446,000 and represented 382 jobs. If you further extrapolate the dollars associated with just the Rosita Flats area based upon this report, the local economic impact from the use of the ORV area is estimated to be approximately $12,353,214 ($49.86/person/day x 247,758 visitation days, according to this same report). My suspicion is that the local municipalities and local governmental representatives would not consider a loss of this magnitude to be "low" to the local economies. Either the "area staff" of the NPS is ill-equipment to perform proper and representative socioeconomic studies of the proposed alternatives or the NPS believes that $12,000,000 worth of spending is not significant to our local economy.

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313169 **Organization Type:** Unaffiliated Individual

Representative Quote: One must place the ORV area in proper perspective with the remainder of the LMRA properties and its impact to the communities. The Rosita Flats portion of the park represents only 5% of the total park acreage (2,267 ac of the 44,978 ac total) but brings 38% of the monies into the economy. The NPS needs to seriously consider a likely upset of the local economy with the debatable environmental impact of ORV use in the park. With increased rules, regulations, restrictions, and most importantly, imposed fees, the use of Rosita Flats will continue to decline and will most assuredly impact the socioeconomics of the local area. The NPS must certainly take this into account when evaluating the various alternatives.

Corr. ID: 81 **Organization:** West Texas Outlaws Off Road Club
Comment ID: 313129 **Organization Type:** Unaffiliated Individual

Representative Quote: Another glaring incomplete analysis was the economic impact survey. Only 4 businesses where polled as to the effect on their revenue if the river was limited to usage and visitors declined. What about groceries, gasoline, auto parts, vehicle dealers, campers, hotels? Why were the gateway communities not included? With Lake Meredith no longer able to attract boaters why not ask the business there what they would think of losing even more income?

Corr. ID: 85 **Organization:** AMA
Comment ID: 313141 **Organization Type:** Unaffiliated Individual

Representative Quote: One perspective that is negative will be economic impact that limiting off road vehicles at the discussed locations. Locally owned business will feel the greatest negative impact. David Brown's Sport Center and Sharp's Motorsports already sell the OHV stickers at virtually zero profit. Now if the suggested management programs are implemented, even greater losses will ensue. Declining ATV, UTV and motorcycle sales will surely impact the already fragile Panhandle market. One would think the State of Texas would want to cultivate and grow the OHV market to reap the possible millions in sales tax. And the impact does not stop there. The recreational vehicle market will also suffer without a local place to camp out and ride one's OHV.

Corr. ID: 116 **Organization:** US Environmental Protection Agency – Region 6
Comment ID: 315690 **Organization Type:** Federal Government

Representative Quote: Socioeconomic, Page 18 – The DEIS did not include any socioeconomic data concerning minority or low-income populations. Also the NPS did not list Executive Order (E.O) 12898 in the relevant laws section of the DEIS. Discuss the rationale for excluding E.O. 12898 and associated socioeconomic analysis in the Final EIS.

RESPONSE: The topic of socioeconomics was considered in the development of the draft plan/EIS, and was dismissed from detailed analysis as described in chapter 1 of the plan/EIS. Although some commenters expressed concern about a loss of the spending from ORV use, the loss discussed assumed loss of all ORV use. None of the alternatives being considered would result in an ORV ban or 100 percent loss of ORV use, so this impact would not occur under the proposed plan. Under the plan/EIS, it is expected that a substantial fraction of visitors would continue to visit the recreation area and those who were worried about safety may be more likely to visit.

In determining if socioeconomics would be carried forward for detailed analysis, the impact on the three-county region of influence (ROI) was estimated (further described in chapter 1 of the plan/EIS). This analysis used IMPLAN, an input-output model, and looked at the impact of several levels of reduction in visitation, including a 50 percent decrease in ORV visitation. The results suggested that the adverse employment and output effects would be less than 1 percent for the entire three-county ROI. IMPLAN is the basis for the estimates provided in the report "Economic Benefits to Local Communities from National Park Visits, 2011." The impacts in the report represent the impact of spending by all visitors compared to a

scenario of no visitors (this would happen if the park closed and no other economic activity took place on the land). The model estimates of value added are comparable to Gross Domestic Product for the county. These estimates are calculated based on estimates of spending per party (not individual visitor) and take into account the fact that not all the direct spending by visitors stays in the area (businesses buy their inventory from outside the region), the ripple effects of spending through the economy, and exclude spending by local residents (assuming that local residents would have spent their money on something else in the local area if the park were closed). The assumptions about visitor party size, length of trip, activities, and spending are based on surveys from this and other parks. The impacts of the proposed management alternatives in the plan/EIS will be much smaller because they will not result in a 100 percent decrease in visitation.

As discussed in the plan/EIS, although the socioeconomic impacts on the ROI maybe small, the impacts will be larger for businesses that directly serve ORV visitors to Lake Meredith. There may be individual businesses that experience negative impacts from the proposed alternatives. The impacts will depend on the number of visitors that continue to visit Lake Meredith and whether the management actions to improve visitor safety and experience draw new or increased visits.

The IMPLAN analysis focused on the impacts of potential reduced visitor spending in the ROI. The business survey was not intended to provide a full accounting of the impacts, but to explore the impacts on businesses that serve the Lake Meredith visitors who were most likely to be affected. The focus of the survey was on businesses near Lake Meredith that sold all-terrain vehicles (ATVs), campers, motorcycles, watercraft, and other motorized vehicles because they are most likely to be familiar with ORV visitors, as opposed to stores such as gas stations that would serve all visitors to Lake Meredith.

In regards to Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, a description of this executive order has been added to the section in chapter 1 titled, “Relevant Laws, Policies, Regulations, and Plans.”

Executive Order 12898 defines a minority as any person who identifies themselves as being of a race other than non-Hispanic White alone. The minority population of an affected area is present when either the minority population of the affected area exceeds 50 percent or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). For purposes of analysis in this plan/EIS, the threshold to determine high concentrations of minority residents is when the area under analysis comprises minority populations more than 10 percent greater than the benchmark or reference region. In this case, the reference or benchmark geographic area is Texas. As demonstrated in table 1 (in chapter 1 of the final plan/EIS), all counties in the ROI are less than 10 percentage points greater than the Texas average. Therefore, the ROI is not classified as an area with high concentrations of minority residents.

Guidance from the U.S. Census classifies a poverty area as areas where 20 percent or more of the population lives below the poverty line. As demonstrated in table 1 (in chapter 1 of the final plan/EIS), two of the three counties in the ROI have populations with less than 20 percent of residents living below the poverty line.

Potter County has approximately 23 percent of its population living below the poverty line. The proposed action alternatives would regulate ORV use in different areas throughout Lake Meredith National Recreation Area. Routes where ORV use is allowed may change, although ORV use would largely still be permitted in the recreation area. Because any change in ORV use regulations would affect all users in the same manner, no disproportionate adverse impacts to low-income populations are anticipated. The proposed action alternatives would introduce an annual permit fee to use ORVs within the recreation area. This fee would apply to all visitors accessing the recreation area with personal ORVs and would represent a small fraction of the cost associated with purchasing and maintaining these vehicles. Therefore, it is not anticipated that permit fees introduced as part of the proposed action alternatives would result in disproportionate adverse impacts to low-income populations in Potter County and the larger ROI, and this topic was not carried forward for analysis. This information is also included in chapter 1 under "Issues Considered but Dismissed from Further Consideration."

TABLE 1. ENVIRONMENTAL JUSTICE STATISTICS, 2010

Geographic Area	Percentage of Population	
	Minority	Below the Poverty Level
United States	36%	14%
Texas	55%	17%
Hutchinson County[a]	26%	15%
Borger Urban Cluster	26%	13%
Moore County	62%	13%
Potter County	51%	23%
ROI[b]	49%	20%

[a] Includes Borger urban cluster.

[b] Per capita income was calculated as an average of the three counties; minority, poverty, and graduation statistics were calculated from actual population figures.

Source: U.S. Census Bureau, 2010.

Concern ID: 44290

CONCERN STATEMENT: One commenter requested that mitigation measures related to air quality be added to the final plan/EIS, including separation of visitor uses, planned ORV routes, and suspension of ORV use during excessive wind events.

Representative Quote(s):

Corr. ID: 116 **Organization:** US Environmental Protection Agency – Region 6

Comment ID: 315691 **Organization Type:** Federal Government

Representative Quote: Air Quality, Page 19 – The DEIS analyzes a range of alternatives and actions for the management of off-road vehicle (ORV) use at Lake Meredith National Recreation Area in the Texas panhandle, northeast of Amarillo. During the scoping process for the plan, topics such as air quality were not further analyzed because the impact level or frequency was not sufficient to warrants a full analysis. Existing air monitoring data in the area does not indicate an air quality problem (e.g., particulate matter) for the area, however, localized air quality impacts from ORV use can affect visitor experience, health and safety. EPA

recommends that the project alternative selected include mitigation such as separation of visitor uses so that fugitive dust impacts during high wind vents are minimized, planned ORV routes, or suspension of ORV use during excessive wind events.

RESPONSE: While it has been documented that ORV use contributes to increased atmospheric particulate matter levels in the form of fugitive dust (WESTEC 1979), subtle meteorological dispersion effects in the Texas panhandle are such that these impacts are unlikely to present significant threats to human health. Stable thermal stratification allows large dust particles to settle out of the air quickly, while allowing smaller particles to remain suspended and presenting potential health risks to sensitive receptors (WESTEC 1979). Atmospheric conditions in the vicinity of Lake Meredith National Recreation Area are characterized by consistent winds of varying speeds. High winds send dust higher into the atmosphere where the dust is dispersed to the surrounding area, away from potential receptors in the area (WESTEC 1979).

To address any concerns related to air quality, the preferred alternative presented in the draft plan/EIS includes both separation of uses and planned ORV routes. The analysis of visitor experience discloses that dust may be bothersome to ORV users in the ORV areas at Blue Creek and Rosita Flats. However, impacts will be minimized through separating visitor uses using a zone system that separates campers from riders and separates different track vehicles. All the action alternatives designate specific routes and areas for riding. Finally, Rosita and Blue Creek do not attract non-ORV users, so there are few opportunities for separation since most users visit to participate in the same activity: off-road driving and associated activities.

In addition to the separation of uses and designation of routes, the action alternatives all include a speed limit that may also reduce dust.

The NPS considered suspension of ORV use during excessive wind events, but due to the unpredictable, sporadic, and brief nature of the events in this area, implementation would not be practical. High wind events in this area usually occur quickly and last for a short period, making it difficult to monitor these events and implement closures. The events generally last a brief period, which in many cases would result in the event being over before a closure could be implemented. Further, very few riders on ATVs or similar open vehicles choose to ride during high wind events, limiting the need for this restriction. For these reasons, this element was considered, but not incorporated into the preferred alternative because of technically impracticability.

AE1010 – Affected Environment: Soundscapes and Acoustic Environment

Concern ID: 44291

CONCERN STATEMENT: One commenter expressed concern that the sound study was conducted during the time of year when most use occurs.

Representative Quote(s):

Corr. ID: 106 **Organization:** *Not Specified*

Comment ID: 313185 **Organization Type:** Unaffiliated Individual

Representative Quote: Study is incorrect, incomplete and skewed! …Esp sound study done in February when there is majority of usage.

RESPONSE: As described in the *Lake Meredith National Recreation Area Acoustic Monitoring and Modeling of Off Road Vehicles*, long-term sound measurements were conducted using NPS methodology and software. The study cites the NPS Air Tour Management Planning Acoustic Sampling and Resource Management Guide. The NPS protocols are intended to ensure standardized methodology, scientific defensibility, and comparability to other studies.

The Air Tour Management Planning protocol states, "it is important to measure the ambient sound levels both with and without human-generated sound." The NPS Acoustical Sampling and Analysis Guide cites Section 8.2.3 of the NPS *Management Policies 2006* on the natural ambient sound level and further states, "acoustical monitoring must document the different kinds of noise sources affecting the park."

The Lake Meredith acoustic monitoring and modeling study contained two separate measurement campaigns with sufficient duration to satisfy the requirements of NPS protocols. "The 2008 campaign targeted the season with relatively low park use or minimal visitors" to capture the natural ambient sound level with a minimal amount of human-generated sound, while "the 2009 campaign targeted the annual Sand Drags event" in order to accurately assess the period of peak park use.

AE1030 – Affected Environment: Visitor Use and Experience / Health and Safety

Concern ID: 44292

CONCERN STATEMENT: Commenters stated that the NPS does not have an accurate view of the number or type of visitors at the recreation area. They expressed further concern that the decline in 2012 use numbers was related to an increase in the state ORV sticker, and that imposing an additional permitting requirement with a fee may result in an additional decline in visitation.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313166 **Organization Type:** Unaffiliated Individual

Representative Quote: My educated opinion is that one of two things occurred in 2012 to reduce the number of visitors in the Rosita Flats area: 1) errors in traffic counting, which probably is unlikely, or 2) the cost of OHV stickers more than doubled over the previous year. If the drop in visitor numbers is due to the increased cost of ORV stickers (i.e. user fees) let this serve as a warning to the NPS that a yearly user fee of $40 per user vehicle will likely have significant

impact on the ORV use at the LMRA. It is my sincere hope that this is not the intent of the park user fee.

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313165 **Organization Type:** Unaffiliated Individual

Representative Quote: In the calendar year 2009, approximately 1,080,644 people visited the LMRA. Of those, 252,193 or approximately 23% visited the Rosita Flats area. This represented 1 out of every 5 people in the park. In 2010-2012 the park visitation was 883,586, 734,030, and 502,457, respectively. For the same time-frame Rosita Flats visitation totaled 299,401, 247,758, and 116,389 people, respectively (2010-2012). A quick review of Table 9 in the NPS report "Statistical Abstract 2011" (document 999/119403, January 2013) reveals that the NPS doesn't have a clear understanding of the user groups and potential visitation for the LMRA. The NPS forecasted visitation for 2012 was 763,975. Actual visitation was 502,457 which represents an error of 35%. Furthermore, the NPS forecasted the 2013 visitation for LMRA to be 714,790. I'm sure the actual visitation to the park will be equal to or less than it was in 2012 due to lake level decline and high ORV sticker costs. It is obvious that the NPS doesn't fully understand the user groups and visitation habits of the public for this park.

RESPONSE: In the development of the plan/EIS, actual visitation numbers (rather than forecasts) were used, resulting in an accurate representation of visitation in the plan/EIS. The accuracy of forecasts used for other documents, such as the Statistical Abstract 2011, is outside the scope of this planning effort.

The NPS appreciates concerns regarding the impact of implementing a permit fee on visitor use levels. Using the Texas off-highway vehicle program as an example, per the commenter, even with implementation of a sticker fee (which the NPS began to enforce in 2007), the percentage of use in the park that is related to ORVs has increased over the years. The table below shows this visitation, beginning in 2006 (when the cost of a sticker was $8) until 2012 (when the cost of a sticker was $16). Based on these trends, the NPS expects any decline in visitation related to the requirement for a permit to be minimal.

PERCENTAGE OF VISITATION IN ORV AREAS, 2006-2012

Year	Annual Number of Visitors	Annual Number of Visitors to the ORV areas	% of Recreation Area Visitors in ORV Areas
2006	1,037,611	143,348	14%
2007*	984,109	123,990	13%
2008	875,281	240,944	27%
2009	1,080,645	306,711	28%
2010	883,566	344,345	39%
2011	734,030	279, 965	38%
2012	502,457	135,147	27%
*NPS started enforcing Texas OHV sticker requirement			

AE1050 – Affected Environment: Management and Operations

Concern ID: 44293

CONCERN STATEMENT: One commenter expressed concern that the recreation area's budget indicates that the NPS prioritizes resources over visitor safety.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313170 **Organization Type:** Unaffiliated Individual

Representative Quote: NPS documents indicate that the LMRA budgets are as follows: 2006 $2.2M; 2007 $2.3M (requested amount); 2008 $2.8M; 2009 $3.1M; and for 2010 $3.2M (requested). In 2008, the LMRA requested an additional 3 full time equivalents (FTEs) for law enforcement and protection of park visitors and resources. Also in 2008, the LMRA requested an additional 4 FTEs to help eradicate invasive plant species and protect threatened and endangered species. I'm not sure if LMRA received the additional FTEs or not, but what strikes me about this is that the NPS seemingly placed a higher priority (more requested FTEs) on the salt cedar and the 3 threatened and endangered species than it did on visitor safety.

RESPONSE: NPS *Management Policies 2006* states that "The Service…will seek to provide a safe and healthful environment for visitors and employees." This planning effort and the preferred alternative put an emphasis on both resource protection and visitor safety. Per Executive Order 11644, the plan and preferred alternative designate routes to "minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors." The plan also discusses the potential to increase law enforcement presence in the national recreation area and the potential to locate law enforcement staff closer to the Rosita Flats area. Either of these changes would occur through the use of the permit fee program. The overall number of staff dedicated to various activities is outside the scope of this plan; however, through the elements listed above, the NPS has considered visitor safety in this planning process.

AE15000 – Affected Environment: Archeology Resources

Concern ID: 44294

CONCERN STATEMENT: One commenter stated that the draft plan/EIS incorrectly states that none of the recorded archeological sites within the boundaries of the recreation area are listed or considered eligible for listing in the National Register of Historic Places (National Register), including sites in Rosita Flats. The commenter further stated that sites with undetermined eligibility should be treated as though they were eligible until eligibility can be determined.

Representative Quote(s):

Corr. ID: 113 **Organization:** State Historic Preservation Officer

Comment ID: 315681 **Organization Type:** State Government

Representative Quote: The document is incorrect in stating that none of the recorded sites within the boundaries of the Lake Meredith National Recreation Area are listed or considered eligible for listing in the National Register. Our

records indicate that many sites within the national recreation area have been determined eligible and the vast majority have undetermined eligibility.

Of the 20 or more previously recorded sites within the portion of the Lake Meredith NRA immediately surrounding the Rosita Flats ORV use are, most have undetermined eligibility and at least one has been determined eligible. Several of these sites actually fall within the highlighted Rosita Flats ORV use area. While no sites have been recorded within the sandy bottom area of the Blue Creek ORV, many sites are adjacent to the creek within the Lake Meredith NRA boundary. Most of these have not been evaluated for NRHP eligibility.

Site that have undetermined eligibility status should be treated as though they are eligible or avoided entirely until eligibility can be determined.

RESPONSE: The purpose of this ORV management plan/EIS is to manage ORV use in the national recreation area for visitor enjoyment and recreation opportunities, while minimizing and correcting damage to resources. As part of that purpose, under the preferred alternative (alternative D) routes and areas were established to avoid sensitive resources, including archeological sites within the two ORV areas. For the few sites that are located within a designated ORV area, barriers to the site will be put in place to avoid further damage to the sites from ORV use. Instances in the document that discuss the status of recorded sites have been corrected to indicate that they have been listed, or have undetermined eligibility, as appropriate.

AE2000 – Affected Environment: Soils

Concern ID: 44295

CONCERN STATEMENT: Commenters stated that the erosion in the area is mainly due to natural causes, such as water and wind, as well as drilling operations, and that ORV use makes a smaller contribution to erosion.

Representative Quote(s):

Corr. ID: 23 **Organization:** Post Enduro Association, AFD retired

Comment ID: 312611 **Organization Type:** Unaffiliated Individual

Representative Quote: I have heard comments about the erosion we cause should be stopped but if you study the erosion caused by the many industrial quarrying and drilling operations going on in the Canadian River area it is apparent that the ORV use is a small part of that erosion.

Corr. ID: 47 **Organization:** *Not Specified*
Comment ID: 312892 **Organization Type:** Unaffiliated Individual

Representative Quote: The report claimed that off road use was causing erosion to the area. If you have spent any time in this area then you are familiar with the wind that blows quite freely for lack of a better description. This will impact the erosion factor in much more depth than ATV's. Please don't think I am totally oblivious to the problems associated with ATV's, UTV's and Dune buggies. I am sure there is an impact but I don't think it is creating a problem that the everyday weather in this part of the country or Mother nature are not doing on a daily basis.

Corr. ID: 81 **Organization:** West Texas Outlaws Off Road Club
Comment ID: 313126 **Organization Type:** Unaffiliated Individual

Representative Quote: The Canadian river bed changes due to wind and rainfall every time I go to Rosita even if the visits are just a few days apart. I don't feel like it is fair or accurate to try to show off- roaders as the cause of erosion.

Corr. ID: 85 **Organization:** AMA
Comment ID: 313140 **Organization Type:** Unaffiliated Individual

Representative Quote: The impact of trail management or closure is a watershed moment for a motorcyclist enthusiast such as myself. I have ridden at the Canadian River and Rosita Flats area for 31 years. I have seen many changes in the landscape in the area over the years. Many of these changes have been due to water and wind erosion. Granted there is mechanical erosion from 4 wheel drive vehicles, ATV's, and UTV's, it is overshadowed by acres of erosion due to flooding. It is this mechanism that changes the landscape most drastically, in my opinion. And I would argue that I have spent more time and have a more intimate knowledge of the landscape at the River than any of the NPS employees and scientists.

Corr. ID: 114 **Organization:** *Not Specified*
Comment ID: 315684 **Organization Type:** Unaffiliated Individual

Representative Quote: Yes there is erosion but a good rain washed more of Chicken Creek in one storm than off-roaders did in thirty years of use. Yes, some trails are eroded, but to these trails and the foliage around them pay taxes?

RESPONSE: While erosion due to wind and water occurs naturally, erosion due to human induced processes, such as ORV use, has been shown to accelerate and intensify these processes. ORV use changes the speed, timing, quantity, and quality of water moving through the landscape altering surface hydraulics and causing channelization of soil surfaces (Taylor n.d.).

The plan/EIS shows that soil compaction from ORV use decreases soil permeability, which contributes to more highly channelized runoff during storm events and corresponding erosion of adjacent areas. Moreover, in the absence of designated ORV routes, direct impacts from ORVs could result in the loss of vegetation, which would also result in higher erosion potential. Other recreational activities, such as camping in vegetated areas, would similarly continue to result in disturbance and damage to soils through compaction and erosion.

Furthermore, studies have shown that ORV use reduces plant cover and density, and that a single pass can destroy many types of plants, microfloral crusts, and soils. Desert and arid region plants are particularly susceptible due to their characteristic shallow root systems (Taylor n.d.). At the national recreation area, unauthorized ORV use has been found to result in destruction of surface vegetation which further exacerbates the erosion effects described above.

AL4000 – Alternatives: New Alternatives or Elements

Concern ID: 44296

CONCERN STATEMENT: One commenter suggested that the recreation area look into grants to maintain and improve the trails and camping areas.

Representative Quote(s):

Corr. ID: 1 **Organization:** *Not Specified*

Comment ID: 310281 **Organization Type:** Unaffiliated Individual

Representative Quote: does yamaha, honda, kawasaki, polaris, and other major atv manufacturers offer grants to parks for trail improvement?
does the travel trailer industry offer grants to help parks improve camping areas?
these are things to check.

RESPONSE: The NPS is open to working with partners to provide improvements to ORV areas. Seeking funding from private sources relates to the implementation of the plan. These sources will be considered as the plan is finalized and implemented.

Concern ID: 44297

CONCERN STATEMENT: Commenters requested that ORV use areas be expanded, including allowing access to the lake.

Representative Quote(s):

Corr. ID: 25 **Organization:** *Not Specified*

Comment ID: 312614 **Organization Type:** Unaffiliated Individual

Representative Quote: The only change I would consider is an expansion of the current OHV area with multiple access points. This would reduce congestion in the Rosita Flats area and create multiple access points for the public and emergency vehicles.

Corr. ID: 38 **Organization:** *Not Specified*
Comment ID: 312876 **Organization Type:** Unaffiliated Individual

Representative Quote: We would like the Lake Meredith area opened up for OHV use. This area is losing money from the lake levels being so low. We would love to be able to ride to the lakes edge and get our lawn chairs out and enjoy it, without having to worry about hitting something with the prop on our boat.

Corr. ID: 58 **Organization:** *Not Specified*
Comment ID: 312916 **Organization Type:** Unaffiliated Individual

Representative Quote: Please keep the Canadian river (Rosita flats) open to orvs and I would like to see the boundary extended into lake Meredith area

Corr. ID: 106 **Organization:** *Not Specified*
Comment ID: 313184 **Organization Type:** Unaffiliated Individual

Representative Quote: Open up more areas instead of closing them off for more riding. We can ride our 4-wheeler and ATVs anywhere. Keep the money here for our economy to improve!!

Corr. ID: 110 **Organization:** *Not Specified*
Comment ID: 315674 **Organization Type:** Unaffiliated Individual

Representative Quote: There should be some portions of the now exposed lake bottom that should be considered for ORV use. Perhaps extend the limits of use in Blue West Creek towards the mouth of the canyon.

RESPONSE: As described in chapter 2 of the plan/EIS, the creation of new ORV use areas was considered, but the NPS determined that this ORV plan should focus on ensuring compliance for existing areas before considering new areas. Planning for new ORV use areas would need to occur under a separate planning process. Establishment of new routes and areas is not part of the purpose of and need for this plan, and is considered outside the scope of this planning process. Expanding ORV use to new areas was also dismissed because vehicle use in areas previously untouched by motorized use could result in new impacts to resources, visitor use and experience, and staffing. This would not meet plan objectives related to visitor use and safety, management, natural resources, and national recreation area operations (see chapter 1 in the plan/EIS). Such impacts could include

- Degradation of water quality and drinking water through increased soil erosion from additional ORV use areas
- Habitat fragmentation from the establishment of additional ORV routes and areas
- Lack of staff to provide services to additional areas
- Exacerbation of existing trespassing problems
- Potential for additional conflicts with other national recreation area visitors and recreational uses

The development of new ORV areas would be anticipated to result in adverse natural and cultural impacts, and would require additional site-specific evaluation and planning beyond the scope of this plan.

Concern ID: 44298

CONCERN STATEMENT: Commenters voiced support for transferring Rosita Flats to state ownership. One commenter had concerns with this potential alternative, stating that this could result in the loss of land for public use.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313172 **Organization Type:** Unaffiliated Individual

Representative Quote: Another concern of mine is the alternative about trading or selling the ORV portion of the LMRA to the State of Texas. While I'm generally an advocate of state's rights, I'm not in favor of Texas managing this public property as an ORV area or state park. I have seen first hand along the Canadian River (both upstream and downstream of the lake) how influential land owners have taken public land for their very own by moving fences down to the existing waterline. When I confronted the General Land Office of Texas about this, I received no support whatsoever, even though they acknowledged I was probably right. The "good ol' boy" system between influential landowners and legislators (often one in the same) is alive and well in Texas. If the NPS trades the LMRA to the State, I'm afraid the citizens will eventually lose some or all public access to this great recreation area. Fortunately, this proposal has been tabled for now.

Corr. ID: 81 **Organization:** West Texas Outlaws Off Road Club
Comment ID: 313130 **Organization Type:** Unaffiliated Individual

Representative Quote: I really wish that the state and the NPS could come to terms with a land swap and the Blue Creek and Rosita Creek ORV areas and to be honest all Lake Meredith lands except the Alibates monument become a state managed off road park. This would increase tax revenue through out the areas and maybe make up for the lose of the lake.

Corr. ID: 106 **Organization:** *Not Specified*
Comment ID: 313186 **Organization Type:** Unaffiliated Individual

Representative Quote: Best alternative not even considered eg trade off with state for land to return LM to Texas and return tax money to Fritch!

RESPONSE: As stated in chapter 2 of the plan/EIS, throughout the planning process, the NPS has considered requesting a change in the boundary of the national recreation area to exclude Rosita Flats. While the NPS does not oppose a boundary change and can see benefits to a single management unit in the Rosita Flats area, this option is not being evaluated in this plan/EIS. A potential boundary change has been excluded from the analysis because there are no current opportunities or anticipated funding for a combined management unit or for a state-operated ORV park at this time.

Therefore, any analysis in this document would be too speculative to provide an accurate description of how the lands would be managed subsequent to divestiture. The NPS plans to continue to work collaboratively with the state of Texas in managing ORV use in the Rosita Flats area. At a future date, the NPS is likely to reevaluate this issue because a boundary change would have many benefits for the NPS. If or when the NPS considers a boundary change, the public would be notified and the NPS would initiate a new NEPA process, which would address concerns raised by commenters.

Concern ID: 44299

CONCERN STATEMENT: Commenters suggested providing an entry gate that charges a fee. One commenter suggested that the recreation area follow the model of Lake MacKenzie in Silverton, Texas, which charges a fee for use and provides amenities.

Representative Quote(s):

Corr. ID: 95 **Organization:** Local Resident

Comment ID: 313152 **Organization Type:** Unaffiliated Individual

Representative Quote: Take a look at Lake MacKenzie by Silverton, TX. Separate area for ATV use. Fees for campsites (with full hookups), daily user fee & a daily vehicle fee. A long weekend is expensive… Gas traveling and all the fees, but for nice facilities & trails they are doing great business. Campsites have to be reserved in advance. Dump stations for rvs & bathroom with shower make it nice for day use also. They only ATV, UTV or motorcycles on their trails. It is clean also! I think something similar in this area would be a great boost in the economy that the low lame levels have lost. Not to mention all the fee money for using it. I think the fees help keep out the riff-raff & rarely see trash. People that go take care of it & the facilities provided.

Corr. ID: 103 **Organization:** *Not Specified*
Comment ID: 313181 **Organization Type:** Unaffiliated Individual

Representative Quote: We (a few ORV operators) have felt the best way to keep the trails in the best shape is to keep out the people who are not there to actually do any off-roading. The only way to ensure that is to charge at a gate or fence. If they have to pay they will go other places. Then and only then will the trails get better for the people who will actually be using them. The trails will also be easier to patrol since the people who are on the trails are there to actually use them.

RESPONSE: As stated in the plan/EIS (chapter 2, alternative D), the NPS preferred alternative would implement a permit fee system. Fees from this permit would be used to enhance amenities at the ORV areas on a phased in basis, as well as increase law enforcement as funds allow. This system would be similar to the ones noted by commenters, without a fee station at the ORV areas. Construction and operation of a fee station at the ORV areas is not technically feasible because there is no power in those areas, and the location of Rosita Flats in a regulated floodplain prohibits the development of a structure in that area.

Concern ID: 44300
CONCERN STATEMENT: One commenter expressed concern that ORVs entering the main trail east of U.S. Highway 287 could have accidents due to poor visibility and suggested allowing crossing or entering only at the main road, where there is better visibility.

Representative Quote(s):

Corr. ID: 104 **Organization:** *Not Specified*

Comment ID: 313182 **Organization Type:** Unaffiliated Individual

Representative Quote: A specific concern is ORVs entering the main trail east of 287 on the sound side of the Canadian River through cuts in the high banks. Visibility is poor and an accident could happen. Possible corrective measures could be block unsafe access – only allow crossing or entering the main road where terrain is flat enough to allow good visibility.

RESPONSE: The NPS is unaware of the exact location being noted by the commenter, and therefore cannot determine if the suggestion applies to lands for which the NPS has jurisdiction. However, the NPS does believe that the safety concerns raised by the commenter are addressed under alternative D of the plan/EIS. This alternative includes elements such as requiring all ORVs to have a muffler, spark arrester, functioning headlights and taillights, and a triangular orange flag on top of an 8-foot pole attached to the ATV. Requirements for lights and flags will make ORVs more visible, and reduce the safety issues noted by the commenter.

AL5010 – Alternative Elements: Monitoring and Enforcement

Concern ID: 44301
CONCERN STATEMENT: Commenters requested that the plan include increased law enforcement presence. Specific suggestions included constructing a small contact station at Rosita Flats, having more patrols, and increasing fines. They also suggested that an emergency contact number be posted on bulletin boards.

Representative Quote(s):

Corr. ID: 1 **Organization:** *Not Specified*

Comment ID: 310280 **Organization Type:** Unaffiliated Individual

Representative Quote: post emergency phone numbers at the billboards so we know the numbers to contact even in the off hours.

Corr. ID: 1 **Organization:** *Not Specified*
Comment ID: 310279 **Organization Type:** Unaffiliated Individual

Representative Quote: make patrols more often. when out making patrols, check everyone's paperwork. issue citations on offenses. ZERO TOLERANCE. be fair, firm, and consistent. enforcement is key to making the areas a better place to play and hunt. make repeat offenders' fines progressive. they have got to learn it is for everyone's safety and benefit.

Corr. ID: 13 **Organization:** *Not Specified*
Comment ID: 312595 **Organization Type:** Unaffiliated Individual

Representative Quote: I also think a hefty fine for going beyond the approved sites should be enforced.

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313173 **Organization Type:** Unaffiliated Individual

Representative Quote: As I indicated earlier, the two things I believe that can make the LMRA ORV area work without implementing any new alternative is education and enforcement. There were proposals in the 2008 budget request for additional monies in part to increase education about the concerns of the ORV areas. These did not come to fruition. I frequent the Rosita Flats area often and I've yet to see any real education literature, signs, etc. about NPS concerns. I believe it would be entirely beneficial to construct a small office/structure just inside the entrance at Rosita Flats where people could purchase the state ORV stickers, learn about the LMRA, pick up literature on ecology preservation, and just talk to a park ranger about enforcement actions or safety.

This isn't a new concept by any means for the NPS. These small offices are located throughout the national parks and would be welcomed here as well. Short courses on trail management and rehabilitation could be taught and encouraged here and over time I believe we would see a shift in abuse of some of the trails. Unfortunately, this proposal to install a permanent or even semi-permanent building at the entrance to Rosita Flats has been rejected because the area is in a flood plain. This is really not a valid excuse because there are many places in the area of Rosita Flats that have never flooded in the 40+ years that I have been recreating there. A small wood frame building or even a steel building would not cost that much to erect and would go a long ways towards making this part of the park a better place to visit. Just the mere presence of an active NPS office would be a deterrent to some of the illegal activities taking place there now. It is easier to educate the public when a ranger is present.

RESPONSE: As stated in the plan/EIS (chapter 2, alternative D), the NPS preferred alternative would implement a permit fee system. Fees from this permit would be used, in part, to increase law enforcement, including the potential for locating a law enforcement contact station in the vicinity of Rosita Flats. As discussed for Concern ID 44299, construction of a law enforcement station at Rosita Flats is not

feasible due to lack of electricity and the site's location in a regulated floodplain.

In regards to increasing fines, while the NPS can recommend fines for violations in the national recreation area, the actual fines are set by the courts. In Texas, all Class C misdemeanor citations are handled by the Justice of the Peace in the county in which they occur. For violations in Rosita Flats, this responsibility falls to the Potter County Justice of the Peace in Precinct 3. In Blue Creek, this responsibility falls to the Moore County Justice of the Peace in Precinct 1. The maximum fine for most all Class C citations is $500.00 + court cost. The NPS does not have input into the fines ordered by the judge in each county. However, if the NPS issues a federal violation notice for something the state does not have a code for, the fine is set pursuant to Federal Rules of Criminal Procedure, Rule 58 (d) of the United States District Court for the Northern District of Texas. When the rule implementing the ORV plan is created, the NPS will issue an updated forfeiture of collateral schedule to this court for approval. The fines suggested by the NPS will need to be reasonable to be approved.

Commenters also requested that the NPS post an emergency number at the entrance of the ORV areas. The NPS does not have a separate emergency number or a specific number to report unauthorized ORV use. In case of emergency, visitors should dial 911, which is routed to the county. The county then passes on the information to the NPS to address the situation. Under all alternatives, this system for emergency contact would continue and would include the park phone number on information disseminated to the public to allow them to contact the park about non-emergency situations.

AL5020 – Alternative Elements: Camping, Campfires, and Other Amenities

Concern ID: 44302

CONCERN STATEMENT: Commenters requested additional amenities, such as bathrooms, dumpsters or trash cans, and covered tables. They suggested that cameras or volunteer watch groups be used to prevent damage to new amenities.

Representative Quote(s):

Corr. ID: 38 **Organization:** *Not Specified*

Comment ID: 312877 **Organization Type:** Unaffiliated Individual

Representative Quote: We would love to see more amenities especially if the OHV sticker price goes up in price.

Corr. ID: 38 **Organization:** *Not Specified*
Comment ID: 312878 **Organization Type:** Unaffiliated Individual

Representative Quote: Covered tables and tables in the Rosita area would be great, but how do we keep others from tearing them up? WE need to come up with a plan to keep the money in this area. Many of us have spent good money on our "toys" and would love to be able to enjoy them in this area.

Corr. ID: 74 **Organization:** *Not Specified*
Comment ID: 313089 **Organization Type:** Unaffiliated Individual

Representative Quote: I would love to see some pit toilets installed. Nothing fancy, just somewhere to take care of business.

Corr. ID: 80 **Organization:** *Not Specified*
Comment ID: 313124 **Organization Type:** Unaffiliated Individual

Representative Quote: add bathrooms with some kind of exterior cameras or volunteer watch groups.

RESPONSE: As stated in the plan/EIS (chapter 2, alternative D), the NPS preferred alternative would implement a permit fee system. Fees from this permit would be used to enhance amenities at the ORV areas on a phased-in basis, as well as increase law enforcement as funds allow. The specific nature and location of the additional amenities would be determined at a future date, once the fee system is operational.

AL5030 – Alternative Elements: Vehicle Requirements

Concern ID: 44303
CONCERN STATEMENT: One commenter requested that the vehicle size restriction for the resource protection zone be increased to 64 inches in width to allow larger vehicles that are safer.

Representative Quote(s):

Corr. ID: 22 **Organization:** *Not Specified*

Comment ID: 312610 **Organization Type:** Unaffiliated Individual

Representative Quote: Many safety conscious OHV riders have switched from motorcycles and traditional 4-wheelers (ATV) to side by sides (UTV). Safety advantages UTVs have over ATVs are that UTVs have rollover protection and seat belts. Also, UTVs often have a lower center of gravity and are wider than ATVs, which combine to aid in the prevention of rollover accidents. Several of the newer UTVs are 64" wide and this adds significant stability over the narrower and taller 50" models.

Because of this new mindset (many times families and older riders), it is suggested that the width limitations listed in the draft Lake Meredith National Recreation Area Off-Road Vehicle Management Plan be set at 64". A 64" width restriction would still limit larger and much heavier vehicles (Jeeps, sand rails, dune buggies, rock crawlers, etc.) while allowing safety conscious riders to use their UTVs in these areas.

RESPONSE: Based on the review of public comments, the NPS has reevaluated the vehicle size restriction within the resource protection zone. This restriction has been modified to a 64-inch wheel width (not wheel base). This change has been made in the final plan/EIS.

AL5035 – Alternative Elements: Equipment Requirements

Concern ID: 44785
CONCERN STATEMENT: One commenter expressed concern that a requirement for flags on motorcycles could result in safety issues.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 317163 **Organization Type:** Unaffiliated Individual

Representative Quote: I am against the requirements for flags on motorcycles as this poses a serious imminent danger to the rider during riding.

RESPONSE: As shown in the Alternative Elements Summary (table 2 in chapter 2 of the final plan/EIS), the preferred alternative (alternative D) would require flags on ATVs, but would not require flags on motorcycles. The NPS agrees there are safety concerns with such a requirement.

AL5040 – Alternative Elements: Speed Limits

Concern ID: 44304

CONCERN STATEMENT: One commenter requested that there be no speed limits set, except for around large camping areas.

Representative Quote(s):

Corr. ID: 74 **Organization:** *Not Specified*

Comment ID: 313090 **Organization Type:** Unaffiliated Individual

Representative Quote: A speed limit only around a large camping area. This place is normally packed when we are there. No speed limits for the river bed and trails away from the camping area.

RESPONSE: Objectives of this plan include managing ORV use to minimize conflicts among different ORV users and promoting safe operation of ORVs and safety of all visitors. The NPS has chosen to include speed limits in certain areas under the range of alternatives to increase safety and meet these plan objectives.

AL5045 – Alternative Elements: Permit Requirements

Concern ID: 44305

CONCERN STATEMENT: Commenters voiced support for a fee permit, contingent upon those funds being used to provide additional improvements in the ORV areas and to provide more areas for ORV use. Another commenter requested that fees be used to increase enforcement in the area. Commenters suggested alternate permitting fee structures, including allowing four ORVs for $100.

Representative Quote(s):

Corr. ID: 1 **Organization:** *Not Specified*

Comment ID: 310276 **Organization Type:** Unaffiliated Individual

Representative Quote: i like the use of a permit for the atvs/utvs. the nps needs the monies generated to help cover the costs of investment into the recreational areas. good examples are the outhouses at blue creek. too bad we have some folks that destroy the equipment and don't pick up trash after themselves which makes it harder on those of us who do clean up our trash and theirs. anyways, would the $40 permit be per machine? i mean, the average number of family members is 4 and all 4 members would fit inside of a boat. so, would we get a prorate on the permit and get a $100 permit to cover 4 machines/atvs? single machine permits could be $40, 2 @ $65, 3 @ $85, or 4 @ $100?

Corr. ID: 29 **Organization:** Texas Off Roaders Association
Comment ID: 312853 **Organization Type:** Unaffiliated Individual

Representative Quote: Most every ORV area around the State of Oklahoma have a usage / gate fee, which I believe is the only way to have it. This fee, in my opinion, not only helps keep the areas clean but provide the revenue to promote future projects and enhance the beauty of the park.

Corr. ID: 53 **Organization:** MUDD INC.
Comment ID: 312901 **Organization Type:** Unaffiliated Individual

Representative Quote: We as a group "MUDD INC" and our family's do our best to keep it clean and take care of it so that we can keep it, please don't allow the bad eggs that trash it and don't care of it ruin it for all of us, we would like to see some policing of the property even if it means a daily, weekend, or yearly fee, within reason. We are already buying an off-road permit or sticker and that money is being sent to other parks that we don't benefit from. Keep our money local and improve our facilities.

RESPONSE: As stated in the plan/EIS (chapter 2, alternative D), the NPS preferred alternative would implement a permit fee system. Fees from this permit would be used to enhance amenities at the ORV areas on a phased-in basis, as well as increase law enforcement as funds allow. In regards to the specific price of a permit, the numbers in the plan/EIS provide a general idea of what a permit fee could be, but the actual fee could vary. Various permit fee structures proposed by commenters, including having one permit fee for multiple vehicles, would be considered when the permit fee is determined but are outside the scope of this planning process.

Concern ID: 44306

CONCERN STATEMENT: Commenters expressed concern with having a permit system. These concerns included not realizing any improvements as a result of the permit fee and the potential for a user capacity to be established. One commenter suggested that the recreation area request a portion of the state decal fees, which ORV users are already paying, rather than instituting an additional fee.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313167 **Organization Type:** Unaffiliated Individual

Representative Quote: As both a boater who paid annual boat fees to use Lake Meredith and ORV fees to the State of Texas, I have seen no increased benefits associated with said fees. I am fearful that there will not be any realized improvements associated with the ORV fee. Most of the time fees collected by the government agency are deposited in the general coffers. If a park wants to perform improvements, they generally have to compete against other facilities for the same monies. Most of the time the collected fee never makes its way back to the area that is being used.

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313161 **Organization Type:** Unaffiliated Individual

Representative Quote: One of my biggest objectives is a user fee and potential quota system being established. The proposed user fee of $40/ORV is exorbitant and will cause me and others to seek private riding areas. Once a permit system is established the next order of business by the NPS would be to limit the number of

users to the "user capacity" of the area, whatever that may be. I fear that the NPS would establish a "carrying capacity" for the area and the number of annual permits would then be limited and the remainder of park users would be left out of recreation opportunities.

Corr. ID: 74 **Organization:** *Not Specified*
Comment ID: 313092 **Organization Type:** Unaffiliated Individual

Representative Quote: We already pay $16 per OHV for an OHV decal, we shouldn't have to pay a day use fee. Maybe you can get a cut of the OHV decal fees from the state.

RESPONSE: As stated above under Concern ID 44305, the NPS must use funds generated from ORV permits for management of ORV use, which includes providing additional amenities for ORV users, increasing law enforcement of ORV areas, and monitoring ORV use.

In regards to the NPS obtaining a portion of state sticker fees rather than instituting a new fee, there is currently not a mechanism in place that provides for transfer of funds between the federal and state levels. However, the NPS can apply for grant funds from the state to assist with management. The NPS would continue to look for opportunities to apply for such funding.

AL5050 – Alternative Elements: Designated Vehicle Routes/Areas

Concern ID: 44307

CONCERN STATEMENT: Commenters suggested providing trail maintenance of ORV routes. In addition, they suggested closing certain areas for a year to allow regeneration or recovery in the area and reopening them the next year, provided that the public would be well informed.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313174 **Organization Type:** Unaffiliated Individual

Representative Quote: Lastly, and perhaps most importantly to all parties concerned, I think some trail management could be beneficial. Some of the trails and roads in general are in very poor condition. A little trail maintenance and education could help to reduce or eliminate trail abuse. By rotating out some of the trails and giving nature a chance to rehabilitate herself, we could prolong the availability of this unique ORV area. I would be in favor of establishing motorcycle only trails, motorcycle/ATV only trails, jeep trails, and perhaps even some designated rock crawling trails. If the NPS better enforced the existing laws, we wouldn't have as much illegal activity as we have now, and probably wouldn't even need this drastic of a management plan. There are existing laws that can protect the environment now without the need for additional rules and regulation, such as fines for destroying natural resources, but they must be enforced. Let's use the tools that we already have.

Corr. ID: 74 **Organization:** *Not Specified*
Comment ID: 313091 **Organization Type:** Unaffiliated Individual

Representative Quote: Maybe instead of losing routes and areas at a moments notice, close a certain area(s) for a year and reopen the following year. Make sure to provide education materials on the board as to which areas are closed.

RESPONSE: As stated in chapter 2 of the plan/EIS, "The national recreation area may temporarily close ORV routes and areas if resource conditions warrant. This could include closing areas that become overly rutted or closing an area after heavy rains to prevent resource damage. Once the resource condition has been corrected or conditions improve, the area would be reopened to ORV use." The ability to temporarily close ORV routes would allow for natural regeneration in areas where non-designated trails have been created. The NPS would do this on an as-needed basis, rather than on a set rotation schedule as suggested by the commenter, to ensure trails or areas are not reopened before the impacts have been mitigated. Due to the environmental conditions of the area (wind, soils, water availability) one season may not be adequate for an area to have adequate regeneration. In addition, the routes in the plan will be incorporated into the special regulation governing ORV use at the recreation area, and set routes will allow for enforcement and understanding of that regulation. In regards to trail maintenance, where designated trails exist, the NPS will maintain those trials.

Concern ID: 44309

CONCERN STATEMENT: One commenter stated that the plan should not include limited river crossings because of the ever-changing nature of the river system. The commenter also stated that limited crossings would create point sources of water and soil contamination and that river crossings have not been shown to impact the Arkansas River shiner.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313162 **Organization Type:** Unaffiliated Individual

Representative Quote: The next issue is limited river crossing abilities. The Canadian River is an ever-changing river system that redefines its stream course with every precipitation event. It is absurd to envision only a few defined areas to cross this river. Furthermore, if crossings are limited to a few defined areas, then the NPS will have created point sources of potential water and soil contamination and impact. It is better to spread out the potential impact to the environment over many more less frequently used crossings than it is to concentrate all of the traffic to one or two areas. Vehicles and river crossings have never been directly documented as impacting the Arkansas River shiner along the NPS segment of the Canadian River. The Canadian River has become an ephemeral stream due to the dam at Ute Lake in New Mexico and persistent regional drought conditions. The lack of stream flow and the total absence of water in the Canadian River have the biggest impacts on the Arkansas River Shiner, its habitat, and any other river biota.

RESPONSE: The Arkansas River shiner tends to be located primarily in the downstream pools of large transverse ridges of shallow rivers (TransCanada 2012). Designated river crossings for ORVs will be located in shallow, low-banked stretches of the river

where pools and shiner habitat are unlikely to occur. Due to the changing nature of rivers in the area, river crossings will be clearly marked and will be subject to change per the superintendent's authority with consultation provided by the USFWS. Additionally, if monitoring shows that river crossing areas are experiencing point source impacts on water and soil as a result of ORV use, management actions will be put into place to address these impacts.

Concern ID: 44310

CONCERN STATEMENT: One commenter felt that the designation of routes would be confusing for users. The commenter noted that at the public meeting, information was provided concerning routes that were not on the map, and that the conflicts between the information in the meeting and what was in the draft plan/EIS were confusing.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313158 **Organization Type:** Unaffiliated Individual

Representative Quote: Currently, there is no shortage of regulation or rules governing ORV use in the LMRA, so implementing additional rules will serve no beneficial purpose nor will it accomplish what those on the books now have failed to do. It is imperative to enforce the laws that we currently have. Quite frankly, the three remaining alternatives (B,C,D) are rather convoluted and misunderstood by the layman recreationalist, as well as the NPS rangers themselves. During the March 2013 public meeting in Amarillo, a lack of knowledge and understanding of the proposed Alternatives on the part of the NPS staff led to confusion for the many user groups that were represented. Mr. Paul Jones of the NPS indicated that many trails he personally GPS'd were not represented on the maps for Alternatives B, C, and D. He indicated that all those trails would be accessible. However, according to the Draft EIS currently being proposed, none of those are shown as active ORV trails. In fact, the maps represented in the various alternatives are all maps that were in the 2010 or earlier LMRA ORV Management Plan, so there is no expectation that these differences are going to be incorporated in the final plan. We as users cannot take the NPS Rangers' verbal interpretation of the various alternatives, but yet can only look to the facts as they are presented in the EIS. We cannot expect anything else promised verbally, and misunderstanding on the part of the NPS representatives only compounds the problem.

RESPONSE: The maps provided at the public meeting, as well as in the plan/EIS, provide an accurate representation of allowable ORV routes under the preferred alternative. While the NPS apologizes for any misunderstanding of these routes, the maps included in the draft plan/EIS are accurate and are included in the final plan/EIS.

AL5055 – Alternative Elements: Zone System

Concern ID: 44311

CONCERN STATEMENT: Commenters suggested that different types of trails and zones be created for different types of users, with motorcycles provided as one example of a use that should be separated out.

Representative Quote(s):

Corr. ID: 43 **Organization:** *Not Specified*

Comment ID: 312886 **Organization Type:** Unaffiliated Individual

Representative Quote: Motorcycles should be in a category all there own, and not jumbled into a generic ATV category. Riders are much more susceptible to injury by other vehicles much larger than them. Motorcyclist need room on the outskirts and need to keep there trails small and single tracks. Ideally there should be a "Motorcycle Only" area large enough to keep everyone happy.

However, it is impossible to keep everyone happy so if I had to choose plan A or B, I would choose "A"

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313159 **Organization Type:** Unaffiliated Individual

Representative Quote: Rather than pick and choose my likes and dislikes from the various alternatives being proposed, I will sum up my desires for recreational uses in the Rosita Flats area of the LMRA as follows:

4. Develop different types of user trails (ie. Motorcycles, atvs, jeeps, trucks, etc.) and rotate trail use

Corr. ID: 72 Organization: *Not Specified*
Comment ID: 313164 Organization Type: Unaffiliated Individual

Representative Quote: I am in favor of a designated trail system. I would like to see trails designated for: motorcycle only, motorcycle/atvs, jeeps, regular vehicles, and open-to-all trails. By establishing these specific trail types, I believe the safety of riders could be enhanced. Rotating these trails in and out of service will help to protect the potential for erosion and degradation as well. I am for a designated campground and quiet-time restrictions.

RESPONSE: Currently, and under all alternatives, there are routes that lend themselves to motorcycle use because of their narrow nature. At least one of these routes cannot be widened because of trees and other topography. Because of this, the route is only suitable for motorcycle use. This route, along with the others, is located in Rosita Flats, east of Bull Taco Hill in the floodplain, just outside of the river. Under all alternatives, these routes would still be available, and most would be conducive to motorcycle use. In regards to other designated trails for specific vehicle types, the NPS believes that due to the variety of trails available, some are more suitable for certain types of vehicles than others, and official designation of these trails for one type of vehicle is not necessary at this time.

Concern ID: 44312

CONCERN STATEMENT: Commenters expressed concern with a zone system, stating that this would increase the number of riders in a single area and result in more accidents. They also expressed concern about the resource protection area, stating that it is too restrictive as proposed due to the vehicle width limitation and the length of the restriction.

Representative Quote(s):

Corr. ID: 6 **Organization:** American Motorcyclist Association
Comment ID: 310287 **Organization Type:** Recreational Groups

Representative Quote: Furthermore, we do not believe the DEIS takes into account the safety and environmental impacts, such as trail congestion and overuse, from forcing riders into a smaller designated area.

Corr. ID: 24 **Organization:** *Not Specified*
Comment ID: 312612 **Organization Type:** Unaffiliated Individual

Representative Quote: Placing restrictions on the riding areas will only increase the number of riders forced to ride in the same area which could lead to more accidents and more erosion issues. One of the great things about the area is that it allows people to have some room to avoid collisions. Also, the diversity of the terrain makes riding enjoyable for all levels. Placing motorcycles, 4-wheelers, and dune buggies in the same area would be a big problem, an accident waiting to happen.

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313163 **Organization Type:** Unaffiliated Individual

Representative Quote: The resource protection area is extremely restrictive as it is proposed now. Only vehicles 5' wide or less will be allowed and there is no provision for street legal vehicles in this area. This will limit or even prohibit many hunters from utilizing this area during the general hunting season (or any other times). Many hunters, including myself utilize our street legal vehicle to access prime hunting areas within the Rosita Flats area. Under these alternatives, street legal vehicles will not be allowed. Additionally, ORV (besides those used in hunting activities) use will not be allowed during the hunting season(s) in this resource protection area. This is a period of up to 2 months each year. I have hunted all my life in this area, and while I do encounter ORV during hunting hours, I have never lost the opportunity to harvest an animal due to an ORV. I have been discouraged by their presence from time to time, yet I do NOT want to restrict their use during this time. The LMRA and particularly, the Rosita Flats is public property for ALL to enjoy year round.

Corr. ID: 72 **Organization:** *Not Specified*
Comment ID: 313160 **Organization Type:** Unaffiliated Individual

Representative Quote: There are many different user groups that frequent the Rosita Flats area, hunters, motorcyclists, atvs, dune buggy, jeeps, rock crawlers, campers, hikers, etc. Some of these users are actually multi-use recreationalists, such as myself. I enjoy and participate in almost every one of these activities, however all three alternatives being proposed (B,C,D) will conflict with one or more of the activities in which I participate. First and foremost is the desire for a safe recreation area. It is my intent every time I visit the LMRA to come home safely. To help facilitate that, more NPS presence is needed in the Rosita Flats area.

Corr. ID: 79 **Organization:** PEA
Comment ID: 313121 **Organization Type:** Unaffiliated Individual

Representative Quote: BUT IT IS IMPERATIVE that beware that the smaller the area for riding the higher the risk is for getting hurt.. Put that into consideration before you even think about taking Canadian river.

RESPONSE: The NPS believes that implementation of a zoning system will better enhance and protect the recreation area's resources. The Organic Act gives the NPS broad authority and discretion to manage the sometimes conflicting goals of resource conservation and visitor enjoyment and to determine how visitor activities, including recreational activities, may be managed to avoid or minimize impacts to natural and cultural resources. The express language of the Organic Act does not mandate that NPS equally balance resource protection with public use in making its management decisions. Courts have held that the Organic Act places an overarching concern on protection of resources in the management of national parks. Since the act speaks of but a single purpose, conservation, where the goals of resource protection and user enjoyment conflict, protecting the resources takes precedence. Thus, the NPS interpretation of the Organic Act as allowing the recreation area to manage appropriate recreational uses in the interest of resource protection is consistent with the act and is a proper exercise of discretion, even if it may result in a concentration of use due to the implementation of a zone system.

Further, although the zoning system may restrict use in some areas to certain vehicle types, it still allows for use within the zones that promote visitor safety, such as the beginner zone or hunting zone. The NPS believes that the safety benefits created from these zones outweighs some of the crowding concerns of commenters. Addressing commenters' concerns in the resource protection zone, the NPS has revised the size restriction to vehicles with no more than a 64-inch wheel width (not wheel base) to allow for additional use in that area. This decision is reflected in the final plan/EIS.

AL5065 – Alternative Elements: Education and Outreach

Concern ID: 44313

CONCERN STATEMENT: One commenter requested that bigger signs be placed at entrances to inform users of the rules.

Representative Quote(s):

Corr. ID: 1 **Organization:** *Not Specified*

Comment ID: 310277 **Organization Type:** Unaffiliated Individual

Representative Quote: bigger signs would need to be placed at the entrances for potential riders to see what the rules are, what permits are required, etc….

RESPONSE: As stated in chapter 2 of the plan/EIS, the preferred alternative (alternative D) includes multiple education and outreach elements to inform users of the rules at Rosita Flats and Blue Creek. One mechanism for education and informing users of the rules is the proposed fee permit system, which would require that people requesting a permit receive education prior to obtaining a permit. Other education and outreach, beyond what the recreation area is already implementing, would include

- Providing safety literature and trash bags to users. ORV and other rules could be printed on the trash bags. Rangers seek out visitors and provide this information and increase visitor contacts

- Providing ORV safety programs in schools and attend Fritch Howdy Neighbor Day.
- Increasing education about ORVs at community events the national recreation area staff attends.
- Adding ORV education to Water Safety Day.
- Providing signs to local businesses containing Lake Meredith National Recreation Area ORV use area map and rules.
- Increasing educational signs in ORV use areas.
- Establishing a volunteer group to assist with cleanup and other efforts.
- Developing a "tread lightly" pamphlet for ORV use.

The NPS believes these measures would be effective and that bigger signs at the entrances would not be required.

AL6000 – Alternatives: Alternative A

Concern ID: 44314

CONCERN STATEMENT: Commenters requested that alternative A be implemented, with modifications to include increased outreach and enforcement.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313157 **Organization Type:** Unaffiliated Individual

Representative Quote: It is my strong and researched opinion that the NPS should continue to operate the LMRA just as it is now; with minor exceptions. Those minor exceptions can be broken down into two areas: Education and Enforcement. Both of these are lacking in sufficient quantities in the Rosita Flats area of the LMRA. My preference, as well as almost every user of the LMRA, would be to implement Alternative A, which is a no-action alternative. I understand from reading the Draft EIS that the NPS has ruled this option out, as was also indicated by Mr. Paul Jones of the NPS during a March 2013 public comment meeting.

RESPONSE: Implementation of alternative A, even with additional outreach and enforcement, is not likely to bring the recreation area into compliance with Executive Orders 11644 and 11989 respecting ORV use, and with NPS laws, regulations (36 CFR 4.10), and policies to minimize impacts to recreation area resources and values. In particular, Executive Order 11644 requires that the location of routes minimize damage to soil, watershed, vegetation, or other resources of the public lands; minimize harassment of wildlife or significant disruption of wildlife habitats; minimize conflicts between ORV use and other existing or proposed recreational uses of the same or neighboring public lands, and ensure the compatibility of such uses recreational uses of the same or neighboring public lands. ORV routes may be located in areas of the national park system only if the respective agency head determines that ORV use in such locations will not adversely affect their natural, aesthetic, or scenic values. Alternative A, even with additional law enforcement and education, does not effectively minimize damage to soils, vegetation, wildlife, and wildlife habitat and therefore does not protect the natural values of the area as well as the action alternatives.

AL7000 – Alternatives: Alternative B

Concern ID: 44315

CONCERN STATEMENT: Commenters expressed concern with the implementation of a multi-use trail under alternative B, questioning whether demand existed for such a use.

Representative Quote(s):

Corr. ID: 17 **Organization:** *Not Specified*

Comment ID: 312602 **Organization Type:** Unaffiliated Individual

Representative Quote: Alternative B which includes the Multi-Use Trail (Hike/Bike) @ the Alibates & Fritch Fortress areas is just plain bizarre. NPS could have implemented this trail system without interfering with OHV activities at the Canadian River area long before now. Equestrian activities have been seen at the Canadian River since before our Family started going in the late 1960's.

That said, has anyone actually run a marketing analysis for demographics for the proposed Multi-Use trail system? Does NPS actually believe the outdoor enthusiasts from Amarillo (largest urban area) will drive over an hour to hike or ride their bicycles when Palo Duro Canyon is one of the most epic hiking/riding places in the state…and 20-min from Amarillo?

RESPONSE: None of the alternatives for the ORV management plan/EIS include development of a multi-use trail. The recreation area recently completed a separate planning process for a multi-use trail in January 2010. The multi-use trail would consist of five phases of primitive trails totaling approximately 22 miles in length and would be available for pedestrian and bicycle use. Phase 1 would be located in the Harbor Bay and Fritch Canyon area; phase 2 would be between Harbor Bay and Short Creek; phase 3 would be located between Short Creek and South Turkey Creek; phase 4 would start at the mouth of South Turkey Creek and continue up the canyon; and phase 5 would be located between Fritch Fortress and the northern portion of phase one. None of these areas coincide with the ORV areas, and planning for this multi-use trail is outside the scope of the ORV management plan/EIS.

Concern ID: 44316

CONCERN STATEMENT: One commenter requested that the NPS clarify the purpose of the no-cost permit under alternative B, specifically what type of educational purpose the permit would serve.

Representative Quote(s):

Corr. ID: 116 **Organization:** US Environmental Protection Agency – Region 6

Comment ID: 315686 **Organization Type:** Federal Government

Representative Quote: Executive Summary, Page xi – Alternative B includes issuing a no-cost permit for educational purposes, but it is unclear what educational purpose the permit would fulfill. The only education mentioned in the DEIS is through outreach with ORV users via bulletin boards and brochures, and the permits mentioned in the DEIS are for identifying ORV area users. These two measures are common to alternatives B, C, and D.

RESPONSE: The no-cost educational permit would inform users of the rules and regulations of the national recreation area, as well as provide information on the sensitive resources in the ORV area. As stated in chapter 2 of the plan/EIS under alternative B, “To obtain the permit, ORV owners would be required to read education

materials and sign for their permits. By signing for permits, users would be acknowledging they have read, understood, and agreed to abide by the rules of ORV use in the national recreation area. The signed permit materials must be kept in the vehicle being used in the national recreation area." The NPS believes that a no-cost educational permit will ensure all users have applicable information related to rules, regulations, and resource conditions and increase compliance in these areas. In addition, a no-cost permit will also provide the NPS with a tool to better track usage levels in the ORV areas.

Concern ID: 44317

CONCERN STATEMENT: One commenter asked how the NPS would enforce the alternatives and also asked why, if ORVs are threatening the Arkansas River shiner, use is allowed primarily in the riverbed.

Representative Quote(s):

Corr. ID: 74 **Organization:** *Not Specified*

Comment ID: 313084 **Organization Type:** Unaffiliated Individual

Representative Quote: I do agree that some changes need to be made but after looking at the map (Figure 7: Alternative B: Rosita Flats Off-Road Vehicle Use Area in Chapter 2), I wonder how you are going to enforce this. It is very confusing. In chapter 1, It says that OHV's are threatening the Arkansas Shiner (a minnow), but the map in Chapter 2 says all riding should be done in the sandy bottoms, aka, the river bed (except for a few marked trails). It will cost more money and manpower to keep people out of the other marked trails.

RESPONSE: The intent of the alternatives is to allow driving in the riverbed, when the river is dry and the habitat for the Arkansas River shiner is not present. Alternative D includes provisions to protect the shiner, including a restriction on driving in isolated pooled areas of water that may contain shiner habitat. The NPS currently manages the ORV areas and will continue to do so under all alternatives. The preferred alternative includes a permit fee, which would help provide additional funds for increased enforcement.

AL8000 – Alternatives: Alternative C

Concern ID: 44318

CONCERN STATEMENT: One commenter requested that the NPS provide a rationale for closing the area east of Bull Taco Hill to ORV use. Further, if the closure is proposed for resource protection, the commenter requested an explanation as to why this element was not included in other alternatives.

Representative Quote(s):

Corr. ID: 116 **Organization:** US Environmental Protection Agency – Region 6

Comment ID: 315687 **Organization Type:** Federal Government

Representative Quote: Alternative C, Page 52 – Implementation of Alternative C would close the area east of Bull Taco Hill to all ORV use. The rationale for this action is never fully explained. Describe why closing down the area East of Bull Taco Hill was included in Alternative C. If this action was based on the need to protect natural or cultural resources; then explain why this action was not included in the other action alternatives.

RESPONSE: The NPS considered closing the area east of Bull Taco Hill under alternative C, but not other alternatives, as part of the range of alternatives. It was not part of the preferred alternative (alternative D). In consultation with the USFWS, it was determined that ample areas for ORV use outside of the riverbed should be provided to prevent overuse of the riverbed area. Based on this consultation, the NPS determined that keeping the area open for use and allowing a greater dispersal of use would be preferable to closing the area completely. Although alternative D does not close that area, it does include a resource protection zone (not included under alternative C) that would restrict vehicles of a certain size and provide for increased resource protection. Therefore although there is not a complete closure of the area east of Bull Taco Hill under alternative D, it does have other resource protection measures not present in alternative C.

AL9000 – Alternatives: Alternative D

Concern ID: 44319

CONCERN STATEMENT: One commenter expressed concern that alternative D could encourage illegal riding.

Representative Quote(s):

Corr. ID: 6 **Organization:** American Motorcyclist Association

Comment ID: 310285 **Organization Type:** Recreational Groups

Representative Quote: According to the preferred plan (alternative D), the NPS intends to limit OHV access to a fraction of the area previously allowed. Additionally, the plan would require individual permits for different zones in the park, further complicating access for individuals and families who wish to take part in multiple activities per trip. Also, that requirement could potentially encourage illegal riding.

RESPONSE: The NPS recognized the potential for illegal use under any of the alternatives presented in the plan/EIS. To address this, the preferred alternative includes a fee permit system in which funds generated from the permits must be used for ORV amenities or management, including law enforcement. If a rider were found off designated trails, the NPS would recommend to the courts that the permit be revoked for the remainder of the year. If a rider violates the rules in either of the ORV use areas (Rosita Flats and Blue Creek) three times, the national recreation area would recommend to the court permanent suspension of their permit privileges. ORV users driving off-road and damaging park resources may be required to pay for those damages pursuant to federal law. In addition, if illegal use were occurring in a certain area and resulting in resource damage, that area could be closed until that area has recovered from the damage. Although illegal use is a possibility, alternative D would provide the NPS with the tools to address that use.

Concern ID: 44320

CONCERN STATEMENT: Commenters stated support for alternative D, but requested that it be modified to allow for a lower ORV permit fee, increase fines for littering, provide more trash pickups, and phase in any noise level restrictions.

Representative Quote(s):

Corr. ID: 39 **Organization:** *Not Specified*

Comment ID: 312882 **Organization Type:** Unaffiliated Individual

Representative Quote: With this in mind, I recommend that Alternative D of the draft environmental impact statement be implemented for the specific reasons stated below:

1) Instituting permit/fee/regulatory requirements for ORVs would put management of ORV use consistent with management of other activities that impact the natural environment/habitats at LMNRA, thereby allowing:

a. Collection of fees to manage and maintain the area (financial resources are expended regardless of the collection of fees),

b. Consequences for non-compliance with regulations.

2) Because ORV use by definition has the potential to be destructive to the natural environment, within a national recreation area I believe we have a responsibility to manage ORV areas in order to sustain/protect habitats for native and migratory species, as well as for future generations.

3) I believe having zones is a necessary component to allow for enjoyment by multiple users while minimizing opportunities for conflict, and for long-term management of the LMNRA as use changes are necessitated by changes to the natural landscape.

Corr. ID: 91 **Organization:** Track & Trail Sports Riders
Comment ID: 313148 **Organization Type:** Unaffiliated Individual

Representative Quote: I favor Alternative D with following suggestions:

Need more trash pickups during summer months in Rosita Flats or at Highway 287 bridge.

Possible fazed in noise levels in 1 to 2 years.

Possible lower fee for 1 to 2 years of $20 per year.

Corr. ID: 102 **Organization:** *Not Specified*
Comment ID: 313177 **Organization Type:** Unaffiliated Individual

Representative Quote: I am for alternative D, although I do believe that having a much higher fine for littering would be good.

RESPONSE: In regards to noise standards, vehicles manufactured after the late 1990s are all manufactured to meet the noise standard in the plan/EIS. The national off road vehicle association also endorses this standard. Since vehicles meeting the standard have been manufactured for many years, non-modified ORVs should be able to meet the standard.

As noted under Concern ID 44301, the NPS is not responsible for setting fines, but can consider recommending higher fine levels to the courts. Also, the specific fee to be changed for the permit is yet to be determined and will be determined under a separate process, which will take into consideration comments received during the EIS process. The level of amenities provided with those fees, including trash cans and trash pick-up, will be determined at a later date.

AR4000 – Archeology Resources: Impact of Proposal and Alternatives

Concern ID: 44321

CONCERN STATEMENT: One commenter expressed concern that the proposed plan would adversely affect cultural resources and requested a survey to determine the presence of cultural resources in the plan study area.

Representative Quote(s):

Corr. ID: 113 **Organization:** State Historic Preservation Officer

Comment ID: 315682 **Organization Type:** State Government

Representative Quote: We have concerns that the proposed plan will adversely affect these cultural resources. It is also likely that unrecorded cultural resources are located in these areas and we would recommend a survey to determine the presence of additional cultural resources and assessment of new and previously recorded cultural resources.

RESPONSE: The Rosita Flats area was surveyed in 2005. The survey was a Class III survey. The preferred alternative (alternative D) designates routes and areas to avoid sensitive resources, including archeological sites within the two ORV areas. The one site that is located within a designated ORV use area will be protected by a barrier denying access, including access by pedestrians.

CC1000 – Consultation and Coordination: General Comments

Concern ID: 44322

CONCERN STATEMENT: Commenters raised concerns about consultation with the U.S. Fish and Wildlife Service (USFWS), asking whether the USFWS had been consulted during the planning process. One commenter requested that the final plan/EIS include concurrence from the USFWS regarding impacts on threatened and endangered species from the proposed plan.

Representative Quote(s):

Corr. ID: 20 **Organization:** Texasoffroaders

Comment ID: 312607 **Organization Type:** Unaffiliated Individual

Representative Quote: Alternatives B,C,& D, all have the traffic moved to the river bed. Did you guys talk with your counterparts at Fish & Game about the impact on the Arkansas River Shiner if all traffic was directed in that Direction? Did NPS even contact any of the local off roading public and ask for input when the various alternatives were being prepared?

Corr. ID: 116 **Organization:** US Environmental Protection Agency – Region 6

Comment ID: 315688 **Organization Type:** Federal Government

Representative Quote: Agencies, Organizations and Individuals Consulted, page 231 – The DEIS does not contain a final determination of the environmental consequences of the alternatives to threatened and endangered species. The U.S. Fish and Wildlife Service (USFWS) was contacted for threatened and endangered species consultation, but there is not concurrence from the USFWS on any conclusions reached in the DEIS. Include concurrence from the USFWS on the NPS determination for impacts of the proposed project to threatened and endangered species.

RESPONSE: Throughout the development of the plan/EIS, the NPS informally consulted with the USFWS. On May 5, 2014 the NPS received the biological opinion on the NPS preferred alternative. A review of the impacts is included in the biological opinion and the record of consultation is included in attachment 1 of appendix B.

Concern ID: 44323

CONCERN STATEMENT: One commenter requested that the comment period be extended due to the February 25, 2013, blizzard that caused the public meetings to be rescheduled.

Representative Quote(s):

Corr. ID: 20 **Organization:** Texasoffroaders

Comment ID: 312608 **Organization Type:** Unaffiliated Individual

Representative Quote: And it would have been the right thing to do to move the end of the comment period back like the public meetings were because of the recent blizzard on 2/25/2013.

RESPONSE: The NPS places a high value on public input throughout the planning process. To facilitate greater public involvement, the comment period on the draft plan/EIS was 60 days, rather than the required 45 days. During this period, the public was provided with multiple ways to participate; the public meetings were only one method of participating. Commenters could submit comments on line, provide written comments through the mail, or send written comments to park headquarters. The NPS believes the 60-day comment period and multiple methods available to comment provided ample opportunity for comments during this planning process.

Concern ID: 44324

CONCERN STATEMENT: One commenter requested more information regarding the Tribal consultation conducted by the park, and suggested additional Tribal consultation.

Representative Quote(s):

Corr. ID: 116 **Organization:** US Environmental Protection Agency – Region 6

Comment ID: 315689 **Organization Type:** Federal Government

Representative Quote: Tribal Concerns, Page 232 – The DEIS lists ten Tribes that were contacted during the development of the plan, but does not indicate whether they were contacted for government-to-government consultation under E.O. 13175, National Historic Preservation Act 9NHPA) consultation, or other reasons. Information, responses, and concerns to/from the listed Tribes were not specified in the DEIS, nor was there any indication of communication with Texas Tribes; including the Kickapoo Traditional Tribe, Ysleta Del Sur Pueblo, Alabama-Coushatta Tribe, and the Tonkawa Tribe. All of these tribes may have an interest in the proposed project location. Provide information in the Final EIS to document that all potentially affected Tribes were identified and contacted for both NHPA and E.O. 13175. The Texas State SHPO should also be contacted to provide concurrence on the conclusions reached in the DEIS concerning historic, cultural, or archeological resources. EPA recommends that the NPS continue to communicate and consult with the Tribes as the project progresses.

RESPONSE: The tribes listed in chapter 5 of the plan/EIS were sent a Notice of Intent letter to initiate government-to-government consultation under Executive Order 13175. Of the 10 letters sent, no responses were received. In regards to the tribes specifically mentioned by the commenter, these tribes do not have a historical association with Lake Meredith National Recreation Area, and therefore were not contacted as part

of this process. The Texas State Historic Preservation Officer was sent a letter on July 1, 2014 informing the NPS that they concurred with their determination of no effect. Further information on the consultation is provided in Chapter 5.

GA1000 – Impact Analysis: Impact Analyses

Concern ID: 44325

CONCERN STATEMENT: One commenter stated that the description of actions that could have cumulative impacts was flawed, specifically the descriptions of the mud bog and sand drags events. The commenter provided information to correct the statements they felt were incorrect.

Representative Quote(s):

Corr. ID: 81 **Organization:** West Texas Outlaws Off Road Club

Comment ID: 313127 **Organization Type:** Unaffiliated Individual

Representative Quote: I read the 2013 draft from cover to cover and found myself appalled at the cost and effort paid for by the taxpayer to conduct this study which is incomplete, inaccurate and obviously skewed to the park service view. Looked like most of the consultants weren't even from Texas (think Pace salsa ad) Some of the inaccurate views are about the sand drags (a generic term since there hasn't been an organized race event for the past 2 years) 10,000 visitors showed up the last full weekend of February regardless of the mass gathering restrictions and the increased law enforcement, not to view the "races" but because it is tradition.

One statement which really upset me was on page 127.

1. The West Texas Outlaws have not had a mud bog event for the past two years.

2. The Tejano Buggy Club started the sand drags in the 80's, the WTO did not host the event until 1992 and had only mud bogs from 1996. Other organizations held the sand drags ever since.

3. The mud bog and the sand drags have always been held on state land, not NPS land, NPS gets the spillover campers as stated..

RESPONSE: The plan/EIS describes the Amarillo Sand Drags event as an action that could contribute to cumulative impacts, because the event is located adjacent to NPS lands. To address the commenter's concerns, text in the plan/EIS has been modified as follows (new text is shown as an underline, with deleted text shown in strikeout):

Amarillo Sand Drags—The Amarillo Sand Drags is a competitive ORV drag racing event that began in the 1980s and is hosted by local ORV organizations ~~organized each year by the West Texas Outlaws Off-road Club~~. Held every February, the event attracts thousands of spectators and hundreds of motorcycles, four wheelers, sand rails, and river buggies on state lands adjacent to Rosita Flats. Drivers of these vehicles compete against one another in ORV races. ~~The event uses the Canadian River riverbed in the Lake Meredith National Recreation Area as its location.~~ Although the event itself is held on state-owned lands ~~is contained to the sandy wash of the riverbed~~, the event's increasing popularity has resulted in spill-over effects on parklands outside the main event grounds. There is a substantial increase in visitor use at Lake Meredith associated with this annual event, and this dramatic increase in visitation necessitates greater law enforcement

and park management services, while the increased intensity of ORV use has the potential to negatively affect soils and other natural resources from the spill-over use.

MO4000 – Management and Operations: Impact of Proposal and Alternatives

Concern ID: 44326

CONCERN STATEMENT: Commenters stated that there would not be the funds necessary to implement the alternatives, and suggested that alternative A be implemented because it would cost the least. They also stated that implementing a permit fee would decrease visitation, and that this should be taken into account when considering how permit fees would offset costs.

Representative Quote(s):

Corr. ID: 72 **Organization:** *Not Specified*

Comment ID: 313171 **Organization Type:** Unaffiliated Individual

Representative Quote: I believe the funding needed to implement any of Alternatives B, C, or D will not be granted. With the lack of funding to implement these plans, the LMRA would most likely be closed to visitors. Below is a summary of the costs NPS indicate are required to implement each of the proposed alternatives.

Alternative A $ 315,000
Alternative B $1,775,000
Alternative C $ 442,500 (offset by user permit fees)
Alternative D $1,775,000 (offset by user permit fees)

It doesn't take an advanced degree in finance to see that the least cost option is Alternative A. The remaining alternatives are expensive and likely will face steep challenges in the budgetary request process as every government agency fights for limited funds. As mentioned previously, when a user fee is implemented, visitation will likely decrease substantially, thus the offset costs for these alternatives will not be realized which will further exacerbate the funding crisis.

RESPONSE: Although alternative A may be the least expensive to implement, it does not meet the purpose and need of this planning effort, and it does not address the findings of the Friends of the Earth Lawsuit or applicable executive orders (see Concern ID 44293 for further details).

In regards to obtaining the needed funding, once the planning is completed, and a decision is made, a request for additional funds would occur. Like most federal agencies, the NPS relies on federal appropriations to fund its core activities, although there is increasing use of alternative revenue sources, such as permit fees, to manage special uses. Parks generally obtain project funding either from annual appropriations or recreational fees; however, federal and non-federal grants can be a potential fund source as well. Annual appropriations are obtained directly from Congress. As an agency, the NPS develops an annual budget request that is submitted to Congress for review, modification, and approval. Base funding approved in the operation of the national park system appropriation covers basic operations (operating visitor centers, patrolling park grounds, and maintaining facilities). Other appropriations cover special programs (e.g., funding research, land acquisition, and construction) of the NPS. Lake Meredith would follow this process to obtain the funding necessary to implement the preferred alternative, and funding

would include revenue from permit fees.

Although the commenter notes concerns about decreased visitation with permit fees, this has not occurred with the implementation of the state ORV permit (see Concern ID 44292). Further, the concept of a permit fee was incorporated based on comments from local ORV use groups as well as individuals, and is expected that this fee will not lead to large decreases in visitation.

PN3000 – Purpose and Need: Scope of the Analysis

Concern ID: 44790

CONCERN STATEMENT: One commenter expressed concern that the plan did not provide enough consideration of two-wheel vehicle sports.

Representative Quote(s):

Corr. ID: 30 **Organization:** *Not Specified*

Comment ID: 312855 **Organization Type:** Unaffiliated Individual

Representative Quote: In reviewing the alternatives we have come to the conclusion that any choice other than "A" will deeply curtail out right to enjoy the land in a responsible way that includes our hobby of Off Road dirt bikes, in-fact from what I can tell the plans will increase the danger associated with any 2 wheel hobby to the point of not worth the risk. We currently have enough trail options to ride without interference from other off road enthusiast. From the conversations at the Amarillo meeting, it became painfully clear, 2 wheel sports have been given no real consideration. If you run the off roaders away from the area, I promise the only users of the area will be an element you are not currently prepared to handle. Palo Duro and Caprock offer much more suitable mountain biking and camping. The river will not draw those users to itself, but the drug users and dog trainers will.

RESPONSE: This ORV management plan/EIS was developed to address all ORVs operating in Rosita Flats and Blue Creek, and does not differentiate between different types of ORVs, including two-wheeled vehicles.

Currently, and under all alternatives, there are routes that lend themselves to two-wheeled vehicle use because of their narrow nature. These routes are located in Rosita Flats, east of Bull Taco Hill in the floodplain, just outside of the river. Under all alternatives, these routes would still be available, and most conducive to two-wheeled vehicle use; however, they would not be explicitly designated only for this use.

PN4000 – Purpose and Need: Park Legislation/Authority

Concern ID: 44327

CONCERN STATEMENT: One commenter stated that the local community was kept out of the planning process, specifically because of the lack of public notification regarding the lawsuit filed by Friends of the Earth.

Representative Quote(s):

Corr. ID: 20 **Organization:** Texasoffroaders

Comment ID: 312606 **Organization Type:** Unaffiliated Individual

Representative Quote: Concerning the proposed alternatives that the NPS has given the "stakeholders" in the Amarillo area I must vote for A, No Action. My

reasoning for doing so is that the NPS has kept the local area users out of the decision making process as long as they possibly could. Why was the public at large in the Texas Panhandle not informed about the lawsuit that The Friends of the Earth filed pertaining to the Rosita Flats recreation area north of Amarillo. I think the NPS didn't want any organized local opposition putting up a fight to keep Rosita Flats open to the off-roading public.

RESPONSE: Lake Meredith National Recreation Area has continually involved the public in the ORV management decision making process. See chapter 5 of the plan/EIS for a description of how the park has involved the public in the process.

Lake Meredith was one of a number of parks listed in the Friends of the Earth v. U.S. Department of the Interior, No. 1:05-CV-2302 lawsuit. As a general practice, the NPS does not announce when a lawsuit has been filed against itself.

TE4000 – Threatened and Endangered Species: Impact of Proposal and Alternatives

Concern ID: 44328

CONCERN STATEMENT: One commenter suggested that drought was impacting the Arkansas River shiner more than ORV use.

Representative Quote(s):

Corr. ID: 47 **Organization:** *Not Specified*

Comment ID: 312893 **Organization Type:** Unaffiliated Individual

Representative Quote: This area is suffering from a drought so I don't imagine there is much chance of the Shiners suffering from off road vehicles.

RESPONSE: As stated above Concern ID 44295, the NPS protects resources, regardless of impacts from other sources, such as natural occurrences (including drought). In particular, the Arkansas River shiner is listed as threatened by the USFWS. NPS *Management Policies 2006* (section 4.4.2.3) states that "The Service will survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act. The Service will fully meet its obligations under the NPS Organic Act and the Endangered Species Act to both proactively conserve listed species and prevent detrimental effects on these species." To meet the above obligations, the management policies direct the NPS to "conduct actions and allocate funding to address endangered, threatened, proposed, and candidate species." The policies further indicate that "the National Park Service will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible. In addition, the Service will inventory other native species that are of special management concern to the parks (such as rare, declining, sensitive, or unique species and their habitats) and will manage them to maintain their natural distribution and abundance." Based on this policy guidance, the ORV management plan/EIS includes measures to further the protection of the Arkansas River shiner.

CORRESPONDENCE FROM ORGANIZATIONS

Correspondence ID	Date received	Organization Type	Organization
6	2/20/13	Recreational Groups	American Motorcyclist Association
113	3/6/13	State Government	State Historic Preservation Officer
116	3/25/13	Federal Government	U.S. Environmental Protection Agency

INDEX BY ORGANIZATION

(04/10/2013)

Federal Government

US Environmental Protection Agency – Region 6 – 116; AE10060 – Affected Environment: Issues Considered but Dismissed. AL7000 – Alternatives: Alternative B. AL8000 – Alternatives: Alternative C. CC1000 – Consultation and Coordination: General Comments.

Recreational Groups

American Motorcyclist Association – 6; AE10060 – Affected Environment: Issues Considered but Dismissed. AL2011 – Alternatives: Oppose ORV Restrictions (Non-substantive). AL5055 – Alternative Elements: Zone System. AL9000 – Alternatives: Alternative D.

State Government

State Historic Preservation Officer – 113; AE15000 – Affected Environment: Archeology Resources. AR4000 – Archeology Resources: Impact of Proposal and Alternatives.

Unaffiliated Individual (If organization is listed, the individual is not an official representative of that organization)

AMA – 85; AE10060 – Affected Environment: Issues Considered but Dismissed. AE2000 – Affected Environment: Soils. AL6400 – Alternatives: Support Alternative A.

AMA – 90; AL6400 – Alternatives: Support Alternative A.

Amarillo Off Road Association – 44; AL5046 – Alternative Elements: Permit Requirements (Non-substantive).

avid off-roader with kids! – 14; AL5045 – Alternative Elements: Permit Requirements. AL5056 – Alternative Elements: Zone System (Non-substantive). AL6400 – Alternatives: Support Alternative A.

High Plains Offroad – 69; AL6400 – Alternatives: Support Alternative A.

JUST A PRIVATE CITIZEN – 7; AL6400 – Alternatives: Support Alternative A.

Local resident – 95; AL4000 – Alternatives: New Alternatives or Elements.

Mass Carnage Offroad – 50; AL6400 – Alternatives: Support Alternative A. AL7600 – Alternatives: Oppose Alternative B. AL8600 – Alternatives: Oppose Alternative C. AL9600 – Alternatives: Oppose Alternative D.

motor cycle riders – 75; AL6400 – Alternatives: Support Alternative A.

Mudd Inc – 60; AL2000 – Alternatives: Support ORV Access (Non-substantive).

MUDD INC. – 53; AL5045 – Alternative Elements: Permit Requirements. VU4005 – Visitor Use and Experience / Health and Safety: Impact of Proposal and Alternatives (Non-substantive).

MUDD INC. – 55; AL2000 – Alternatives: Support ORV Access (Non-substantive).

Mud inc – 93; VU4005 – Visitor Use and Experience / Health and Safety: Impact of Proposal and Alternatives (Non-substantive).

Mx – 84; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

N/A – 1; AL1001 – Alternatives: Elements Common to All Alternatives (Non-substantive). AL2000 – Alternatives: Support ORV Access (Non-substantive). AL4000 – Alternatives: New Alternatives or Elements. AL5010 – Alternative Elements: Monitoring and Enforcement. AL5045 – Alternative Elements: Permit Requirements. AL5046 – Alternative Elements: Permit Requirements (Non-substantive). AL5065 – Alternative Elements: Education and Outreach.

N/A – 2; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 4; AL2011 – Alternatives: Oppose ORV Restrictions (Non-substantive).

N/A – 8; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

N/A – 9; AL6400 – Alternatives: Support Alternative A.

N/A – 10; AL6400 – Alternatives: Support Alternative A.

N/A – 11; AL6400 – Alternatives: Support Alternative A.

N/A – 13; AL2010 – Alternatives: Support ORV Restrictions (Non-substantive). AL5010 – Alternative Elements: Monitoring and Enforcement.

N/A – 15; MT1000 – Miscellaneous Topics: General Comments.

N/A – 17; AL6400 – Alternatives: Support Alternative A. AL7000 – Alternatives: Alternative B.

N/A – 19; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive). AL6400 – Alternatives: Support Alternative A.

N/A – 22; AL5030 – Alternative Elements: Vehicle Requirements.

N/A – 24; AL5055 – Alternative Elements: Zone System.

N/A – 25; AL4000 – Alternatives: New Alternatives or Elements. AL6400 – Alternatives: Support Alternative A.

N/A – 28; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 30; PN3000 – Purpose and Need: Scope of the Analysis.

N/A – 32; AE1022 – Affected Environment: T&E and Species of Concern (Non-substantive). AL6400 – Alternatives: Support Alternative A.

N/A – 33; AL6400 – Alternatives: Support Alternative A. MT1000 – Miscellaneous Topics: General Comments.

N/A – 34; AE1022 – Affected Environment: T&E and Species of Concern (Non-substantive). AL7600 – Alternatives: Oppose Alternative B.

N/A – 35; AL6400 – Alternatives: Support Alternative A.

N/A – 36; AL6400 – Alternatives: Support Alternative A.

N/A – 37; AL6400 – Alternatives: Support Alternative A.

N/A – 38; AL4000 – Alternatives: New Alternatives or Elements. AL5020 – Alternative Elements: Camping, Campfires, and Other Amenities. AL5056 – Alternative Elements: Zone System (Non-substantive).

N/A – 39; AL9000 – Alternatives: Alternative D.

N/A – 40; AL6400 – Alternatives: Support Alternative A.

N/A – 41; AL6400 – Alternatives: Support Alternative A.

N/A – 42; AL5046 – Alternative Elements: Permit Requirements (Non-substantive). AL5056 – Alternative Elements: Zone System (Non-substantive). AL6400 – Alternatives: Support Alternative A.

N/A – 43; AL5055 – Alternative Elements: Zone System. AL6400 – Alternatives: Support Alternative A.

N/A – 46; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 47; AE2000 – Affected Environment: Soils. AL6400 – Alternatives: Support Alternative A. TE4000 – Threatened and Endangered Species: Impact of Proposal and Alternatives.

N/A – 48; AL6400 – Alternatives: Support Alternative A.

N/A – 49; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

N/A – 51; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 52; AE10065 – Affected Environment: Issues Considered but Dismissed (Non-substantive). AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 54; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive). AL2011 – Alternatives: Oppose ORV Restrictions (Non-substantive).

N/A – 56; AL2000 – Alternatives: Support ORV Access (Non-substantive). AL5046 – Alternative Elements: Permit Requirements (Non-substantive).

N/A – 57; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 58; AL4000 – Alternatives: New Alternatives or Elements.

N/A – 59; AL4005 – Alternatives: New Alternatives or Elements (Non-substantive). AL5056 – Alternative Elements: Zone System (Non-substantive).

N/A – 61; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 62; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

N/A – 63; AL6400 – Alternatives: Support Alternative A.

N/A – 66; AL6400 – Alternatives: Support Alternative A.

N/A – 67; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 68; AL4000 – Alternatives: New Alternatives or Elements. AL5015 – Alternative Elements: Monitoring and Enforcement (Non-substantive). AL6400 – Alternatives: Support Alternative A.

N/A – 71; AL6400 – Alternatives: Support Alternative A.

N/A – 72; AE10060 – Affected Environment: Issues Considered but Dismissed. AE1030 – Affected Environment: Visitor Use and Experience / Health and Safety. AE1050 – Affected Environment: Management and Operations. AL4000 – Alternatives: New Alternatives or Elements. AL5010 – Alternative Elements: Monitoring and Enforcement. AL5035 – Alternative Elements: Equipment Requirements. AL5045 – Alternative Elements: Permit Requirements. AL5050 – Alternative Elements: Designated Vehicle Routes/Areas. AL5055 – Alternative Elements: Zone System. AL5065 – Alternative Elements: Education and Outreach. AL6000 – Alternatives: Alternative A. MO4000 – Management and Operations: Impact of Proposal and Alternatives.

N/A – 74; AL5020 – Alternative Elements: Camping, Campfires, and Other Amenities. AL5036 – Alternative Elements: Equipment Requirements (Non-substantive). AL5040 – Alternative Elements: Speed Limits. AL5045 – Alternative Elements: Permit Requirements. AL5050 – Alternative Elements: Designated Vehicle Routes/Areas. AL7000 – Alternatives: Alternative B.

N/A – 76; AL6400 – Alternatives: Support Alternative A.

N/A – 78; AL6400 – Alternatives: Support Alternative A.

N/A – 80; AL5020 – Alternative Elements: Camping, Campfires, and Other Amenities.

N/A – 82; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 83; AL6400 – Alternatives: Support Alternative A.

N/A – 86; AL6400 – Alternatives: Support Alternative A.

N/A – 87; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 88; AL6400 – Alternatives: Support Alternative A.

N/A – 89; AL6400 – Alternatives: Support Alternative A.

N/A – 92; AL2000 – Alternatives: Support ORV Access (Non-substantive).

N/A – 94; AL6400 – Alternatives: Support Alternative A.

N/A – 99; AL5046 – Alternative Elements: Permit Requirements (Non-substantive).

N/A – 100; AL6400 – Alternatives: Support Alternative A.

N/A – 101; AL6400 – Alternatives: Support Alternative A.

N/A – 102; AL9000 – Alternatives: Alternative D.

N/A – 103; AL4000 – Alternatives: New Alternatives or Elements. AL5066 – Alternative Elements: Education and Outreach (Non-substantive). AL9400 – Alternatives: Support Alternative D.

N/A – 104; AL4000 – Alternatives: New Alternatives or Elements.

N/A – 105; AL6400 – Alternatives: Support Alternative A.

N/A – 106; AE10060 – Affected Environment: Issues Considered but Dismissed. AE1010 – Affected Environment: Soundscapes and Acoustic Environment. AL4000 – Alternatives: New Alternatives or Elements.

N/A – 107; AL6400 – Alternatives: Support Alternative A.

N/A – 108; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive). AL6400 – Alternatives: Support Alternative A.

N/A – 109; AL6400 – Alternatives: Support Alternative A.

N/A – 110; AL4000 – Alternatives: New Alternatives or Elements. AL6400 – Alternatives: Support Alternative A.

N/A – 111; AL6400 – Alternatives: Support Alternative A.

N/A – 112; AL6400 – Alternatives: Support Alternative A.

N/A – 114; AE2000 – Affected Environment: Soils.

N/A – 115; AL6400 – Alternatives: Support Alternative A.

none – 73; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

PEA – 18; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

PEA – 79; AL5055 – Alternative Elements: Zone System.

Post Enduro Association, AFD retired – 23; AE2000 – Affected Environment: Soils.

Riders – 70; AE1035 – Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive).

self – 3; AL6400 – Alternatives: Support Alternative A.

Texas Off-Roaders – 31; AE2005 – Affected Environment: Soils (Non-substantive).

Texasoffroaders – 20; AL6400 – Alternatives: Support Alternative A. CC1000 – Consultation and Coordination: General Comments. PN4000 – Purpose and Need: Park Legislation/Authority.

Texas off roaders asso. – 96; AL6400 – Alternatives: Support Alternative A.

Texas Off Roaders Assoc. – 16; AL2000 – Alternatives: Support ORV Access (Non-substantive).

Texas Off Roaders Association – 29; AL5045 – Alternative Elements: Permit Requirements. AL6400 – Alternatives: Support Alternative A. AL9400 – Alternatives: Support Alternative D.

Tora – 45; AL2000 – Alternatives: Support ORV Access (Non-substantive).

Tora – 77; AL6400 – Alternatives: Support Alternative A.

TORA – 65; AL6200 – Alternatives: Alternative A (Non-substantive). AL6400 – Alternatives: Support Alternative A.

TRH – 12; AL6400 – Alternatives: Support Alternative A.

Track & Trail Sports Riders – 91; AL9000 – Alternatives: Alternative D.

Track and Trail, AMA – 64; AL6400 – Alternatives: Support Alternative A.

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American Motorcyclist Association – 6
N/A – 4, 54

AL4000 – Alternatives: New Alternatives or Elements

Local resident – 95
N/A – 1, 25, 38, 58, 68, 72, 103, 104, 106, 110
West Texas Outlaws Off Road Club – 81

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N/A – 59

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N/A – 1, 13, 72

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Texas Off Roaders Association – 29

AL5046 – Alternative Elements: Permit Requirements (Non-substantive)

Amarillo Off Road Association – 44
N/A – 1, 42, 56, 99

AL5050 – Alternative Elements: Designated Vehicle Routes/Areas

N/A – 72, 74

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American Motorcyclist Association – 6
N/A – 24, 43, 72
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AL5056 – Alternative Elements: Zone System (Non-substantive)

avid off-roader with kids! – 14
N/A – 38, 42, 59

AL5065 – Alternative Elements: Education and Outreach

N/A – 1, 72

AL5066 – Alternative Elements: Education and Outreach (Non-substantive)

N/A – 103

AL6000 – Alternatives: Alternative A

N/A – 72

AL6200 – Alternatives: Alternative A (Non-substantive)

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AL7000 – Alternatives: Alternative B

N/A – 17, 74
US Environmental Protection Agency – Region 6 – 116

AL7400 – Alternatives: Support Alternative B

West Texas Outlaws Off Road Club – 81

AL7600 – Alternatives: Oppose Alternative B

Mass Carnage Offroad – 50
N/A – 34

AL8000 – Alternatives: Alternative C

US Environmental Protection Agency – Region 6 – 116

AL8600 – Alternatives: Oppose Alternative C

Mass Carnage Offroad – 50

AL9000 – Alternatives: Alternative D

American Motorcyclist Association – 6
N/A – 39, 102
Track & Trail Sports Riders – 91

AL9400 – Alternatives: Support Alternative D

N/A – 103
Texas Off Roaders Association – 29

AL9600 – Alternatives: Oppose Alternative D

Mass Carnage Offroad – 50

AR4000 – Archeology Resources: Impact of Proposal and Alternatives

State Historic Preservation Officer – 113

CC1000 – Consultation and Coordination: General Comments

Texasoffroaders – 20
US Environmental Protection Agency – Region 6 – 116

GA1000 – Impact Analysis: Impact Analyses

West Texas Outlaws Off Road Club – 81

MO4000 – Management and Operations: Impact of Proposal and Alternatives

N/A – 72

MT1000 – Miscellaneous Topics: General Comments

N/A – 15, 33

PN3000 – Purpose and Need: Scope of the Analysis

N/A – 30

PN4000 – Purpose and Need: Park Legislation/Authority

Texasoffroaders – 20

TE4000 – Threatened and Endangered Species: Impact of Proposal and Alternatives

N/A – 47

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Mud inc – 93
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NON-SUBSTANTIVE COMMENT REPORT

LAKE MEREDITH NATIONAL RECREATION AREA
DRAFT OFF-ROAD VEHICLE MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT

AE10065 Affected Environment: Issues Considered but Dismissed (Non-substantive)

Correspondence Id: 52 **Comment Id:** 312899 **Coder Name:** LORI_FOX

Comment Text: Leave the river and Rosita flats alone. I speak for thousands when I say that's are back yard. Several off road organizations are working more everyday to keep it clean. Please do not change anything. I believe it will effect Amarillo's economy.

Organization:

Commenter: Aaron M Brown **Page: Paragraph:**

Kept Private: No

AE1022 Affected Environment: T&E and Species of Concern (Non-substantive)

Correspondence Id: 32 **Comment Id:** 312858 **Coder Name:** LORI_FOX

Comment Text: I also have heard that an endangered fish lives in the river. All I have to say about that is physically go get out into the river and see if the water gets past your shins. I wouldn't think that would be enough water for anything to survive in.

Organization:

Commenter: Dustin G Cates **Page: Paragraph:**

Kept Private: No

Correspondence Id: 34 **Comment Id:** 312863 **Coder Name:** LORI_FOX

Comment Text: Alternative B will restrict riding so much that it simply will not be worth bothering with. Texas has so little, if any, public riding areas as it is. I do not believe that the any of the legal riding activities at the Canadian river has caused a danger to the "endangered" silver minnow--it is simply the lack of water. Reducing ORV use will not save the fish.

Organization:

Commenter: Mark E Darnell **Page: Paragraph:**

Kept Private: No

AE1035 Affected Environment: Visitor Use and Experience / Health and Safety (Non-substantive)

Correspondence Id: 8 **Comment Id:** 310241 **Coder Name:** LORI_FOX

Comment Text: My wife and kids drive 4 hrs away to go ride the sand dunes of waynoka. We do this 4 times a year because they know what it is all about. money and helping the little towns out.Whoever is over the lake Needs to see what Waynoka Oklahoma doing.They charger to ride the dunes 10.00 per rider 30.00 a night camping.Call and ask them how much they make during snake hunt weekend.

Organization:

Commenter: doyle yake **Page: Paragraph:**

Kept Private: No

Correspondence Id: 108 **Comment Id:** 315667 **Coder Name:** LORI_FOX

Comment Text: My friends and family and I have been going to "the river" for as long as I can remember. The place holds many of my good memories. It is a place where we can go get away from society for a little while to find some peace and relaxation.

Organization:

Commenter: Caleb McGuire **Page: Paragraph:**

Kept Private: No

Correspondence Id: 84 **Comment Id:** 313139 **Coder Name:** LORI_FOX

Comment Text: This will ruin a good family tradition that is many decades long. Please consider that.

Organization: Mx

Commenter: Roger A Magley **Page: Paragraph:**

Kept Private: No

Correspondence Id: 73 **Comment Id:** 313079 **Coder Name:** LORI_FOX

Comment Text: My family has used the trails at the Canadian River Bridge for many years for recreational purposes that include camping, picnics, riding motorcycles, watching sand drags, four wheeling and teaching the children to drive in a safe environment. It would be ridiculous to shut this area down.

Organization: none

Commenter: Sandra Black **Page: Paragraph:**

Kept Private: No

Correspondence Id: 54 **Comment Id:** 312944 **Coder Name:** LORI_FOX

Comment Text: Texas is the only State in the U.S. that has a natural river open to the public for off roading. That should say enough as it is. People from other States come to Amarillo just for the Canadian river to off road. They bring in revenue for hotels, sporting good stores, restraints and fuel stations just for the chance to off road free. Off roading is a large part of the Texas image as well.

Organization:

Commenter: N/A N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 70 **Comment Id:** 312938 **Coder Name:** LORI_FOX

Comment Text: I love the river don’t change a thing its perfect the way it is

Organization: Riders

Commenter: Thomas Paddack **Page: Paragraph:**

Kept Private: No

Correspondence Id: 62 **Comment Id:** 312922 **Coder Name:** LORI_FOX

Comment Text: when you are out there it feels like you are part of a huge family…where else can you find that???

Organization:

Commenter: N/A N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 49 **Comment Id:** 312895 **Coder Name:** LORI_FOX

Comment Text: There are not many public places in Texas for ORV use and the private ones are few and far in between. I encourage you to keep the areas up for consideration as useable as possible for everyone. Please don't punish us who do respect and take care of the area because of a few who do not care what they tear up or trash.

Organization:

Commenter: N/A N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 19 **Comment Id:** 312604 **Coder Name:** LORI_FOX

Comment Text: I was taught by my father how to ride dirt bikes at the Canadian river area in 1967. I enjoyed the river from that point on and continue to do so. I have taught my kids how to ride there also, and soon will be teaching my grandson the same as the rest of the family has learned. We have camped, rode bicycles, rode three wheelers, rode four wheelers and even had a buggy for a while. We have watched the river take many changes, I remember the flood and remember thinking we had lost the river, it did change things. I can't imagine not having this place where so many memories have been made, not only for my family, but for many others too.

Organization:

Commenter: Todd Snider **Page: Paragraph:**

Kept Private: No

Correspondence Id: 18 **Comment Id:** 312603 **Coder Name:** LORI_FOX

Comment Text: Rosita flats, the river, means so much to our family. That's where we get away from the stress of life. Please don't take it away.

Organization: PEA

Commenter: Joe G Graham **Page: Paragraph:**

Kept Private: No

AE2005 Affected Environment: Soils (Non-substantive)

Correspondence Id: 31 **Comment Id:** 312856 **Coder Name:** LORI_FOX

Comment Text: The off-roaders have used & enjoyed Rosita Flats since the 40's & all of the sudden "resource preservation" becomes a big deal. Well, You-all closed Honda Hill (on the north side) & the trails up it are clearly visible.

Organization: Texas Off-Roaders

Commenter: frankie d hamilton **Page: Paragraph:**

Kept Private: No

AL1001 Alternatives: Elements Common to All Alternatives (Non-substantive)

Correspondence Id: 1 **Comment Id:** 310278 **Coder Name:** KCHIPMAN

Comment Text: ban glass drinks. drink what you want but not in glass. do not drive drunk either. not atvs/utvs/dune buggies/whatever. the glass is a problem. there are too many folks who throw them down and it cuts tires. besides, kids play in the water and the broken glass could injure them.

Organization:

Commenter: R D Sargent **Page: Paragraph:**

Kept Private: No

AL2000 Alternatives: Support ORV Access (Non-substantive)

Correspondence Id: 2 **Comment Id:** 310245 **Coder Name:** LORI_FOX

Comment Text: It would be good for the people in the area to have some options for off road riding. I'm always going to vote yes on more trails or access to trails.

Organization:

Commenter: roger d Boisjolie **Page: Paragraph:**

Kept Private: No

Correspondence Id: 92 **Comment Id:** 313149 **Coder Name:** LORI_FOX

Comment Text: Writing to keep Rosita flats open. Simple it good family fun.

Organization:

Commenter: Troy White **Page: Paragraph:**

Kept Private: No

Correspondence Id: 87 **Comment Id:** 313144 **Coder Name:** LORI_FOX

Comment Text: I support keeping the Canadian river open for off road enthusiast. It's a place many have enjoyed and should be able to continue to enjoy.

Organization:

Commenter: Stephen T Havins **Page: Paragraph:**

Kept Private: No

Correspondence Id: 82 **Comment Id:** 313137 **Coder Name:** LORI_FOX
Comment Text: Please do not take our public land away just cause of a few bad apples.
Organization:
Commenter: Chris N/A **Page: Paragraph:**
Kept Private: No

Correspondence Id: 67 **Comment Id:** 312933 **Coder Name:** LORI_FOX
Comment Text: Please leave the Canadian River access unchanged. If you restrict access, you will be eliminating countless opportunities for recreation in our area.
Organization:
Commenter: David G Park **Page: Paragraph:**
Kept Private: No

Correspondence Id: 61 **Comment Id:** 312921 **Coder Name:** LORI_FOX
Comment Text: Please don't take this away from us cause of some disrespectful people. It's all we got around here the lake is drying up and were losing everything so please don't take this one thing away.
Organization:
Commenter: Darik S Schilling **Page: Paragraph:**
Kept Private: No

Correspondence Id: 60 **Comment Id:** 312920 **Coder Name:** LORI_FOX
Comment Text: No one should take away that place it's the one place that you can let loose and have fun while still being respectful of your surroundings!
Organization: Mudd Inc
Commenter: Brady M Sayers **Page: Paragraph:**
Kept Private: No

Correspondence Id: 57 **Comment Id:** 312915 **Coder Name:** LORI_FOX
Comment Text: If you take away our river your not just taking away a place to off road…. Your taking another part of home to a lot of people!!
Organization:
Commenter: Danella West **Page: Paragraph:**
Kept Private: No

Correspondence Id: 56 **Comment Id:** 312914 **Coder Name:** LORI_FOX
Comment Text: Keep Rosita Flats and Blue Creek open to our family and friends so we can continue to enjoy the one-of-a-kind experience.
Organization:
Commenter: Jamie N/A **Page: Paragraph:**
Kept Private: No

Correspondence Id: 55 **Comment Id:** 312912 **Coder Name:** LORI_FOX

Comment Text: I would love to do anything I can to help keep the river around!!

Organization: MUDD INC.

Commenter: Chris Helm **Page: Paragraph:**

Kept Private: No

Correspondence Id: 52 **Comment Id:** 312899 **Coder Name:** LORI_FOX

Comment Text: Leave the river and Rosita flats alone. I speak for thousands when I say that's are back yard. Several off road organizations are working more everyday to keep it clean. Please do not change anything. I believe it will effect Amarillo's economy.

Organization:

Commenter: Aaron M Brown **Page: Paragraph:**

Kept Private: No

Correspondence Id: 51 **Comment Id:** 312898 **Coder Name:** LORI_FOX

Comment Text: I feel that the Rosita flats should be kept open to the public to use when they want. Most people that I know that go there always pick up after themselves and others and take care of it. It is really nice to have a place to go play in the mud.

Organization:

Commenter: Deana Patin **Page: Paragraph:**

Kept Private: No

Correspondence Id: 46 **Comment Id:** 312889 **Coder Name:** LORI_FOX

Comment Text: so I guess what I'm asking is for you to leave the river open so that we can all still go and enjoy what we have all known as kids to adults and so that we can give that same opportunity to are children

Organization:

Commenter: Jmaes Guenther **Page: Paragraph:**

Kept Private: No

Correspondence Id: 45 **Comment Id:** 312888 **Coder Name:** LORI_FOX

Comment Text: Keep Rosita flats open to the public!

Organization: Tora

Commenter: Shawna Bohn **Page: Paragraph:**

Kept Private: No

Correspondence Id: 28 **Comment Id:** 312609 **Coder Name:** LORI_FOX

Comment Text: leave the park along and let us ride and have fun

Organization:

Commenter: toby d jewett **Page: Paragraph:**

Kept Private: No

Correspondence Id: 16 **Comment Id:** 312600 **Coder Name:** LORI_FOX

Comment Text: It is very important that this area remains open to recreational enthusiasts as there is no other place that we can go to enjoy the riding.

Organization: Texas Off Roaders Assoc.

Commenter: Daniel M O'Neal **Page: Paragraph:**

Kept Private: No

Correspondence Id: 1 **Comment Id:** 310282 **Coder Name:** KCHIPMAN

Comment Text: i'm glad we have two places here in this area where families can go ride and enjoy the outdoors. i'm glad that LMNRA supports the atv industry, atv hobbies, atv enthusiasts, and hunters alike with these areas.

Organization:

Commenter: R D Sargent **Page: Paragraph:**

Kept Private: No

AL2010 Alternatives: Support ORV Restrictions (Non-substantive)

Correspondence Id: 13 **Comment Id:** 312594 **Coder Name:** LORI_FOX

Comment Text: I think adding fees and requiring permits, giving map of areas where these vehicles may go and highlight areas where they are banned. They have a great amount of impact on wildlife. I think the areas where they are allowed you should give yearly permits so the "outdoorsy" people who ride these things can go have fun tearing up the trails.

Organization:

Commenter: laurie s keick **Page: Paragraph:**

Kept Private: No

AL2011 Alternatives: Oppose ORV Restrictions (Non-substantive)

Correspondence Id: 4 **Comment Id:** 310247 **Coder Name:** LORI_FOX

Comment Text: I am against the further closure of trails historically used for OHV access and fully support the public's right to access public lands, within reason and with safety in mind, for recreational purposes.

Organization:

Commenter: Edwin Quinones **Page: Paragraph:**

Kept Private: No

Correspondence Id: 54 **Comment Id:** 312942 **Coder Name:** LORI_FOX

Comment Text: I'm against closing down Rosita Flats and any other part of the Canadian river for off roading.

Organization:

Commenter: N/A N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 6 **Comment Id:** 310288 **Coder Name:** KCHIPMAN

Comment Text: The DEIS will unfairly limit access to an important recreation area. The preferred alternative will increase the costs associated with OHV use while, at the same time, limiting the areas available for responsible OHV use.

Organization: American Motorcyclist Association

Commenter: Wayne Allard **Page: Paragraph:**

Kept Private: No

Correspondence Id: 6 **Comment Id:** 310284 **Coder Name:** KCHIPMAN

Comment Text: The AMA takes issue with alternatives B, C, and D in the DEIS because they would drastically restrict responsible OHV use in the Lake Meredith National Recreation Area.

Organization: American Motorcyclist Association

Commenter: Wayne Allard **Page: Paragraph:**

Kept Private: No

AL4005 Alternatives: New Alternatives or Elements (Non-substantive)

Correspondence Id: 59 **Comment Id:** 312918 **Coder Name:** LORI_FOX

Comment Text: No glass bottles we support!

Organization:

Commenter: N/A N/A **Page: Paragraph:**

Kept Private: No

AL5015 Alternative Elements: Monitoring and Enforcement (Non-substantive)

Correspondence Id: 68 **Comment Id:** 312936 **Coder Name:** LORI_FOX

Comment Text: If you really and truly want to help the river, become part of the ranger team there. Enforce the rules that are there now.

Organization:

Commenter: Kris L Hubbard **Page: Paragraph:**

Kept Private: No

AL5036 Alternative Elements: Equipment Requirements (Non-substantive)

Correspondence Id: 74 **Comment Id:** 313094 **Coder Name:** LORI_FOX

Comment Text: I agree with the following statements: As described in Chapter 1 Page viii: Operator/Vehicle Requirements-Additional operator/vehicle requirements would be implemented and would include the following: All ORVs would be required to have a functioning muffler system, a qualified spark arrester (ATVs only), and functioning headlights and taillights. If a vehicle does not have functioning headlights or taillights, it would be permitted to operate during the day, but not after dark. All ATVs would be required to have a triangular orange flag on top of an 8-foot pole attached to the back of the vehicle. All ORVs would be required to display lighted headlights and taillights after dark. Waste Disposal-The NPS would continue to provide waste disposal services at Blue Creek and Rosita Flats and would develop new educational programs/materials for clarifying issues such as proper waste disposal techniques.

Organization:

Commenter: Carrie Hoffman **Page: Paragraph:**

Kept Private: No

AL5046 Alternative Elements: Permit Requirements (Non-substantive)

Correspondence Id: 1 **Comment Id:** 310283 **Coder Name:** KCHIPMAN

Comment Text: i would have no problem with paying for a permit to play. privately owned atv parks require this, so i have no problems with NPS requiring this also.

Organization:

Commenter: R D Sargent **Page: Paragraph:**

Kept Private: No

Correspondence Id: 99 **Comment Id:** 313155 **Coder Name:** LORI_FOX

Comment Text: I think Rosita Flats should require an off-road sticker, which it already does.

Organization:

Commenter: Eric N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 56 **Comment Id:** 312913 **Coder Name:** LORI_FOX

Comment Text: We don't have new toys, we have toys that we take care of and maintain because we can't afford the new ones any more than we can afford to pay a bunch of fees for everything from camping to decals.

Organization:

Commenter: Jamie N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 44 **Comment Id:** 312887 **Coder Name:** LORI_FOX

Comment Text: that's what is wrong with our country now, where is all the money going to that we pay each year for our off road permit????

Organization: Amarillo Off Road Association

Commenter: Tracie M West **Page: Paragraph:**

Kept Private: No

Correspondence Id: 42 **Comment Id:** 312885 **Coder Name:** LORI_FOX

Comment Text: I completely support a fee system as long as it gives facilities to the area and keeps the rules enforced, but I do not like a width limit of 5 feet on any trail, nor do I agree that I can't ride in a area during rifle season because I ride year round. Until a option that works for everyone is presented I choose option A (NO ACTION) be taken.

Organization:

Commenter: Dewey E Mincey **Page: Paragraph:**

Kept Private: No

AL5056 Alternative Elements: Zone System (Non-substantive)

Correspondence Id: 14 **Comment Id:** 312597 **Coder Name:** LORI_FOX

Comment Text: I DO NOT support the designation of any areas for any specific use. I DO NOT support additional regulations or restrictions for these areas. I DO NOT support the construction of restrooms, picnic areas or the like in these areas because the inevitable "bad apple" can ruin them in no time at all.

Organization: avid off-roader with kids!

Commenter: James Pringle **Page: Paragraph:**

Kept Private: No

Correspondence Id: 59 **Comment Id:** 312919 **Coder Name:** LORI_FOX

Comment Text: The idea of no access during hunting season is not supported. Weather permitting we usually spend lots of time at the river during this time.

Organization:

Commenter: N/A N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 42 **Comment Id:** 312885 **Coder Name:** LORI_FOX

Comment Text: I completely support a fee system as long as it gives facilities to the area and keeps the rules enforced, but I do not like a width limit of 5 feet on any trail, nor do I agree that I can't ride in a area during rifle season because I ride year round. Until a option that works for everyone is presented I choose option A (NO ACTION) be taken.

Organization:

Commenter: Dewey E Mincey **Page: Paragraph:**

Kept Private: No

Correspondence Id: 38 **Comment Id:** 312875 **Coder Name:** LORI_FOX

Comment Text: We do not want the trails to be split, we want to be able to ride with our family and friends.

Organization:

Commenter: Susan Huff **Page: Paragraph:**

Kept Private: No

AL5066 Alternative Elements: Education and Outreach (Non-substantive)

Correspondence Id: 103 **Comment Id:** 313179 **Coder Name:** LORI_FOX

Comment Text: Education and outreach section of the plan sounds like a great idea. The more you can inform people of the land the more they will respect it and take care of it.

Organization:

Commenter: Harley Lewis **Page: Paragraph:**

Kept Private: No

AL6200 Alternatives: Alternative A (Non-substantive)

Correspondence Id: 65 **Comment Id:** 312928 **Coder Name:** LORI_FOX

Comment Text: Please be advised, in the event any option other than (Option A) is chosen, a formal petition process will be initiated.

Organization: TORA

Commenter: Texas Off-Roaders Association N/A **Page: Paragraph:**

Kept Private: No

AL6400 Alternatives: Support Alternative A (Non-substantive)

Correspondence Id: 7 **Comment Id:** 310242 **Coder Name:** LORI_FOX

Comment Text: Our children and grandchildren find this area a great place to go for safe and fund family outings. We urge you to consider Option A "No action preferred.

Organization: JUST A PRIVATE CITIZEN

Commenter: LAWRENCE G PICKENS **Page: Paragraph:**

Kept Private: No

Correspondence Id: 115 **Comment Id:** 315685 **Coder Name:** LORI_FOX

Comment Text: I would like to support Option A.

Organization:

Commenter: Trevor Kitts **Page: Paragraph:**

Kept Private: No

Correspondence Id: 112 **Comment Id:** 315676 **Coder Name:** LORI_FOX
Comment Text: This area is great as is ? I chose A. All the regulations are unnecessary and intrusive.
Organization:
Commenter: Terri Kitts **Page: Paragraph:**
Kept Private: No

Correspondence Id: 111 **Comment Id:** 315675 **Coder Name:** LORI_FOX
Comment Text: Alternative A! Stay on the other end of the lake!
Organization:
Commenter: Tom Kitts **Page: Paragraph:**
Kept Private: No

Correspondence Id: 110 **Comment Id:** 315672 **Coder Name:** LORI_FOX
Comment Text: Please leave things just as they are (Plan A?).
Organization:
Commenter: Arthur G Forter **Page: Paragraph:**
Kept Private: No

Correspondence Id: 109 **Comment Id:** 315669 **Coder Name:** LORI_FOX
Comment Text: I support option "A".
Organization:
Commenter: Caleb McGuire **Page: Paragraph:**
Kept Private: No

Correspondence Id: 108 **Comment Id:** 315666 **Coder Name:** LORI_FOX
Comment Text: I support option "A".
Organization:
Commenter: Caleb McGuire **Page: Paragraph:**
Kept Private: No

Correspondence Id: 107 **Comment Id:** 315303 **Coder Name:** LORI_FOX
Comment Text: There is No Need for Action! Alternative "A" as is.
Organization:
Commenter: J Coker **Page: Paragraph:**
Kept Private: No

Correspondence Id: 105 **Comment Id:** 313183 **Coder Name:** LORI_FOX
Comment Text: – There was little done about the recreational value of Lake Meredith before it was drained. Please don't let the river suffer the same fate. Alt A. – Leave things the way they are! Alt A. Leave it alone!!!
Organization:

Commenter: N/A **Page: Paragraph:**
Kept Private: No

Correspondence Id: 100 **Comment Id:** 313156 **Coder Name:** LORI_FOX
Comment Text: Plan A at the least. Save some money lord knows the Fed needs that.
Organization:
Commenter: N/A **Page: Paragraph:**
Kept Private: No

Correspondence Id: 96 **Comment Id:** 313153 **Coder Name:** LORI_FOX
Comment Text: Option A is what I want… NO CHANGE
Organization: Texas off roaders asso.
Commenter: Tim Young **Page: Paragraph:**
Kept Private: No

Correspondence Id: 94 **Comment Id:** 313151 **Coder Name:** LORI_FOX
Comment Text: I have been using and riding the lake Meredith and Canadian river riding area for close to 15 years now and plan on the continuation of being able to use it so I'm imputing Alternative A or No Action.
Organization:
Commenter: Shannon Pulliam **Page: Paragraph:**
Kept Private: No

Correspondence Id: 90 **Comment Id:** 313147 **Coder Name:** LORI_FOX
Comment Text: As a responsible off road vehicle user, I adamantly support Alternative A or No Action.
Organization: AMA
Commenter: Michelle Hill **Page: Paragraph:**
Kept Private: No

Correspondence Id: 89 **Comment Id:** 313146 **Coder Name:** LORI_FOX
Comment Text: We have reviewed the options; please consider option A so we can continue our family outings utilization of public lands.
Organization:
Commenter: Kaylyn M Drake **Page: Paragraph:**
Kept Private: No

Correspondence Id: 88 **Comment Id:** 313145 **Coder Name:** LORI_FOX
Comment Text: i chose alternative "A" or no action.
Organization:
Commenter: stirling r beck **Page: Paragraph:**
Kept Private: No

Correspondence Id: 86 **Comment Id:** 313143 **Coder Name:** LORI_FOX
Comment Text: The most logical proposal is Alternative A or "No Action".
Organization:
Commenter: N/A **Page: Paragraph:**
Kept Private: No

Correspondence Id: 85 **Comment Id:** 313142 **Coder Name:** LORI_FOX
Comment Text: I fervidly endorse Alt. A or No Action.
Organization: AMA
Commenter: Matt Wright **Page: Paragraph:**
Kept Private: No

Correspondence Id: 83 **Comment Id:** 313138 **Coder Name:** LORI_FOX
Comment Text: I have read the 2010 EIS for lake merideth recreation area and I implore you to take alternative action A or "no action".
Organization:
Commenter: Frank Blankenship **Page: Paragraph:**
Kept Private: No

Correspondence Id: 78 **Comment Id:** 313118 **Coder Name:** LORI_FOX
Comment Text: OPTION A NO ACTION IS WHAT I CHOOSE
Organization:
Commenter: Lendon L Hill **Page: Paragraph:**
Kept Private: No

Correspondence Id: 77 **Comment Id:** 313116 **Coder Name:** LORI_FOX
Comment Text: As a responsible an avid user of the Canadian river and Rosita flats area it troubles me to think this recreational areas could become more restricted to motorcycles and atv use in any way please take notice that though I disagree with any changes and would like option a or no action at all be taken
Organization: Tora
Commenter: Justin Johnson **Page: Paragraph:**
Kept Private: No

Correspondence Id: 76 **Comment Id:** 313115 **Coder Name:** LORI_FOX
Comment Text: Option A, please!
Organization:
Commenter: N/A **Page: Paragraph:**
Kept Private: No

Correspondence Id: 75 **Comment Id:** 313114 **Coder Name:** LORI_FOX

Comment Text: Plan A is clearly the best choice.
Organization: motor cycle riders
Commenter: Douglas Black **Page: Paragraph:**
Kept Private: No

Correspondence Id: 101 **Comment Id:** 313077 **Coder Name:** LORI_FOX
Comment Text: I SUPPORT PLAN A
Organization:
Commenter: randy l black **Page: Paragraph:**
Kept Private: No

Correspondence Id: 71 **Comment Id:** 312939 **Coder Name:** LORI_FOX
Comment Text: I think that Alternative A is the best option, and the only feasible one at that.
Organization:
Commenter: David T Sparks **Page: Paragraph:**
Kept Private: No

Correspondence Id: 69 **Comment Id:** 312937 **Coder Name:** LORI_FOX
Comment Text: I choose option A…My group respects these lands & would love to be able to share it with our children & children's children…
Organization: High Plains Offroad
Commenter: Blaine Bolton **Page: Paragraph:**
Kept Private: No

Correspondence Id: 68 **Comment Id:** 312934 **Coder Name:** LORI_FOX
Comment Text: I'm voting for plan A.
Organization:
Commenter: Kris L Hubbard **Page: Paragraph:**
Kept Private: No

Correspondence Id: 66 **Comment Id:** 312932 **Coder Name:** LORI_FOX
Comment Text: That's why I choose Alternative A!!! "NO ACTION"
Organization:
Commenter: N/A Wilkins **Page: Paragraph:**
Kept Private: No

Correspondence Id: 65 **Comment Id:** 312927 **Coder Name:** LORI_FOX
Comment Text: Texas Off-Roader's Association (TORA) official position for the National Park Service (NPS) planning proposal is Plan A (NO ACTION.)
Organization: TORA
Commenter: Texas Off-Roaders Association N/A **Page: Paragraph:**

Kept Private: No

Correspondence Id: 64 **Comment Id:** 312926 **Coder Name:** LORI_FOX
Comment Text: The best option for anyone with the same concerns as mine is option A. No. Action.
Organization: Track and Trail, AMA
Commenter: Beau R Gabert **Page: Paragraph:**
Kept Private: No

Correspondence Id: 63 **Comment Id:** 312925 **Coder Name:** LORI_FOX
Comment Text: It would be a shame to lose the unrestricted use of The Rosita Flats area that has been an offroad Meca for families to enjoy for so many years. This is the reason that i feel that option "A" (NO ACTION) is the logical choice.
Organization:
Commenter: Mike W Buescher **Page: Paragraph:**
Kept Private: No

Correspondence Id: 50 **Comment Id:** 312896 **Coder Name:** LORI_FOX
Comment Text: official position for the National Park Service (NPS) planning proposal is Plan A (NO ACTION.)
Organization: Mass Carnage Offroad
Commenter: Shane Broaddus **Page: Paragraph:**
Kept Private: No

Correspondence Id: 48 **Comment Id:** 312894 **Coder Name:** LORI_FOX
Comment Text: I encourage those entrusted with this decision to vote "no action".
Organization:
Commenter: Leah M McNatt **Page: Paragraph:**
Kept Private: No

Correspondence Id: 47 **Comment Id:** 312890 **Coder Name:** LORI_FOX
Comment Text: I would like to suggest that at this time you please consider the "No action" plan for the Rosita Flats area in the Texas Panhandle.
Organization:
Commenter: Steve R Sell **Page: Paragraph:**
Kept Private: No

Correspondence Id: 43 **Comment Id:** 312886 **Coder Name:** LORI_FOX
Comment Text: However, it is impossible to keep everyone happy so if I had to choose plan A or B, I would choose "A"
Organization:
Commenter: Steven K Bandy **Page: Paragraph:**
Kept Private: No

Correspondence Id: 42 **Comment Id:** 312885 **Coder Name:** LORI_FOX

Comment Text: I completely support a fee system as long as it gives facilities to the area and keeps the rules enforced, but I do not like a width limit of 5 feet on any trail, nor do I agree that I can't ride in a area during rifle season because I ride year round. Until a option that works for everyone is presented I choose option A (NO ACTION) be taken.

Organization:

Commenter: Dewey E Mincey **Page: Paragraph:**

Kept Private: No

Correspondence Id: 41 **Comment Id:** 312884 **Coder Name:** LORI_FOX

Comment Text: As a responsible and avid OHV user at the Canadian River in North Texas I believe the area should remain AS IS. Therefore "NO ACTION" should be taken.

Organization:

Commenter: Shane Hulen **Page: Paragraph:**

Kept Private: No

Correspondence Id: 40 **Comment Id:** 312883 **Coder Name:** LORI_FOX

Comment Text: As a responsible and avid OHV user at the Canadian River in North Texas I believe the area should remain AS IS. Therefore "NO ACTION" should be taken.

Organization:

Commenter: Shane Hulen **Page: Paragraph:**

Kept Private: No

Correspondence Id: 37 **Comment Id:** 312870 **Coder Name:** LORI_FOX

Comment Text: The most logical proposal is Alternative A or "No Action".

Organization:

Commenter: Dawson K Hodges **Page: Paragraph:**

Kept Private: No

Correspondence Id: 36 **Comment Id:** 312869 **Coder Name:** LORI_FOX

Comment Text: The most logical proposal is Alternative A or "No Action".

Organization:

Commenter: Randy K Hodges **Page: Paragraph:**

Kept Private: No

Correspondence Id: 35 **Comment Id:** 312866 **Coder Name:** LORI_FOX

Comment Text: In reviewing the January 2010 EIS for the Lake Meredith National recreational area, I see only one option that will continue to offer the benefits aforementioned. Alternative "A", or no action.

Organization:

Commenter: Allen Sechrist **Page: Paragraph:**

Kept Private: No

Correspondence Id: 33 **Comment Id:** 312860 **Coder Name:** LORI_FOX
Comment Text: Please choose plan A, no action
Organization:
Commenter: Rusty G Cates **Page: Paragraph:**
Kept Private: No

Correspondence Id: 32 **Comment Id:** 312857 **Coder Name:** LORI_FOX
Comment Text: Please choose plan A, no action.
Organization:
Commenter: Dustin G Cates **Page: Paragraph:**
Kept Private: No

Correspondence Id: 29 **Comment Id:** 312854 **Coder Name:** LORI_FOX
Comment Text: I have read the Management Plan in detail and at this time I would submit for strong consideration of Alternative A: No Action ? Continuation of Current Management. My second choice for consideration would be Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas.
Organization: Texas Off Roaders Association
Commenter: Jack D Hall **Page: Paragraph:**
Kept Private: No

Correspondence Id: 25 **Comment Id:** 312613 **Coder Name:** LORI_FOX
Comment Text: I submit my comments in support of option A regarding the proposed changes to the Lake Meredith off road vehicle management plan.
Organization:
Commenter: George P Rasco **Page: Paragraph:**
Kept Private: No

Correspondence Id: 20 **Comment Id:** 312606 **Coder Name:** LORI_FOX
Comment Text: Concerning the proposed alternatives that the NPS has given the "stakeholders" in the Amarillo area I must vote for A, No Action.
Organization: Texasoffroaders
Commenter: Mark Self **Page: Paragraph:**
Kept Private: No

Correspondence Id: 19 **Comment Id:** 312605 **Coder Name:** LORI_FOX
Comment Text: I am asking that you choose Alt A at this time.
Organization:
Commenter: Todd Snider **Page: Paragraph:**
Kept Private: No

Correspondence Id: 17 **Comment Id:** 312601 **Coder Name:** LORI_FOX
Comment Text: The most logical proposal is Alternative A or "No Action".
Organization:
Commenter: Danny South **Page: Paragraph:**
Kept Private: No

Correspondence Id: 14 **Comment Id:** 312598 **Coder Name:** LORI_FOX
Comment Text: I DO support the option of making no changes and leaving these area as they are.
Organization: avid off-roader with kids!
Commenter: James Pringle **Page: Paragraph:**
Kept Private: No

Correspondence Id: 12 **Comment Id:** 312593 **Coder Name:** LORI_FOX
Comment Text: I would suggest Option A.
Organization: TRH
Commenter: robert c granger **Page: Paragraph:**
Kept Private: No

Correspondence Id: 11 **Comment Id:** 312592 **Coder Name:** LORI_FOX
Comment Text: i would like to put my vote in for option A…no change.. i have ridden motorcycles at the river my entire adult life... i have taught my kids to ride there also.. i feel it is our only avenue for this type of riding anywhere close to Amarillo.
Organization:
Commenter: jay hendricks **Page: Paragraph:**
Kept Private: No

Correspondence Id: 10 **Comment Id:** 312591 **Coder Name:** LORI_FOX
Comment Text: OPTION A PLEASE!! NO ACTION PREFERRED!!!
Organization:
Commenter: Nancy T Kuker **Page: Paragraph:**
Kept Private: No

Correspondence Id: 9 **Comment Id:** 310645 **Coder Name:** LORI_FOX
Comment Text: Please pursue the "Option A, No Action Preferred" and save our last family recreation area for generations to come.
Organization:
Commenter: craig phipps **Page: Paragraph:**
Kept Private: No

Correspondence Id: 3 **Comment Id:** 310246 **Coder Name:** LORI_FOX
Comment Text: I endorse the AMA draft response to proposed future restriction of OR vehicles in said Area, and hope it will remain open for my future enjoyment of this great recreation resource.

Organization: self

Commenter: Arthur B Robertson III **Page: Paragraph:**

Kept Private: No

AL7400 Alternatives: Support Alternative B (Non-substantive)

Correspondence Id: 81 **Comment Id:** 313125 **Coder Name:** LORI_FOX

Comment Text: I would prefer the option "A" but was told at the scoping in Fritch that "A" could not be an option so I choose "B" but under protest.

Organization: West Texas Outlaws Off Road Club

Commenter: Jennifer h Johnson **Page: Paragraph:**

Kept Private: No

AL7600 Alternatives: Oppose Alternative B (Non-substantive)

Correspondence Id: 34 **Comment Id:** 312863 **Coder Name:** LORI_FOX

Comment Text: Alternative B will restrict riding so much that it simply will not be worth bothering with. Texas has so little, if any, public riding areas as it is. I do not believe that the any of the legal riding activities at the Canadian river has caused a danger to the "endangered" silver minnow--it is simply the lack of water. Reducing ORV use will not save the fish.

Organization:

Commenter: Mark E Darnell **Page: Paragraph:**

Kept Private: No

Correspondence Id: 50 **Comment Id:** 312897 **Coder Name:** LORI_FOX

Comment Text: I feel plan B, C and D are not options that will provide consistent and OHV user friendly options for the Texas Panhandle off-roaders. Again, any option other than (OPTION A) will unnecessarily restrict access and will infringe on the rights of the users of LAKE MEREDITH NATIONAL PARK RECREATIONAL AREA.

Organization: Mass Carnage Offroad

Commenter: Shane Broaddus **Page: Paragraph:**

Kept Private: No

AL8600 Alternatives: Oppose Alternative C (Non-substantive)

Correspondence Id: 50 **Comment Id:** 312897 **Coder Name:** LORI_FOX

Comment Text: I feel plan B, C and D are not options that will provide consistent and OHV user friendly options for the Texas Panhandle off-roaders. Again, any option other than (OPTION A) will unnecessarily restrict access and will infringe on the rights of the users of LAKE MEREDITH NATIONAL PARK RECREATIONAL AREA.

Organization: Mass Carnage Offroad

Commenter: Shane Broaddus **Page: Paragraph:**

Kept Private: No

AL9400 Alternatives: Support Alternative D (Non-substantive)

Correspondence Id: 29 **Comment Id:** 312854 **Coder Name:** LORI_FOX

Comment Text: I have read the Management Plan in detail and at this time I would submit for strong consideration of Alternative A: No Action ? Continuation of Current Management. My second choice for consideration would be Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas.

Organization: Texas Off Roaders Association

Commenter: Jack D Hall **Page: Paragraph:**

Kept Private: No

Correspondence Id: 103 **Comment Id:** 313180 **Coder Name:** LORI_FOX

Comment Text: The alternative D sounds like it does the most for the state and the ORV operator.

Organization:

Commenter: Harley Lewis **Page: Paragraph:**

Kept Private: No

AL9600 Alternatives: Oppose Alternative D (Non-substantive)

Correspondence Id: 50 **Comment Id:** 312897 **Coder Name:** LORI_FOX

Comment Text: I feel plan B, C and D are not options that will provide consistent and OHV user friendly options for the Texas Panhandle off-roaders. Again, any option other than (OPTION A) will unnecessarily restrict access and will infringe on the rights of the users of LAKE MEREDITH NATIONAL PARK RECREATIONAL AREA.

Organization: Mass Carnage Offroad

Commenter: Shane Broaddus **Page: Paragraph:**

Kept Private: No

MT1000 Miscellaneous Topics: General Comments (Non-substantive)

Correspondence Id: 15 **Comment Id:** 312599 **Coder Name:** LORI_FOX

Comment Text: Find it sad that our government keeps taking away land from the tax payers, to all current government officials you will not get my vote for reelection

Organization:

Commenter: Scott A Smith **Page: Paragraph:**

Kept Private: No

Correspondence Id: 33 **Comment Id:** 312861 **Coder Name:** LORI_FOX

Comment Text: I understand that mountain bike trails are wanting to be put in. Have you ever tried to ride a bicycle in sand? It is not an easy feat. Obviously Palo Duro Canyon is closer to Amarillo, already has trails, and is the best place to ride mountain bikes by far. Spend the money, man hours, and resources elsewhere where it is actually needed.

Organization:

Commenter: Rusty G Cates **Page: Paragraph:**

Kept Private: No

VU4005 Visitor Use and Experience / Health and Safety: Impact of Proposal and Alternatives (Non-substantive)

Correspondence Id: 53 **Comment Id:** 312900 **Coder Name:** LORI_FOX

Comment Text: Taking this recreation away or limiting it from our family's and our youth that learn so much from it is a big mistake. Please understand that it is a much needed area for the future of our kids learning to hunt, camp and respect outdoors and wildlife.

Organization: MUDD INC.

Commenter: Jeremy Helm **Page: Paragraph:**

Kept Private: No

Correspondence Id: 93 **Comment Id:** 313150 **Coder Name:** LORI_FOX

Comment Text: I thank by closing down the river or changing up going to the river more crimes well be taking place and me and my 6 kids want have anything to do together they love going.

Organization: Mud inc

Commenter: Jerry D Green **Page: Paragraph:**

Kept Private: No

ATTACHMENT 1: GOVERNMENT AGENCY AND ORGANIZATION LETTERS RECEIVED DURING CONSULTATION AND THE PUBLIC COMMENT PERIOD

TEXAS HISTORICAL COMMISSION
real places telling real stories

March 6, 2013

Acting Superintendent
Darren Bryant
National Park Service
Lake Meredith National Recreation Area
P.O. Box 1460
Fritch, Texas 79036

Re: Project review under the National Historic Preservation Act: Off Road Vehicle Management Plan and Draft Environmental Impact Statement (NPS: Track #201304593)

Dear Acting Superintendent:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Tiffany Osburn, has completed its review. We appreciate the opportunity to review and comment on the above reference management plan. The document is incorrect in stating that none of the recorded sites within the boundaries of the Lake Meredith National Recreation Area are listed in or considered eligible for listing in the National Register. Our records indicate that many sites within the national recreation area have been determined eligible and the vast majority have undetermined eligibility.

Of the 20 or more previously recorded sites within the portion of the Lake Meredith NRA immediately surrounding the Rosita Flats ORV use area, most have undetermined eligibility and at least one has been determined eligible. Several of these sites actually fall within the highlighted Rosita Flats ORV use area. While no sites have been recorded within the sandy bottom area of the Blue Creek ORV, many sites are adjacent to the creek within the Lake Meredith NRA boundary. Most of these have not been evaluated for NRHP eligibility.

Sites that have undetermined eligibility status should be treated as though they are eligible or avoided entirely until eligibility can be determined. We have concerns that the proposed plan will adversely affect these cultural resources. It is also likely that unrecorded cultural resources are located in these areas and we would recommend a survey to determine the presence of additional cultural resources and assessment of new and previously recorded cultural resources.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Tiffany Osburn at 512/463-8883.**

Sincerely,

for
Mark Wolfe, State Historic Preservation Officer

MW/to

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

March 25, 2013

Cindy Ott-Jones, Superintendent
Lake Meredith National Recreation Area,
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch, Texas 79036

In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Environmental Impact Statement (DEIS)/Off-Road Vehicle (ORV) Management Plan prepared by the National Park Service (NPS). The purpose of the proposed action is to manage ORV use in the national recreation area for visitor enjoyment and recreation opportunities; while minimizing and correcting damage to resources.

EPA rates the DEIS as "EC-2" i.e., EPA has "environmental concerns and requests additional information" in the Final EIS. The EPA's Rating System Criteria can be found here: http://www.epa.gov/oecaerth/nepa/comments/ratings.html. The "EC" rating is based on the potential for adverse impacts to threatened and endangered species, and minority or low-income populations. The "2" indicates the DEIS does not contain sufficient information to fully assess the impact of the action alternatives, tribal impacts, environmental justice concerns, and impacts to threatened and endangered species. Detailed comments are enclosed with this letter which clearly identifies our concerns and the informational needs requested for incorporation into the Final EIS (FEIS). Responses to comments should be placed in a dedicated section of the FEIS and should include the specific location where the revision, if any, was made. If no revision was made, a clear explanation should be included.

EPA appreciates the opportunity to review the DEIS. Please send our office two copies of the FEIS, and an internet link, when it is sent to the Office of Federal Activities, EPA (Mail Code 2252A), Ariel Rios Federal Building, 1200 Pennsylvania Ave, N.W., Washington, D.C. 20004. Our classification will be published on the EPA website, www.epa.gov, according to our responsibility under Section 309 of the CAA to inform the public of our views on the proposed Federal action. If you have any questions or concerns, I can be reached at 214-665-8006, or contact Keith Hayden of my staff at hayden.keith@epa.gov or 214-665-2133.

Sincerely,

Debra A. Griffin
Associate Director, Compliance Assurance
and Enforcement Division

Enclosure

DETAILED COMMENTS ON THE NATIONAL PARK SERVICE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE LAKE MEREDITH NATIONAL RECREATION AREA, TEXAS

BACKGROUND: Lake Meredith was originally created by the construction of Sanford Dam on the Canadian River in 1965, and referred to as the Canadian River Project. The Dam and Lake were designed to provide water for cities in the Texas panhandle. In 1968, the Bureau of Reclamation turned over operation and maintenance of the Sanford Dam and facilities to the Canadian River Municipal Water Authority (CRMWA). The area was established as the Lake Meredith National Recreation Area under the jurisdiction of the National Park Service (NPS) in 1990 with the intent to provide diverse and affordable outdoor recreation opportunities. Today, the Lake Meredith National Recreation Area occupies portions of Moore, Hutchinson, Potter, and Carson counties. The recreation area is over 44,900 acres and the lake is the largest body of freshwater in the Texas panhandle. From 1971 through 2008 the recreation area averaged 1.5 million visitors annually. Two off-road vehicle (ORV) areas were established in the 1970's at the north and south ends of the recreation area. The type of vehicles used and the intensity of use have changed drastically since the ORV areas were established. This has negatively affected soil and vegetation resources, destroyed cultural resources, and led to a rise in visitor use conflicts.

The ORV Management Plan/EIS will assess potential environmental impacts associated with a range of alternatives for managing ORV impacts on park resources such as soils, wetlands, wildlife, cultural resources, visitor experience, and public safety. This effort will result in an ORV Management Plan/EIS that will be used to guide the management and control of ORV's at the Recreation Area for approximately the next 15 to 20 years.

EXECUTIVE SUMMARY

Executive Summary, Page xi

Alternative B includes issuing a no-cost permit for educational purposes, but it is unclear what educational purpose the permit would fulfill. The only education mentioned in the DEIS is through outreach with ORV users via bulletin boards and brochures, and the permits mentioned in the DEIS are for identifying ORV area users. These two measures are common to alternatives B, C, and D.

- Clarify the educational purposes alternative B would serve.

2.0 ALTERNATIVES

Alternative C, Page 52

Implementation of Alternative C would close the area east of Bull Taco Hill to all ORV use. The rationale for this action is never fully explained.

- Describe why closing down the area East of Bull Taco Hill was included in Alternative C. If this action was based on the need to protect natural or cultural resources; then explain why this action was not included in the other action alternatives.

5.0 CONSULTATION AND COORDINATION

Agencies, Organizations, and Individuals Consulted, Page 231

The DEIS does not contain a final determination on the environmental consequences of the alternatives to threatened and endangered species. The U.S. Fish and Wildlife Service (USFWS) was contacted for threatened and endangered species consultation, but there is not a concurrence from the USFWS on any conclusions reached in the DEIS.

- Include concurrence from the USFWS on the NPS determination for impacts of the proposed project to threatened and endangered species.

TRIBAL CONCERNS
Page 232

The DEIS lists ten Tribes that were contacted during the development of the plan, but does not indicate whether they were contacted for government-to-government consultation under E. O. 13175, National Historic Preservation Act (NHPA) consultation, or other reasons. Information, responses, and concerns to/from the listed Tribes were not specified in the DEIS, nor was there any indication of communication with Texas Tribes; including the Kickapoo Traditional Tribe, Ysleta Del Sur Pueblo, Alabama-Coushatta Tribe, and the Tonkawa Tribe. All of these tribes may have an interest in the proposed project location.

- Provide information in the Final EIS to document that all potentially affected Tribes were identified and contacted for both NHPA and E.O. 13175. The Texas State SHPO should also be contacted to provide concurrence on the conclusions reached in the DEIS concerning historic, cultural, or archeological resources. EPA recommends that the NPS continue to communicate and consult with the Tribes as the project progresses.

SOCIOECONOMICS
Page 18

The DEIS did not include any socioeconomic data concerning minority or low-income populations. Also, the NPS did not list Executive Order (E.O.) 12898 in the relevant laws section of the DEIS.

- Discuss the rationale for excluding E.O. 12898 and associated socioeconomic analyses in the Final EIS.

AIR QUALITY
Page 19

The DEIS analyzes a range of alternatives and actions for the management of off-road vehicle (ORV) use at the Lake Meredith National Recreation Area in the Texas panhandle, northeast of Amarillo. During the scoping process for the plan, topics such as air quality were not further analyzed because the impact level or frequency was not sufficient to warrant a full analysis. Existing air monitoring data in the area does not indicate an air quality problem (e.g., particulate matter) for the area, however, localized air quality impacts from ORV use can affect visitor experience, health and safety.

- EPA recommends that the project alternative selected include mitigation such as separation of visitor uses so that fugitive dust impacts during high wind events are minimized, planned ORV routes, or suspension of ORV use during excessive wind events.

Arlene

AMERICAN MOTORCYCLIST ASSOCIATION

101 Constitution Avenue NW, Suite 800W, Washington, DC 20001
T: (202) 742-4301 F: (202) 742-4304

AmericanMotorcyclist.com

Feb. 7, 2013

Cindy Ott-Jones
Superintendent
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch, Texas 79036-1460

Dear Superintendent Ott-Jones:

The American Motorcyclist Association is writing to you regarding your plan to release the new draft environmental impact statement managing off-highway-vehicle use in the Lake Meredith National Recreation Area published in the Federal Register on Jan. 25 [FR DOC No: 2013-01434].

The notice of availability is to allow public comments on the draft environmental impact statement. The AMA takes issue with alternatives B, C, and D in the DEIS because they would drastically restrict responsible OHV use in the Lake Meredith National Recreation Area.

According to the preferred plan (alternative D), the NPS intends to limit OHV access to a fraction of the area previously allowed. Additionally, the plan would require individual permits for different zones in the park, further complicating access for individuals and families who wish to take part in multiple activities per trip. Also, that requirement could potentially encourage illegal riding.

We have concerns that the DEIS does not fully take into account the social and economic costs of limiting access for responsible OHV riders. Furthermore, we do not believe the DEIS takes into account the safety and environmental impacts, such as trail congestion and overuse, from forcing riders into a smaller designated area.

The DEIS will unfairly limit access to an important recreation area. The preferred alternative will increase the costs associated with OHV use while, at the same time, limiting the areas available for responsible OHV use.

Thank you for your time and consideration of our comments.

Sincerely,

Wayne Allard

Wayne Allard
Vice President, Government Relations

PEPC Project ID: 20192, DocumentID: 51446
Correspondence: 65

Author Information

Keep Private:	No
Name:	Texas Off-Roaders Association N/A
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Correspondence Information

Status: Reviewed	Park Correspondence Log:
Date Sent: 03/26/2013	Date Received: 03/26/2013
Number of Signatures: 1	Form Letter: No
Contains Request(s): No	Type: Web Form
Notes:	

Correspondence Text

Texas Off-Roader's Association (TORA) official position for the National Park Service (NPS) planning proposal is Plan A (NO ACTION.) TORA's primary function is and always will be to protect the rights of OHV enthusiasts for present and future generations. We feel plan B, C and D are not options that will provide consistent and OHV user friendly options for the Texas Panhandle off-roaders. Again, any option other than (OPTION A) will unnecessarily restrict access and will infringe on the rights of the users of LAKE MEREDITH NATIONAL PARK RECREATIONAL AREA. Please be advised, in the event any option other than (Option A) is chosen, a formal petition process will be initiated.

Respectively,
Texas Off-Roaders Association Board of Directors
">

United States Department of the Interior
NATIONAL PARK SERVICE
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch. Texas 79036-1460

In reply refer to:
(1.A.2 LAMR)

RECEIVED
JUL 07 2014
Texas Historical Commission

July 1, 2014

Mr. Mark Wolfe
Texas Historical Preservation Officer
P. O. Box 122767
Austin, TX 78711-2276

RE: Section 106 for the Lake Meredith National Recreation Area Off-Road Vehicle Plan and Environmental Impact Statement

Dear Mr. Wolfe

In January 2013 we released the Draft Off-Road Vehicle Management Plan and Environmental Impact Statement (Plan/EIS) for public comment. At that time we received a request for additional information on the preferred alternative. We have addressed those questions below and are seeking concurrence with our finding of *no historic properties affected*.

In your letter to us you indicated that the Plan/EIS should reflect the presence of recorded sites within the boundaries of Lake Meredith National Recreation Area. We have corrected this mistake and revised language will be reflected in the Final Plan/EIS.

Your letter also indicated that there are recorded sites within the Rosita Flats and Blue Creek ORV areas. This is correct. Both areas have been surveyed for archeological resources. Those reports include:

William, Cloud. An Archeological Survey Along Big Blue Creek (Northwest and Southeast Burn Blocks), Lake Meredith National Recreation Area, Moore County, Texas, 2003,

Cason, Samuel. Further Archaeological Investigations Along Big Blue Creek (Southwest and Northeast Burn Blocks), Lake Meredith National Recreational Area, Moore and Potter Counties, Texas. 2003.

4 G Consulting. Archaeological Surveys in the North River Bottom and Rosita Flats Burn Units, Lake Meredith National Recreation Area, Potter County, Texas. 2005.

The preferred alternative for both Rosita and Blue Creek propose routes that avoid recorded archeological sites. Markers and barriers, as well as improved law enforcement efforts, are included as part of the preferred alternative, which will provide protection for these sites.

Therefore, in accordance with 36 CFR 800.4(d)(1), Lake Meredith National Recreation Area (LAMR) has determined that there would be *no historic properties affected* under the preferred alternative of the Plan/EIS.

If you concur with this determination of effect, please sign in the space provided below.

If you have any questions or comments, please contact Arlene Wimer, Chief of Resource Management at 806-857-0309.

Sincerely,

Robert J. Maguire
Superintendent
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument

CONCUR
by William D. Martin
for Mark Wolfe
State Historic Preservation Officer
Date 7/23/14
Track# 201411116

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
2005 NE Green Oaks Blvd., Suite 140
Arlington, Texas 76006

April 24, 2014

02ETAR00-2014-F-0054

Memorandum

To: Superintendent, Lake Meredith National Recreation Area, NPS, Fritch, TX

From: Acting Field Supervisor, FWS, Ecological Services, Arlington, TX

Subject: Lake Meredith Off-road Vehicle Management Plan Biological Opinion

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the National Park Service's (NPS) implementation of the Lake Meredith National Recreation Area (LMNRA) Off-road Vehicle (ORV) Management Plan and its effects on the federally listed Arkansas River shiner (*Notropis girardi* [ARS]). The LMNRA encompasses approximately 44,977 acres and is located in portions of Hutchinson, Moore, and Potter Counties, Texas. Proposed actions potentially affecting federally protected resources would occur within a 275-acre area in Moore County and within a 1,740-acre area in Potter County.

This biological opinion has been prepared in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.) The biological opinion is based on the Biological Assessment (BA) and the Draft Environmental Impact Statement (DEIS) included with your letter initiating consultation, information provided by NPS staff, and other sources of information. A complete administrative record of this consultation is on file at the Service's Arlington, Texas, Ecological Services Field Office.

Consultation History

April 28, 2009: Exchange of information between LMNRA NPS staff and Daniel Fenner and Ken Collins of USFWS' Oklahoma Ecological Services Field Office (OESFO) regarding potential impacts to ARS from recreation activities. NPS staff were made aware of responsibilities under section 7 of the Act and were advised on range of alternatives.

August 2, 2010: Further exchange between LMNRA NPS staff and OESFO. LMNRA NPS requested comments on draft alternatives prior to preparing impact

analysis. OESFO received copy of results of survey revealing ARS presence at all sampling points. Future agency coordination was discussed.

November 9, 2011: LMNRA NPS submitted latest draft of alternatives to USFWS for review.

November 25, 2013: LMNRA NPS provided USFWS' Arlington Texas Ecological Services Field Office (ARLESFO) with BA and DEIS for the implementation of the Lake Meredith National Recreation Area Off-Road Vehicle (ORV) Management Plan and requested formal consultation.

April 9, 2014 Draft BO sent to NPS

BIOLOGICAL OPINION

I. Description of Proposed Action

The LMNRA provides a variety of visitor experiences, including the use of ORV. ORV use has been authorized at the LMNRA since the 1970s (under CFR 7.57) in two designated areas: Blue Creek at the north end and Rosita Flats at the south end. Since this initial authorization, ORV use has changed drastically, both in intensity and in the types of ORVs used. This increased ORV use has led to detrimental effects to natural and cultural resources as well as visitor use conflicts.

Executive Order 11644, "Use of Off-road Vehicles on Public Lands" (issued in 1972 and amended by Executive Order 11989 in 1977), requires Federal agencies that allow ORV use to designate specific areas and routes on public lands where the use of ORVs may be allowed. Therefore, motorized travel off established roads would not be permitted in any areas unless designated under a special regulation. Section 3 of this executive order, as amended, authorizes the NPS to designate ORV use areas provided that the designation of such areas and trails would be based on protecting the resources of public lands, promoting the safety of all users of those lands, and minimizing conflicts among the various uses on those lands. Executive Order 11644 was issued in response to the widespread and rapidly increasing use of ORVs on public lands "often for legitimate purposes but also in frequent conflict with wise land and resource management practices, environmental values, and other types of recreational activity."

As a result of these considerations, the LMNRA proposes to implement the Lake Meredith National Recreation Area Off-road Vehicle Management Plan in order to:

- Comply with Executive Order 11644
- Provide for sustainable recreational ORV use areas
- Address the lack of an approved plan, which has led to ORV use outside authorized areas
- Address the change in numbers, power, range, and capabilities of ORVs
- Address resource impacts resulting from ORV use (including impacts to the ARS for reasons discussed in the "Effects of the Action" section of this opinion)

The NPS evaluated several project alternatives and selected "Alternative D: Management Through Use of a Zoning and Permitting System at Current Off-road Vehicle Use Areas" as their preferred alternative. Alternative D was selected as the environmentally preferable alternative

and is the proposed action for section 7 consultation. NPS identified this alternative as environmentally preferable because it would establish numerous management measures that would reduce the impact of ORV use on the landscape in both the Blue Creek and Rosita Flats areas. These measures include the following:

- The establishment of ORV routes and areas in either sand bottom areas (Blue Creek) or on already disturbed trails. Routes and areas would be clearly marked so users would be better able to avoid unknowingly going off trail.
- The overlay of specified zones that would reduce the intensity of use in some areas. In these areas, restrictions on vehicle size would result in less damage to soils and provide a better opportunity for other resources, such as vegetation, to recover. Camping zones with lower ORV speed limits would be established in which camping and campfires would be allowed.
- Designated river crossings that would better protect ARS habitat in addition to restrictions that would prevent driving in isolated pools during times of drought.
- A permit system that would provide educational materials to users to keep them informed on how they can best use ORV use areas while also promoting resource protection.

The action area for the proposed project includes the anticipated extent of the direct and indirect effects. The Service has determined the action area to be approximately 2,015 acres consisting of a 275-acre area in Moore County and a 1,740-acre area in Potter County. Actions potentially impacting the ARS would only occur within the 1,740-acre area in Potter County known as Rosita Flats within and adjacent to the Canadian River (Figure 1). Therefore, the Rosita Flats area alone will be the analysis area of this biological opinion.

Minimization Measures: The proposed action also includes several conservation measures to avoid and minimize potential adverse impacts to ARSs as well as other aquatic and shoreline habitat dwelling species. These measures currently include:

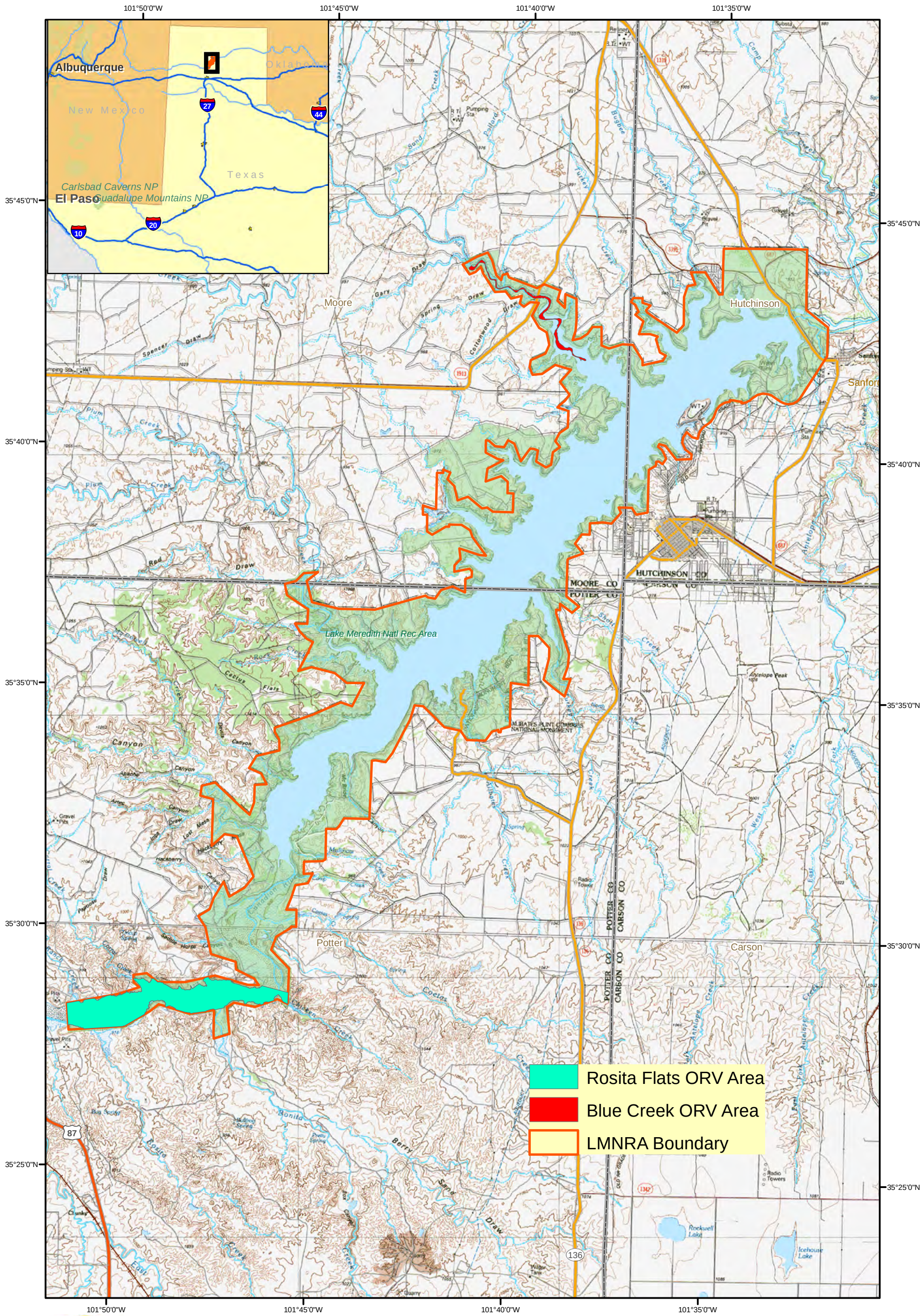
- No parking or staging of vehicles of any kind adjacent to or in the Canadian River

- Access to the Canadian River would be allowed only from designated access points

- A Resource Protection Zone would be established within Rosita Flats within which only vehicles with a wheel width of 64 inches or less would be allowed

- Educational materials would be provided when a visitor obtains an ORV use permit. These materials would include information about the prohibition of driving in isolated pools or entering and leaving the Canadian River at undesignated access points, as well as other information about the ARS. This pamphlet would contain the statement, "The USFWS recommends during low water that ORV users do not drive in the Canadian River but cross the channel when needed."

- Additional information on ARS protection would be provided on the existing park bulletin boards and any boards or kiosks added at campground areas.



U.S. Fish & Wildlife Service

Arlington, Texas, Ecological Services Field Office
Projection: UTM Zone 14N, NAD 1983, GRS 1980
Production Date: 4/17/2014

0 850 1,700 Miles
0 1,500 3,000 Kilometers

Texas

Figure 1: Lake Meredith NRA - Off-road Vehicle Management Plan Action Area

- The superintendent always retains the authority to close any portion of the National Recreation Area for protection of park resources.

II. Status of the Species

The current list of federally threatened (T), endangered (E), and candidate (C) species that are known to occur, or have been documented in Moore and Potter Counties consists of the following:

Arkansas River shiner (*Notropis girardi*) – T, Moore, Potter
whooping crane (*Grus americana*) – E, Potter
lesser prairie-chicken (*Tympanuchus pallidicinctus)* – T, Moore

Whooping cranes have the potential to pass through the general vicinity during their annual migration, but have not been documented within or adjacent to the LMNRA in the recent past. Habitat along the shoreline is not considered preferred habitat; however, it is possible that whooping cranes could potentially utilize the shoreline briefly as a migration stopover. However, the probability of this occurrence would be minimal and could not be meaningfully measured. For this reason, the proposed action is not likely to adversely affect whooping cranes. Therefore, this species will not be discussed further in this biological opinion, and no take of this species is authorized.

The lesser prairie-chicken is currently in the federal listing process and is expected to be listed as threatened on May 12, 2014. Regardless, preferred habitat for lesser prairie-chicken does not appear to be present within the action area and adverse impacts to this species would not be expected.

The federally listed endangered species that does occur in the action area and that may be affected by the proposed action is the ARS. The ARS is a small, robust minnow with a small, dorsally flattened head, rounded snout, and small subterminal mouth (Miller and Robison 1973; Robison and Buchanan 1988). Dorsal coloration tends to be light tan, with silvery sides gradually grading to white on the belly. Adults attain a maximum length of about 2 inches. Dorsal, anal, and pelvic fins all have eight rays, and there is usually a small, black chevron present at the base of the caudal fin. The ARS was listed as a threatened species on November 23, 1998, based on reductions of the species' range and numbers due to habitat destruction and modification, stream dewatering, diversion of surface water, groundwater pumping, construction of impoundments, and water quality degradation (USFWS 1998).

On April 4, 2001, critical habitat for this species was designated (66 *FR* 18002). This critical habitat designation was vacated as a result of a September 2003 Memorandum Opinion of the U.S. District Court of the District of New Mexico, and on October 6, 2004, a new critical habitat designation for the Arkansas River basin population of the ARS was proposed (69 *FR* 59859). A final designation of critical habitat for the Arkansas River basin population of the ARS was published on October 13, 2005 (70 *FR* 59808), which does not include the portion of the Canadian River within the proposed action area.

The ARS was first reported in 1926 from the Cimarron River northwest of Kenton, Cimarron County, Oklahoma (Hubbs and Ortenburger 1929). Historically, the ARS was widespread and abundant throughout the western portion of the Arkansas River basin in Kansas, New Mexico, Oklahoma, and Texas. This species has subsequently disappeared from over 80 percent of its historical range and is now almost entirely restricted to about 508 miles of the Canadian River in New Mexico, Oklahoma, and Texas. A nonnative, introduced population of the ARS occurs in the Pecos River in New Mexico (Bestgen *et al.* 1989). That population is not protected under the Act.

The ARS is now believed to be extirpated from the entire Arkansas River. An extremely small population may still persist in the Cimarron River in Oklahoma and Kansas, based on the collection of only 22 individuals since 1985. A remnant population also may persist in the Beaver/North Canadian River of Oklahoma, based on collection of only four individuals since 1989 (Larson *et al.* 1991; Pigg 1991). However, samples collected by Wilde (2002) at 10 sites along the Beaver/North Canadian River in 2000 and 2001 found no ARS, suggesting that the ARS may be extirpated from that river. An accurate assessment of ARS populations in the Cimarron and Beaver/North Canadian Rivers is difficult because the populations are likely so small that individuals may escape detection during routine surveys.

Habitat

The ARS historically inhabited the main channels of wide, shallow, sandy-bottomed rivers and larger streams of the Arkansas River basin (Gilbert 1980). Adults are uncommon in quiet pools or backwaters, and almost never occur in tributaries having deep water and bottoms of mud or stone (Cross 1967). Polivka and Matthews (1997) suggested that juvenile ARS associate most strongly with current, conductivity (related to total dissolved solids), and backwater and island habitat types. Cross (1967) believed that adults preferred to orient into the current on the lee sides of transverse sand ridges and feed upon organisms washed downstream.

Matthews (1987) classified several species of fishes, including the ARS, based on their tolerance for adverse conditions and selectivity for physicochemical gradients. The ARS was described as having a high thermal and oxygen tolerance, indicating a high capacity to tolerate elevated temperatures and low dissolved oxygen concentrations (Matthews 1987). Observations from the Canadian River in New Mexico and Texas revealed that dissolved oxygen concentrations, conductivity, and pH rarely influenced habitat selection by the ARS (Wilde *et al.* 2000). ARS specimens were collected over a wide range of conditions–water temperatures from 32.7 to 98.2° Fahrenheit (0.39 to 36.78° Celsius), dissolved oxygen from 3.4 to 16.3 parts per million, conductivity (total dissolved solids) from 0.7 to 14.4 millisiemens per centimeter, and pH from 5.6 to 9.0.

In the Canadian River of central Oklahoma, Polivka and Matthews (1997) found that ARS exhibited only a weak relationship between the environmental variables they measured and the occurrence of the species within the stream channel. Water depth, current, dissolved oxygen, and sand ridge and midchannel habitats were the environmental variables most strongly associated with the distribution of ARS within the channel. Similarly, microhabitat selection by ARS in the Canadian River of New Mexico and Texas was influenced by water depth, current velocity, and, to a lesser extent, water temperature (Wilde *et al.* 2000). The ARS specimens

generally occurred at mean water depths between 6.6-8.3 in (17 and 21 cm) and current velocities between 11.7 and 16.4 in (29.7 and 41.6 cm) per second. Juvenile ARS associated most strongly with current, conductivity, and backwater and island habitat types (Polivka and Matthews 1997).

Wilde *et al.* (2000) found no obvious selection for, or avoidance of, any particular habitat type (*i.e.*, main channel, side channel, backwaters, and pools) by ARS. The ARS specimens did tend to select side channels and backwaters slightly more than expected based on the availability of these habitats (Wilde *et al.* 2000). Likewise, they appeared to make no obvious selection for, or avoidance of, any particular substrate type. Substrates in the Canadian River in New Mexico and Texas were predominantly sand; however, the ARS was observed to occur over silt slightly more than expected based on the availability of this substrate (Wilde *et al.* 2000).

Food Habits/Feeding Behavior

The ARS is believed to be a generalized forager and feeds upon both items suspended in the water column and items lying on the substrate (Jimenez 1999, Bonner *et al.* 1997). In the Canadian River of central Oklahoma, Polivka and Matthews (1997) found that gut contents were dominated by sand/sediment and detritus (decaying organic material), with invertebrate prey being an incidental component of the diet. In the Canadian River of New Mexico and Texas, the diet of ARS was dominated by detritus, invertebrates, grass seeds, and sand and silt (Jimenez 1999). Invertebrates were the most important food item, followed by detrital material.

Terrestrial and semiaquatic invertebrates were consumed at higher levels than were aquatic invertebrates (Jimenez 1999). With the exception of the winter season, when larval flies were consumed much more frequently than other aquatic invertebrates, no particular invertebrate taxa dominated the diet (Bonner *et al.* 1997). Fly larvae, copepods, immature mayflies, insect eggs, and seeds were the dominant items in the diet of the nonnative population of the ARS inhabiting the Pecos River in New Mexico (Keith Gido, University of Oklahoma, *in litt.* 1997).

Reproduction

Successful reproduction by the ARS appears to be strongly correlated with streamflow. Moore (1944) believed the ARS spawned in July, usually coinciding with elevated flows following heavy rains associated with summertime thunderstorms. Bestgen *et al.* (1989) found that spawning in the nonnative population of ARS in the Pecos River of New Mexico generally occurred in conjunction with releases from Sumner Reservoir. However, recent studies by Polivka and Matthews (1997) and Wilde *et al.* (2000) neither confirmed nor rejected the hypothesis that elevated streamflow triggered spawning in the ARS.

ARS specimens are open-water, broadcast spawners that release their eggs and sperm over an unprepared substrate (Platania and Altenbach 1998, Johnston 1999). Examination of ARS gonadal development between 1996 and 1998 in the Canadian River of New Mexico and Texas demonstrated that the species undergoes multiple, asynchronous spawns in a single season (Wilde *et al.* 2000). The ARS appears to be in peak reproductive condition throughout the months of May, June, and July (Wilde *et al.* 2000, Polivka and Matthews 1997); however,

spawning may occur as early as April and as late as September. ARS specimens may, on occasion, spawn in standing waters (Wilde *et al.* 2000), but it is unlikely that such events are successful.

Both Moore (1944) and Platania and Altenbach (1998) described behavior of ARS eggs. The fertilized eggs are nonadhesive and semibuoyant. Platania and Altenbach (1998) found that spawned eggs settled to the bottom of the aquaria where they quickly absorbed water and expanded. Upon absorbing water, the eggs became more buoyant, rose with the water current, and remained in suspension. The eggs would sink when water current was not maintained in the aquaria. This led Platania and Altenbach (1998) to conclude that the ARS and other plains fishes likely spawn in the upper to mid-water column during elevated flows. Spawning under these conditions would allow the eggs to remain suspended during the 10- to 30-minute period the eggs were non-buoyant. Once the egg became buoyant, it would remain suspended in the water column as long as current was present.

In the absence of sufficient streamflows, the eggs would likely settle to the channel bottom, where silt and shifting substrates would smother the eggs, hindering oxygen uptake and causing mortality of the embryos. Spawning during elevated flows appears to be an adaptation that likely increases survival of the embryo and facilitates dispersal of the young. Assuming a conservative drift rate of 3 km/hour, Platania and Altenbach (1998) estimated that the fertilized eggs could be transported 45-89 mi (72-144 km) before hatching. Developing larvae could then be transported up to an additional 134 mi (216 km) before they were capable of directed swimming movements. Bonner and Wilde (2000) speculate that 135 mi (218 km) may be the minimum length of unimpounded river that allows for the successful completion of ARS life history, based on their observations in the Canadian River in New Mexico and Texas.

Rapid hatching and development of the young is likely another adaptation in plains fishes that enhances survival in the harsh environments of plains streams. ARS eggs hatch in 24-48 hours after spawning, depending upon water temperature (Moore 1944, Platania and Altenbach 1998). The larvae are capable of swimming within 3-4 days; they then seek out low-velocity habitats, such as backwater pools and quiet water at the mouths of tributaries where food is more abundant (Moore 1944).

Evidence from Wilde *et al.* (2000) indirectly supports the speculation by Cross *et al.* (1985) that the ARS initiates an upstream spawning migration. Whether this represents a true spawning migration or just a general tendency in these fish to orient into the current and move upstream, perhaps in search of more favorable environmental conditions, is unknown (Wilde *et al.* 2000). Regardless, strong evidence suggested the presence of a directed, upstream movement by the ARS over the course of a year.

Age and Growth

Maximum longevity is unknown, but Moore (1944) speculated that the species' life span is likely less than 3 years in the wild. The age structure of ARS collected from the Pecos River in New Mexico included three, and possibly four, age classes (Bestgen *et al.* 1989). The majority of the fish captured were juveniles (Age-0) and first-time spawners (Age-I). Most of the fish in spawning condition were Age-I. Bestgen *et al.* (1989) thought mortality of postspawning fish

was extremely high based on the absence of Age-I and older fish from collections made after the spawning period (late July and August).

Diseases, Parasites, and Predation

No studies have been conducted on the impact of disease or predation upon the ARS; therefore, the significance of these threats upon existing populations is unknown. There is no direct evidence to suggest that disease threatens the continued existence of the species. Disease is not likely to be a significant threat except in isolated instances or under certain habitat conditions, such as crowding during periods of reduced flows, or episodes of poor water quality (e.g., low dissolved oxygen or elevated nutrient levels). During these events, stress reduces resistance to pathogens and disease outbreaks may occur. Parasites and bacterial and viral agents are generally the most common causes of mortality. Lesions caused by injuries, bacterial infections, and parasites often become the sites of secondary fungal infections.

Some predation of ARS by largemouth bass *Micropterus salmoides*, green sunfish *Lepomis cyanellus*, channel catfish *Ictalurus punctatus*, and other fish species undoubtedly occurs, but the extent is unknown. Predation by aquatic birds (e.g., terns, herons, and egrets) and aquatic reptiles (e.g., snakes and turtles) also may occur. Plains fishes have evolved under adverse conditions of widely fluctuating, often intermittent flows, high summer temperatures, high rates of evaporation, and high concentrations of dissolved solids. These conditions are not favored by most large predaceous fish and tend to preclude existence of significant populations of these species. However, alteration of historic flow regimes and construction of reservoirs have created favorable conditions for some predatory species such as white bass *Morone chrysops* and striped bass *M. saxatilis*. State and Federal fish and wildlife management agencies, through cooperative efforts to develop sport fisheries in these reservoirs, have facilitated expansion of the distributions of some predatory species. The impact of predation to the species is likely to be localized and insignificant, particularly where habitat conditions upstream of mainstem reservoirs are not favorable to the long-term establishment of abundant predatory fish populations.

Factors Contributing to Decline

The ARS very likely no longer exists in the Arkansas River in Arkansas, Kansas, and Oklahoma, which is a loss of over 770 miles (1,240 kilometers) of previously occupied habitat (69 FR 59861). The decline of the shiner is primarily the result of modification of the duration and timing of streamflows, habitat loss by inundation, stream depletion due to water diversion and groundwater pumping, water quality degradation (caused by oil and gas, municipal sewage effluent, and manufacturing return flows), competition with invasive nonnative species, and the construction of impoundments (70 FR 59828; USFWS 2009). The fragmentation of streams and rivers, particularly with the construction of reservoirs, throughout the Great Plains has likely acted to increase the frequency of reproductive failure among broadcast spawning species in these systems through restricting the upstream movement of adults to spawn, leaving drifting eggs without sufficient distance to develop and hatch before being transported into lentic habitats (Durham and Wilde 2008, NPS 2013).

III. Environmental Baseline

a. Status of the species within the action area.

The LMNRA is located near the geographic center of the Texas Panhandle, about 40 miles northeast of Amarillo and 9 miles west of Borger. It is composed of approximately 45,000 acres within its boundaries (NPS 2009) and encompasses portions of Hutchinson, Moore, and Potter Counties. The Action Area consists of two separate areas within LMNRA: the 275-acre Blue Creek ORV Use Area located on the northwest side of the lake, and the 1,740-acre Rosita Flats ORV Use Area located in the southernmost section of LMNRA. The ARS occurs only within the Rosita Flats portion of the Action Area and is the primary analysis area of this biological opinion.

Within the LMNRA, the Canadian River has carved a narrow, steep walled canyon from 200 to 300 feet deep and up to two miles wide. Between this canyon and caprock, many tributary streams have caused a rough and broken topography known as the Canadian River Breaks. The completion of the Sanford Dam in 1965 between these breaks created Lake Meredith (NPS 2013). The LMNRA lies within the Canadian/Cimarron Breaks sub-ecoregion which lies within the Southwestern Tablelands ecoregion of Texas. The Southwestern Tablelands flank the High Planes with red hued canyons, mesas, and dissected river breaks. Much of this ecoregion is in sub-humid grassland and semiarid rangeland. Vegetation consists of grama-buffalograss with some mesquite-buffalograss in the southeast, juniper-scrub oak-midgrass savanna on the escarpment bluffs, and shinnery (midgrass prairie with low oak brush) along parts of the Canadian River. Soils in this ecoregion include alfisols, inceptisols, entisols, and millisols (Griffin *et al.* 2004). Soil erosion at Rosita Flats (where the ARS is present) has occurred over the last 40 years primarily due to the use of ORVs above the 3,000-foot elevation contour. On hillsides with slopes of 15 degrees or more, the soils often erode during and after rainfall events due to the presence of steep slopes combined with the removal of vegetation by ORV use (NPS 2013).

Within the LMNRA property and immediately adjacent, the ARS is known to be present in the Canadian River from Chicken Creek upstream to the U.S. Highway 287 Bridge, a large porting of this stretch running through the Rosita Flats ORV use area (NPS 2013). The ARS does not occur in the Blue Creek ORV Use Area and LMNRA staff are unaware of any historical existence of the species in this area (NPS 2013). In addition, the Blue Creek ORV use area does not contain habitat that would be conductive to support future ARS populations (NPS 2013).

The ARS is abundant in the LMNRA in the Canadian River from Chicken Creek upstream to the U.S. 287/State Highway 87 Bridge according to survey efforts of Dr. Gene Wilde (NPS 2010). Dr. Wilde and his assistants conducted quarterly surveys in this area between May 2009 and January 2010 to document the presence and abundance of the ARS at eight survey sites within the Rosita Flats ORV use area and at one survey site at the U.S. Highway 87 bridge outside the LMRA boundary. During the four quarterly sampling events, a total of 4,383 fish representing 16 species and 5 families were captured, identified, and released. During the surveys a total of 1,378 ARSs were collected, making it the most commonly captured fish, representing 31% of the collected assemblage (NPS 2010).

In the spring survey, ARS represented 16% of the fish captured and was the third most commonly collected fish. In the summer survey, ARS represented 23% of the fish captured and was the second most commonly collected fish. The ARS was the most commonly collected fish in both the fall and winter surveys, representing 47% and 58% respectively of the total number of captured fish (NPS 2010). Across all sites, ARS occurred at 18% of spring sampling sites, 63% of summer sampling sites, 38% of fall sampling sites, and 24% of winter sampling sites (NPS 2010). Upstream migration during spawning may explain the reduction in ARS abundance in the spring samples.

b. Factors affecting species environment within the action area

The damming of the Canadian River is likely the most significant adverse impact to the ARS within the action area. Impoundments function as barriers, fragmenting populations and habitat into smaller, more isolated units. As noted prior, inundation of riverine systems increases the frequency of reproductive failure among broadcast spawning species in these systems through restricting the upstream movement of adults to spawn, leaving drifting eggs without sufficient distance to develop and hatch before being transported into lentic habitats (Durham and Wilde 2008, NPS 2013). Wilde *et al.* (2000) suggested that an unimpounded stretch of the river approximately 137 miles (220.5 km) long may be necessary for the ARS to complete its life cycle. Inundation of rivers also produces increased abundance of predatory fish that feed on smaller fish like the ARS both upstream and downstream of reservoirs. Additionally, these fragmented sections are more likely to be affected by influences from external factors (*e.g.,* localized drought, water withdrawals, permitted and unpermitted wastewater discharges). Once isolated, other aggregations of ARS can no longer disperse into these reaches and help maintain or restore populations of ARS there. Due to the inundation of the Canadian River at LMNRA, suitable habitat no longer exists for the ARS downstream of Chicken Creek to the Sanford Dam. To our knowledge the ARS was last documented downstream of Sanford Dam in Texas at the intersection of the Canadian River and State Highway 152 in Hutchinson County (USFWS 2002). Since 2002, numerous USFWS surveys have failed to collect ARSs below Lake Meredith in Texas. Surveys further downstream into Oklahoma have located ARSs, however recent drought conditions have significantly lowered total ARS numbers in the South Canadian River (Daniel Fenner, personal communication, April 24, 2014).

Lack of rainfall, pumping for local use, and the spread of salt cedar (*Tamarisk* spp.) has caused a decline in water levels in the region having a direct effect on ARS habitat (NPS 2013). As water resources become scarcer, the capillary effects of increased groundwater pumping may cause isolated pools present in the Canadian River in summer to dry up. Some of these isolated pools within Rosita Flats have been documented to contain stranded ARSs (NPS 2010). Invasive nonnative salt cedar present in the area spreads quickly and uptakes large amounts of water as well. As water levels have dropped, salinity levels rise potentially causing further stress and mortality to ARSs (NPS 2013).

Gas and Oil Development activities are ongoing outside LMNRA which may impact the action area. Associated land clearing for siting and road construction may negatively affect ARS habitat through erosion and sedimentation. Also of concern is the use of water resources for gas and oil extraction as well as the potential for surface and groundwater contamination.

Implementation of the LMNRA Fire Management Plan has reduced woody vegetation possibly generating negative impacts to the ARS in the form of increases in stream temperature, leading to stress-induced mortality especially during summer conditions where shade over isolated pools might be beneficial (CRMWA 2005, NPS 2013). This decrease in woody vegetation may also have resulted in increased access to the Canadian River by ORV users and the associated adverse impacts. Burning of vegetation may have resulted in increased levels of eroded materials entering the Canadian River, which may result in adverse impacts to ARS through the loss of instream habitat, loss of spawning substrate, channel incision, and increased/altered instream velocities (CRMWA 2005, NPS 2013).

The 1973 Lake Meredith National Recreation Area Master Plan was developed to ensure that the aesthetic and biological qualities would be maintained at a standard which would serve its users most effectively. This Master Plan also designated the Rosita Flats portion of the study area for recreational use (including ORVs), likely contributing to the historical degradation of ARS habitat well before the present ORV Management Plan was proposed. However, the development of resource management objectives and the establishment of natural environment areas within the 1973 Master Plan likely contributed to portions of Rosita Flats being less degraded than if the Plan had not been implemented (NPS 2013).

Surveying to monitor the ARS population at LMNRA could have adverse impacts on individual fish due to the stress associated with capture by seine and the handling required to sex, weigh, and mark fishes. However, the adverse impacts to individuals are expected to be outweighed by the benefits to the species from the information gained from the monitoring studies, which may be used to direct future species management efforts. Information gained from monitoring the ARS population at LMNRA may result in increased management actions, such as further ARS habitat protection and enhancement efforts, which may benefit the ARS.

Primary potential sources of adverse impact to the ARS from recreational activities within the action area include ORV use, camping, picnicking, and hunting (NPS 2013), which have contributed to habitat depletion and destruction. In addition to the direct impacts to ARS habitat as a result of these activities, indirect impacts, such as impacts to water quality from vehicles and trash, have also caused impacts as a result of visitor use (NPS 2013).

In the LMNRA, it is common for the Canadian River and inflow streams to dry up during summer conditions, leaving fish congregated in small to large isolated pools. ORVs driven through these isolated pools pose a threat to the congregated fish species, including the ARS (Arlene Wimer, Paul Jones, and Jeremy Stevens, personal communications). Dr. Gene Wilde added that ARS specimens sampled from the Canadian River in isolated pools during summer drought showed higher levels of stress indicators, such as parasites and poor nutrition, than those sampled in more favorable habitat conditions. These stranded individuals therefore may be more likely to be harmed or killed by added disturbances such as being trampled or splashed out of the pools by repeated ORV traffic, and/or by the resulting degradation of habitat quality from increased turbidity, loss of vegetation along margins, and accelerated water loss (Dr. Gene Wilde, personal communication, March 24, 2014). Appendix A contains several photographs provided by Dr. Wilde which illustrate fish stranded in shrinking pools in the Canadian River

and some of the apparent effects of ORVs driven through these pools. Additionally, appendix B contains the preliminary results of an April 2014 field experiment conducted within the Canadian River by Dr. Wilde illustrating the direct mortality of fish stranded in pools resulting from a motor vehicle passing through.

IV. Effects of the Action

The proposed action consists of the implementation of the Lake Meredith Off-road Vehicle Management Plan for recreational use. Implementation of the Lake Meredith Off-road Vehicle Management Plan would designate specific routes and areas for ORV use in the Blue Creek and Rosita Flats areas of LMNRA. A fee-based permit system would also allow the NPS to provide additional amenities and increased enforcement in the action area. The Biological Assessment for the Lake Meredith Off-road Vehicle Management Plan / Environmental Impact Statement provided descriptions of proposed actions likely to adversely affect the ARS (NPS 2013). Quantitative measurements of length and area of proposed actions and property perimeters were calculated using shapefiles provided by NPS and utilizing ArcGIS software (version 10.1). The Service anticipates that direct and indirect adverse effects to the ARS would result from the action as discussed below.

ORVs cause long-lasting damage to land and aquatic ecosystems, wildlife, soils, and hydrologic flows and this is expected to occur in the action area. Even if all ORV users stayed in designated routes and areas, their activities may contribute to erosion and stream sedimentation, transport invasive species, disrupt and damage wildlife, and reduce habitat quality (Taylor n.d., NPS 2013). Motorized road and trail crossings through aquatic habitats degrade water quality, affect bank stability, damage riparian vegetation, and increase stream deposition, thus reducing habitat quality for aquatic species, including fish and their aquatic insect food sources (New Mexico EMNRD *et al.* 2008, NPS 2013). Soils classified as having moderate or high erosion potential are present along the edges of the Rosita Flats ORV use area. Sedimentation of surface waters of the LMNRA would continue to result from the ongoing erosion of soils due to ORV use. Incremental contributions to existing surface water quality impairments would also result from increased sediment runoff as well as runoff of gasoline or oil that may be leaked from ORVS (CRMWA 2005; Taylor n.d.; NPS 2013).

The individual elements of the Off-road Vehicle Management Plan necessitating section 7 consultation, and their corresponding direct and indirect impacts to the ARS, are as follows:

1. Designated Vehicle Routes/Areas

Direct Effects

The continued use of ORVs at Rosita Flats would likely result in additional habitat disturbance and disruption of the reproductive cycle due to the potential for injury and direct mortality during all life stages, leading to adverse impacts to ARSs. Implementing designated ORV access pointes at the riverbed and resource protection zones may likely have a beneficial effect on ARS by limiting ORVs from driving through riparian habitat and localizing impacts to certain areas. However, long-term adverse impacts to ARSs would persist from the continued presence of

ORVs in the riverbed. Sign posting and the use of post and cable fencing along ORV routes and indicating ORV use boundaries may help mitigate some of the adverse impacts of ORV use by preventing ORVs from driving through isolated pools possibly containing congregated ARSs.

Indirect Effects

ORV use at Rosita Flats would result in continued habitat/channel degradation due to erosion and aggradation due to sedimentation. Soil erosion may be increased by the compaction and rutting caused by vehicle tracks (Taylor n.d.), which in turn can lead to more sediment entering streams. This may result in turbidity, loss of instream habitat, loss of spawning substrate, channel incision, and increased stream velocities in ARS habitat (CRMWA 2005). These habitat changes may reduce the foraging and reproductive success of ARSs. Prohibiting ORV outside specified routes/areas as specified in the ORV Management Plan may reduce these erosion impacts by decreasing the overall footprint of ORV traffic and by maintaining the soil stabilizing effects of plant roots recolonizing untraveled areas. Continued ORV use at Rosita Flats may also result in the continued occurrence of trash entering streams, contributing to the degradation of ARS habitat. The ORV Management Plan includes efforts to minimize these waste disposal impacts through education and outreach provided to visitors. ORV use occurs off of LMNRA property upstream of Rosita Flats which can also contribute to reduced habitat quality for ARS both off and on LMNRA property by introducing additional turbidity and sedimentation. Identification of Sensitive Resource Areas through signage and fencing may have the indirect, and unintended, effect of encouraging vandalism or intentional destruction of these areas by identifying their locations.

2. Zone System

Direct Effects

Establishing 1,040 acres of Resource Protection Zones, where ORVs with a wheel width greater than 64 inches would not be permitted, would be intended to reduce the size and volume of ORV traffic in these areas. Additional measures are expected to minimize, but not eliminate the potential incidental take of ARSs by restricting the number of locations to four where ORVs can access the river, and limiting the number of ORVs overall, potentially reducing ORVs that come into contact with ARSs.

Indirect Effects

Establishing designated ORV use zones in already degraded areas of Rosita Flats and prohibiting the use of ORVs in vegetated resource protection zones is expected to limit increases in soil erosion, sedimentation, and water quality degradation in ARS habitat. By keeping ORVs in designated non-vegetated zones, preservation of existing vegetation is expected to help maintain water quality by controlling erosion in these areas due to root structure and the wind diffusing effects of the vegetation. Improvements to the road and designated camping zone at Rosita Flats are expected to reduce the impacts of erosion, sedimentation, and water quality degradation resulting from use of this area. Establishment of a hunting zone may result in a decrease of recreational ORV use during rifle season (up to two months) because ORV use in these areas

would be restricted to hunters. Additionally, the establishment of camping-only zones may reduce impacts to water quality due to the prohibition of ORV use in these areas.

3. Permit Requirements

Direct Effects

Temporary closures of the ORV use areas if evidence of ORV use is found outside designated routes, as well as the implementation of a permit system could reduce impacts of ORV use on ARSs by encouraging ORV users to stay on designated routes. This action could help to preserve ARS habitat and reduce the incidence of direct mortality. The fee-based permit would also include an ORV user education component informing permit holders about resource protection.

Indirect Effects

Considering that only permitted ORV users would be allowed access to Rosita Flats, it is hopeful that these "informed" persons would follow the rules learned through the permitting process, in turn potentially reducing impacts to ARSs and their habitats. This would be in the form of reduced trash and leakage of fluids from ORVs in the water, and reducing the use of ORVs outside of designated areas. Repeat offenders would face revocation of permits, possibly eliminating the presence of users who may impact ARSs most severely.

4. Vehicle Requirements

Underage ORV users would be required to be accompanied by an adult, hopefully leading to greater compliance with LMNRA rules including those that contribute to resource protection.

Indirect Effects

The requirement of spark arresters on ORVs would decrease the possibility of wildfires thereby reducing the likelihood of impacts to water quality associated with fire-induced erosion and loss of vegetation.

5. Speed Limits

Direct Effects

None.

Indirect Effects

Speed limits may increase compliance with avoiding areas closed to ORV use (such as ARS inhabited pools) because operators may be more likely to maneuver around these areas while traveling at reduced speeds.

6. Education and Outreach

Direct Effects

Along with education provided within the ORV use permitting process, additional visitor education would inform users of LMNRA about the habitat and status of the ARS. This would hopefully result in greater compliance with rules designed to reduce impacts to ARSs and their habitats.

Indirect Effects

Increased education may result in increased compliance with ORV regulations, reducing impacts to water quality from erosion, loss of vegetation, and chemical leakage.

7. Camping, Campfires, and Other Amenities

Direct Effects

During construction activities for various future amenities, the resulting erosion and sedimentation may impact ARS habitat. Erosion and runoff from these construction sites would be minimized by following best management practices.

Indirect Effects

Construction of new visitor amenities may result in adverse indirect impacts related to increased visitor usage of the area. LMNRA will make efforts to locate amenities away from ARS habitats.

8. Enforcement

Direct Effects

Increased law enforcement may likely result in greater compliance with ORV regulations. This may result in benefits to ARS habitats when compared to current management practices.

Indirect Effects

Increased compliance with ORV regulations could result in less trash and less erosion and sedimentation entering ARS habitats resulting in beneficial indirect impacts to water quality, when compared to current management practices.

V. Cumulative Effects

Cumulative effects include the environmental baseline in addition to the additive effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed

action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Activities potentially resulting in cumulative effects to the ARS and/or its habitat in the action area are as follows:

1. **Revised Texas Wildlife Action Plan** – The goal of this plan is to conserve and improve the status of species of greatest conservation need and the habitats upon which they rely to prevent listings under the Act. This plan is the natural resources conservation plan for all of Texas (TPWD 2012, NPS 2013). This plan could have potential beneficial impacts to ARSs within the action area if the recommended monitoring is conducted and the data are used to identify needs and direct future resource management.

2. **Continued Hunting** – Hunting activities occur at various times during the year increasing the recreational use of the area and the associated strain on natural resources potentially negatively affecting the ARS.

3. **Continued Invasive Species Removal** – This may involve hand application of herbicides and some minor mechanical removal within the action area. This could potentially negatively affect the ARS if herbicides reach the water. Removal may also produce negative effects associated with increased stream temperature, increased erosion if replanting does not take place, and increased access to the stream from ORVs. Beneficial impacts may include increasing base flows in the Canadian and reducing salinity. Salt cedar is a target species known to uptake large amounts of water and to draw salts to the surface from deep within the ground.

4. **Future Mesquite Spraying on Adjacent Lands** – Past land use practices on adjacent lands have included the spraying of mesquite. This could negatively impact water quality for the ARS if aerial overspray and overland runoff reach the Canadian River including the portion of the action area.

5. **Lowering Lake Levels** – Water levels at Lake Meredith have been steadily decreasing over the past decade. This has been due to many factors including lack of rainfall, groundwater pumping for local use, and the spread of salt cedar which spreads quickly and removes large amounts of water. As water resources become more scarce, the capillary effects of increased groundwater pumping may cause isolated pools present in the Canadian River in the summer (some documented to contain stranded ARSs), to dry up. As water levels drop, salinity levels rise potentially causing further stress and mortality to ARSs (NPS 2013). A decline in the number of cottonwood trees (*Populus deltoids*) in the region has also been attributed to a reduction in available water. This decline in cottonwoods bordering the Canadian River has the potential to alter ARS habitat through increased stream temperatures, loss of shading, increased erosion, and potential increased access by ORV users to the riverbanks.

V. Conclusion

After reviewing the current status of the ARS, the environmental baseline for the action area, the effects of the proposed ORV Management Plan, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to *jeopardize* the continued existence of the ARS. No critical habitat for the ARS exists in the action area, therefore none will be affected. However, implementation of the ORV Management Plan may result in the incidental take of ARS.

As stated previously, principal effects of the action may involve unintended degradation of instream habitat and possible mortality of individuals during recreation activities. The project could impact ARSs within approximately 5.5 rivermiles of habitat within Rosita Flats which is only a small fraction of available ARS habitat in the Canadian River. Implementation of the Minimization Measures associated with the proposed ORV Management Plan may reduce the level of incidental take of ARS, when compared to existing resource management practices at LMNRA.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by NPS so that they become binding conditions for any action, grant, or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. NPS has a continuing duty to regulate the activity covered by this incidental take statement. If NPS (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, NPS must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement. [50 CFR §402.14(i)(3)].

Amount or Extent of Take Anticipated

Several factors may make detection of incidental take under field conditions difficult. For example, finding a dead or impaired specimen is unlikely because the species has a small body size and is difficult to detect under most conditions. Even when detected under these conditions, capture of such individuals may be unlikely. In some instances, sublethal physiological effects may be delayed or not readily apparent in captured individuals. Despite these constraints, the Service is obligated to describe the amount or extent of such anticipated incidental take based on the amount of occupied habitat that may be disturbed.

Incidental take is expected to result from the effects of recreational activities producing erosion, sedimentation, and ORV associated contaminants being introduced into the Canadian River, and ORVs driven into water where the ARS is present. Accordingly, incidental take is expected to occur in the form of harm, wounding, and/or killing. The Service anticipates that any ARS residing within the action area (Rosita Flats) could be taken as a result of the proposed action; however, the extent of take is difficult to accurately assess due to the nature of the take and the unknown abundance of the species within the action area. Therefore, take will be determined based on the description of activities expected to affect the species as described in the Biological Assessment and using habitat area as a surrogate for the species.

The ever-changing nature of the Canadian River within Rosita Flats further complicates quantifying habitat area potentially affected. The Canadian River is typically not a single, well-defined channel, but instead is comprised of a braided system of flows when enough rainfall is present. During dryer conditions, only isolated pools remain containing water. All of these conditions may vary annually depending on rainfall. Therefore, the Service estimates take may occur within a linear distance of approximately 5.5 rivermiles from the furthest upstream boundary of Rosita Flats to the Canadian River's confluence with Chicken Creek, beyond which the ARS is no longer present. The ARS has been documented approximately 8.5 rivermiles downstream Sanford Dam but the implementation of the ORV Management Plan would not be expected to adversely affect the ARS downstream of Rosita Flats.

Effect of the take

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the ARS.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of ARS within the Action Area.

1) NPS shall develop and implement an appropriate monitoring plan for reporting progress in development of the property and implementation of the reasonable and prudent measures. Population monitoring for ARS will occur every 3-5 years, as funding permits. The content, schedule, and format of the monitoring plan will be at the discretion of the NPS, but would take place no less than once every 5 years.

2) NPS shall provide sufficient guidance to its employees and contracted employees to minimize incidental take and to ensure compliance with the Terms and Conditions in this opinion.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the Act , NPS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Parking or Staging of vehicles of any kind will be confined to areas outside the wetted channel of the Canadian River.

2. ORV use with park boundaries will be restricted to designated routes. Access to the Canadian River will be allowed only from designated access points.

3. ORV use zones will be established in Rosita Flats in two areas currently devoid of vegetation. One is south of the Canadian River and the other will be east of Bull Taco Hill. Outside these areas, ORVs would permitted only on designated, marked routes. ORVs may access the riverbed area only from marked and designated access points off the designated ORV routes.

4. A resource protection zone of approximately 1,040 acres would be established north and east of the Bull Taco Hill ORV use area to protect vegetation and reduce soil erosion. This zone would permit only vehicles with a wheel width of 64 inches or less.

5. Every two to four years, aerial photography will be used to determine if use is occurring outside of designated routes and areas.

6. Educational materials will be provided when a visitor receives an ORV use permit. These materials would include information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points. These materials could also contain the statement "The U.S. Fish and Wildlife Service recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed."

7. Four to six times per week, on-the-ground NPS law enforcement will patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV area violations. Monitoring for incidental take of ARS will occur at this time. Additional law enforcement patrols may occur as funding from ORV permits becomes available.

The Service anticipates that no more than 5.5 rivermiles of ARS habitat may be adversely affected as a result of the proposed action. These adverse effects could potentially happen annually dependent up numerous natural and human-caused elements. Reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the

action, this level of incidental take is exceeded, reinitiation of consultation will be required. NPS must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. Implementation of these measures would further help to minimize effects to the ARS. The following recommendations are provided for consideration by NPS.

The Service recommends that NPS make efforts to ensure that instream survey monitoring for ARS within Rosita Flats continue at a frequency that would continue to provide valuable information to the scientific community, but not overly stress the local population. This information could be used to direct resource management decisions at LMNRA, as well as recovery efforts for the entire ARS population. As funding is available, efforts should be made to survey areas upstream of Rosita Flats (with landowner permission) which might be more adversely impacted in the absence of resource protections. Information on habitat conditions within this area might be useful in explaining fluctuations in ARS populations downstream in Rosita Flats.

Additional educational materials concerning ARS protection might also be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of ARS conservation.

Reinitiation Notice

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The Service appreciates the cooperation extended by NPS staff and participating parties during this consultation. If further assistance or information is required, please contact Mr. Sean Edwards or myself at the above address or telephone (817) 277-1100.

cc: Regional Director, FWS, Albuquerque, NM

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Appendix A

Photos of fish stranded in pools at Rosita Flats and evidence of ORV disturbances

Isolated pool at Canadian River

Evidence of fish stranded in isolated pool at Canadian River

Evidence of fish stranded in isolated pool at Canadian River

Evidence of ORV traffic though isolated pool at Canadian River

Evidence of ORV traffic through isolated pool at Canadian River

Appendix B

Preliminary results of Dr. Gene Wilde's field experiment involving ORVs entering isolated pools containing fish

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Biological Sciences

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U.S. Fish and Wildlife Service
Oklahoma Ecological Services Field Office
9014 East 21st Street
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Dear Daniel:

We have had several discussions over the years about whether off road vehicles injure or kill fishes in the Canadian River, Texas, specifically in isolated pools in the river bed during periods of no flow. I have always believed there was a possibility that fish in pools might be affected, but didn't believe motor vehicles posed much of a hazard to fish in the flowing river. In either case, this was just an opinion.

Now, however, I have field observations and results of a quick experiment that better inform my opinion. I now believe off road vehicles, when operated in the river, do injure and kill fish. Also, I now am convinced that off road vehicles represent an important source of mortality for fishes, including Arkansas River shiner, trapped in isolated pools during periods of no flow.

In the attachment to this letter I present a few photographs and narrative that support my views.

Sincerely,

Gene R. Wilde
Professor of Fish Ecology

att.

cc: Sean Edwards
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Tire tracks on a sand bar, which give some indication of recent motor vehicle activity. Most of these tracks lead into or out of the river. Canadian River, upstream from US Hwy 287 bridge, north of Amarillo, Potter County, Texas. 31 March 2014.

Common carp captured while seining showing extensive bruising and loss of scales on rear half of the fish (right side). In all likelihood, these injuries are the resulted of the fish being run over by an off road vehicle. The fish was released alive. Canadian River, upstream from US Hwy 287 bridge, north of Amarillo, Potter County, Texas. 31 March 2014.

Recently killed plains killifish picked up from the water. (Red arrow points to a portion of the injured area of the fish.) The fish was in relatively good condition, but its body posterior to the head and gills was crushed, presumably after being run over by an off road vehicle. Canadian River, upstream from US Hwy 287 bridge, north of Amarillo, Potter County, Texas. 31 March 2014.

I have always suspected that motor vehicles driven through pools in the river bed result in fish deaths. I had an opportunity to test this hypothesis by conducting a field experiment with Aaron Urbanczyk on 2 April 2014 on the Canadian River, upstream from US Hwy 287 bridge, north of Amarillo, Potter County, Texas.

We found a small, isolated pool (10.5-m long, 1.5-m wide, 5-cm deep) approximately 3 km upstream from the US Hwy 287 bridge. We removed, by seining, a number of small (< 30 mm TL) plains killifish and plains minnow and relocated them to another pool. We then introduced 80 large (> 35 mm TL) plains killifish, two red shiner, one plains minnow, and one western mosquitofish. We drove a truck through the pool five times, at 8 km per hour (5 mph). After repeatedly seining the pool, we recovered 70 live plains killifish, plus all other fishes released into the pool.

Two dead plains killifish were collected by seining, one was crushed and other had internal injuries that were evidenced externally by hemorrhaging of the eye. Three plains killifish were displaced onto the bank by the outwash from the truck. Thus, we confirmed 5 fatalities due to the truck. We assume the five missing fish were crushed into the sand substrate. We estimate the mortality due to vehicular activity to be 11.8% (10/85 fish). A very conservative estimate would be 5.9% (5/85 fish). We observed mortality only among plains killifish. We believe this is because they represented 94% of fishes introduced into the pool, rather than being due to peculiarities of their behavior or biology.

Pool used in our experiment. (Note the pre-existing tire tracks through the pool.) Canadian River, 3 km upstream from the US Hwy 287 bridge. 2 April 2014.

Truck driven through pool at 8 km per hour. Canadian River, 3 km upstream from the US Hwy 287 bridge. 2 April 2014.

Plains killifish displaced from the pool by truck wash. The fish was still alive, but was counted as dead- it was unable to make its way back to the pool. Canadian River, 3 km upstream from the US Hwy 287 bridge. 2 April 2014.

Plains killifish crushed by the truck (above) and dead fish with internal hemorrhaging (red eye, below). Note that the severity of injuries (and body conditions) are comparable to those observed in dead fishes collected from the river (see above). Canadian River, 3 km upstream from the US Hwy 287 bridge. 2 April 2014.

These estimates must be placed in context. The experiment was conducted in a small, shallow pool- mortality in larger, deeper pools may be greater or less. The density of fish was very low compared to what we commonly see in isolated pools in the Canadian River during periods of no flow- therefore, we would expect greater mortality in natural pools. The truck was driven at a low speed. Greater speeds, more typical of off roaders, may result in a greater number of fish being displaced (splashed) from pools. Finally, these results were from a very small number (n = 5) of passes. Pools in the river bed receive much more traffic.

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