CHAPTER 1.0
PURPOSE OF AND NEED FOR THE PROJECT

The U.S. Army Corps of Engineers (Corps), Omaha District, Regulatory Division, received a permit application from the applicant, the Nebraska Department of Roads (NDOR), on September 11, 2015 requesting authorization for the placement of fill material in waters of the U.S. in connection with NDOR's proposed Nebraska Highway 12 (N-12) roadway east and west of the village of Niobrara (Niobrara), Nebraska (project). The Corps, as part of its permit review process, developed this Draft Environmental Impact Statement (EIS) in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA).[1] The Corps (the lead agency in the preparation of the EIS) and the National Park Service (NPS), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), Federal Highway Administration (FHWA), and Knox County entered into a cooperating agency agreement pursuant to 40 Code of Federal Regulations (CFR) 1501.6 on June 5, 2009, pertaining to the development and review of this Draft EIS. The Nebraska Game and Parks Commission (NGPC) and Nebraska Department of Environmental Quality (NDEQ) are participating as review agencies.

The purpose of this Draft EIS is to provide a full and fair discussion of NDOR's Applied-for Project and other reasonable alternatives to inform decision makers and the public of the environmental impacts of the Applied-for Project and the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.

This Draft EIS has been developed to provide the Corps with the information to make an informed Section 404 of the Clean Water Act (33 United States Code [USC] 1344) permit decision. The Corps decision would be provided in the form of a Record of Decision (ROD). Information presented in this Draft EIS would be used to aid in the decision required by NPS, a cooperating agency, as it relates to the National Wild and Scenic Rivers Act.

This chapter provides an overview of the project and identifies the purpose of and need for the project as required by NEPA and Section 404 of the Clean Water Act (Section 404). It also discusses a study being conducted by the Corps that includes the project area and describes the federal (and other) decisions, permits, and approvals that are necessary for the Applied-for Project.

1.1 PROJECT OVERVIEW

The following sections provide information pertaining to the project location, the Study Area, background of the project, and description of the Applied-for Project.

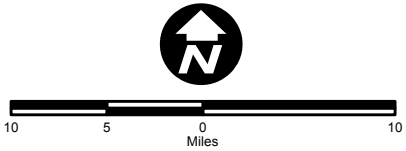
1.1.1 Project Location and Study Area

The project is located in northeastern Nebraska near Niobrara in Knox County, as shown in Figure 1-1. N-12 runs parallel to a reach of the Missouri River and is predominately located within the Missouri River floodplain both east and west of Niobrara. West of the Village of Niobrara, N-12

[1] NEPA (42 USC 4321-4347) is the foundation of environmental policy making in the U.S. The NEPA process is intended to help public officials make decisions based on an understanding of environmental consequences and take actions that protect, restore, and enhance the environment. It includes an environmental review process early in the planning for proposed actions.

crosses the Niobrara River and its floodplain, but the project would not occur in the Niobrara River and its floodplain or within Niobrara, as described below.

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Project_Vicinity_Map_Fig_1_1.mxd



Project Location Map

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

NEBRASKA 12
N-12 Niobrara East & West

DATE
October 2015

FIGURE
1-1

This page intentionally left blank

The Study Area and termini for the project are derived from locations of N-12 that experience frequent flooding and have incurred damage due to high water levels associated with the Missouri River. The two segments of N-12 that have experienced flooding are the following:

- The west segment is approximately 6.2 miles long and extends from just east of Verdel, Nebraska, on the west end to 2 miles west of the bridge over the Niobrara River.
- The east segment is approximately 6 miles long and extends from just east of Buckeye Road in Niobrara to approximately 1 mile east of Spur 54D (S-54D).

The Study Area includes potential corridors that are outside of the Missouri River floodplain that would address the purpose of the project, as discussed in Section 1.3. Figure 1-2 identifies these two segments and the Study Area for the project.

N-12 within the Study Area is an east-west two-lane highway that provides a route for local residents and through traffic. Because there are limited corridors in this area that provide for east-west vehicle traffic movement, N-12 provides a vital travel link for adjacent rural residents and for traffic traveling north-south and east-west through northeastern Nebraska.

FHWA classifies N-12 within the Study Area as a rural minor arterial (FHWA 2013). A rural minor arterial road system should, in conjunction with the principal arterial system,[2] form a rural network having the following characteristics (FHWA 2013):

1. Link cities and larger towns[3] (and other traffic generators, such as major resort areas, that are capable of attracting travel over similarly long distances) and form an integrated network providing interstate and intercounty service.
2. Be spaced at such intervals, consistent with population density, so that all developed areas of the State are within a reasonable distance of an arterial highway.
3. Provide (because of the two characteristics defined immediately above) service to corridors with trip lengths and travel density greater than those predominantly served by rural collector or local systems. Minor arterials therefore constitute routes whose design should be expected to provide for relatively high overall travel speeds, with minimum interference to-through movement.

The state of Nebraska classifies N-12 as major arterial-intermediate (NDOR 2012). Major arterials serve major statewide interests for highway transportation. These roadways link cities, towns, and other traffic generators and form a network with higher systems to provide interstate and inter-county service. Major arterials are characterized by high-speed, relatively long-distance travel patterns (NDOR 2006). Due to the differences in average daily traffic between the west and east segments, there are differences in some of the minimum design standards. Similar minimum design standards include a design speed of 65 miles per hour (mph), two 12-foot lanes, horizontal curve radius, and grade. Differences in the minimum design standards include bridge width (36 feet west segment, 40 feet east segment), shoulder width (6 feet west segment, 8 feet east segment), and clear zone (23 feet west segment, 30 feet east segment) (428 Nebraska Administrative Code et seq.).

---

[2] According to FHWA, principal arterial systems serve corridor movements for substantial or interstate travel and urban areas.

[3] "The definition of a 'large' town, in terms of population, cannot be arbitrarily determined in such a way as would fit all States. It can be determined in a given State during the classification process by building the system 'from the top down,' in terms of size of places served, and evaluating successive system increments on a diminishing returns basis, in terms of population service or traffic service" (FHWA 2013).

FHWA is not financially contributing to the construction of the project. NDOR would use minimum design standards for major arterials for its design of roadway alternatives.

1.1.2 Project Background

The project is located upstream of Gavins Point Dam; the western extent of the Study Area is approximately 42.3 miles upstream of the dam, and the eastern extent of the Study Area is approximately 20.5 miles upstream of the dam (see Figure 1-1). Gavins Point Dam is situated on the Missouri River approximately 5.3 miles west of Yankton, South Dakota, and was constructed by the Corps in the 1950s. Gavins Point Dam is the last in a series of six major flood control dams constructed in the Missouri River. The construction of Gavins Point Dam created Lewis and Clark Lake (Lake), which has resulted in a rising groundwater table (Elliot and Jacobson 2006). The project is located approximately 25 miles downstream of Fort Randall Dam. In 1973, rising groundwater levels created the need to relocate Niobrara. The relocation of Niobrara was completed in 1978. N-12, which runs parallel to a reach of the Missouri River and occurs within the Missouri River floodplain both east and west of Niobrara, has experienced flooding during periods when the Corps released flows from Fort Randall Dam (see Figure 1-1) that peaked above 50,000 cubic feet per second (cfs) [approximately the upper 20 percent chance of exceedance].

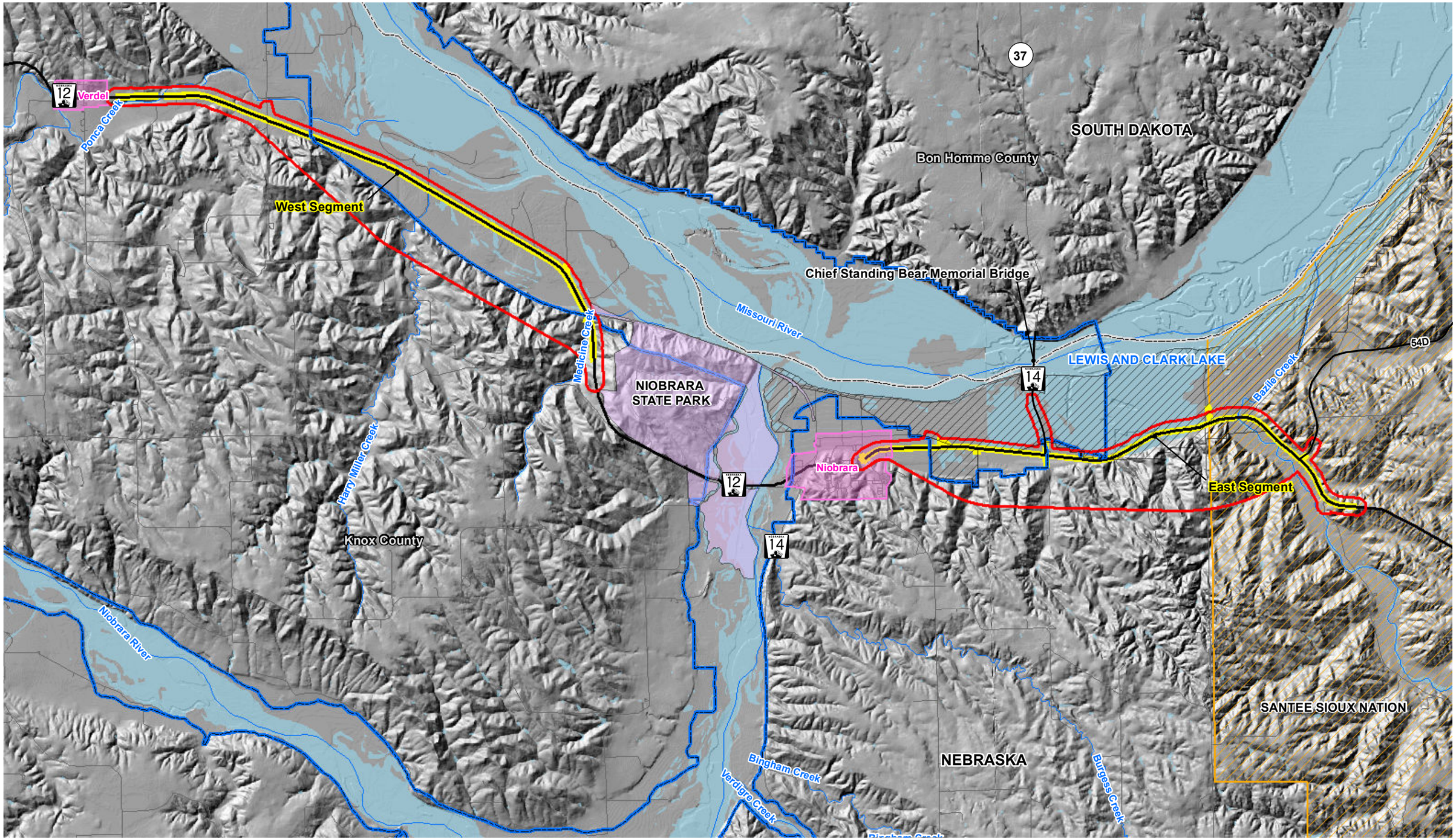
Several factors contribute to frequent flooding. Gavins Point Dam slows the current of the Missouri River and causes deposition of sediment (aggradation) as the river enters the Lake, downstream of Niobrara. In addition, as the Missouri River passes the mouth of the Niobrara River, sediment from the Niobrara River is deposited, causing greater aggradation. Aggradation has created a delta at the confluence of the Missouri and Niobrara rivers, raising the water levels of both rivers and causing flooding along N-12 (Elliot and Jacobson 2006). Finally, Fort Randall Dam is operated approximately 35.5 miles upstream of the Niobrara River, and high releases of water from the dam combined with aggradation downstream can cause flooding.

What is aggradation?
The process of raising a surface by the deposition of detritus (in the case of N-12, sediment).

What is a delta?
A triangular tract of alluvial land formed at the mouth of a river and enclosed or traversed by its diverging bodies.

In 1995, the Corps implemented interim improvements to address the flooding of N-12 in the Study Area. The elevation of the roadway was increased by several feet on three sections of N-12 to alleviate flooding problems. The first section begins 4.7 miles east of Verdel and extends east for approximately 1 mile. The second section begins approximately 1 mile east of Niobrara and extends east for approximately 0.7 mile. The third section begins 2.4 miles east of Niobrara and extends east for approximately 1 mile. Figure 1-3 shows the location of these interim improvements in the Study Area.

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Study_Area_Map_Fig_1_2.mxd



Aerial Imagery: 2006 NAIP, Knox County, Nebraska

Legend

- N-12 Segments
- Nebraska Highway 12
- Roads
- Study Area
- Waterways
- City Limits
- Counties
- Wildlife Management Areas
- Recreational River Boundary
- Santee Sioux Nation
- Niobrara State Park

1 0.5 0 1
Miles

Project Study Area

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

DATE
October 2015

FIGURE
1-2

This page intentionally left blank

These interim improvements were implemented pursuant to Section 9 of the Flood Control Act of 1946, which allows the Chief of Engineers to use any funds available for construction, operation, or maintenance of a project for the repair, relocation, restoration, or protection of a highway, railway, or utility that "has been or is being damaged or destroyed by reason of the operation of any dam or reservoir project under the control of the Department of the Army" (33 USC 701q). The resultant roadway is not consistent with NDOR design standards as it has inadequate shoulder width, steep roadway embankments, inadequate lane width, and vehicle width restrictions.

Even after these interim improvements were implemented, flooding problems persisted, and it is expected that continuing aggradation would increase the regularity and severity of these occurrences. In the spring of 1997, NDOR requested that the Corps explore a permanent solution to the N-12 flooding. NDOR's position was that the interim improvements implemented in 1995 were temporary and that further repairs, to include widening the shoulders, extending the box culverts, and flattening the side slopes, were necessary to permanently address the problem. On July 13, 1999, the Commander of the Omaha District forwarded a request to the Chief of Engineers for a finding of adverse effect and authorization to repair at a cost of $26.7 million pursuant to Section 9 of the Flood Control Act of 1946. On May 1, 2000, the Chief of Engineers issued the requested finding and authorization. However, while further repairs were authorized, they were not funded.

On March 6, 2002, NDOR filed suit in the U.S. Court of Federal Claims alleging that as a result of the operation of Gavins Point and Fort Randall dams, the water level adjacent to N-12 has been rising, undermining the highway surface, causing periodic and recurring erosion of the highway side slopes, and requiring re-grading and placement of rock riprap for bank protection. NDOR alleged that this recurring damage constitutes a taking without compensation and due process in violation of the Fifth Amendment to the United States Constitution. The relief requested by NDOR was compensation based upon the cost of a functionally equivalent substitute facility. To date, no final ruling on the case has been made because there is a need to determine the cost of implementation of a permanent solution. This Draft EIS is part of the process to determine that cost.

Beginning in 2002, NDOR has coordinated with the Corps' Regulatory Branch on potential alternatives and permitting requirements. In 2007, based on these discussions and the Corps' initial determination as to the significance of wetland impacts, association with NPS and the Missouri National Recreational River (MNRR), threatened and endangered (T&E) species present in the Study Area, factors relating to Native American tribes, and cumulative effects from other projects in or near the Study Area, the Corps determined that an EIS was needed to fully evaluate alternatives and to identify the least environmentally damaging practicable alternative (LEDPA).[4] Because authorization from the Corps under Section 404 is the major federal action, the Corps is the lead federal agency for the NEPA process.

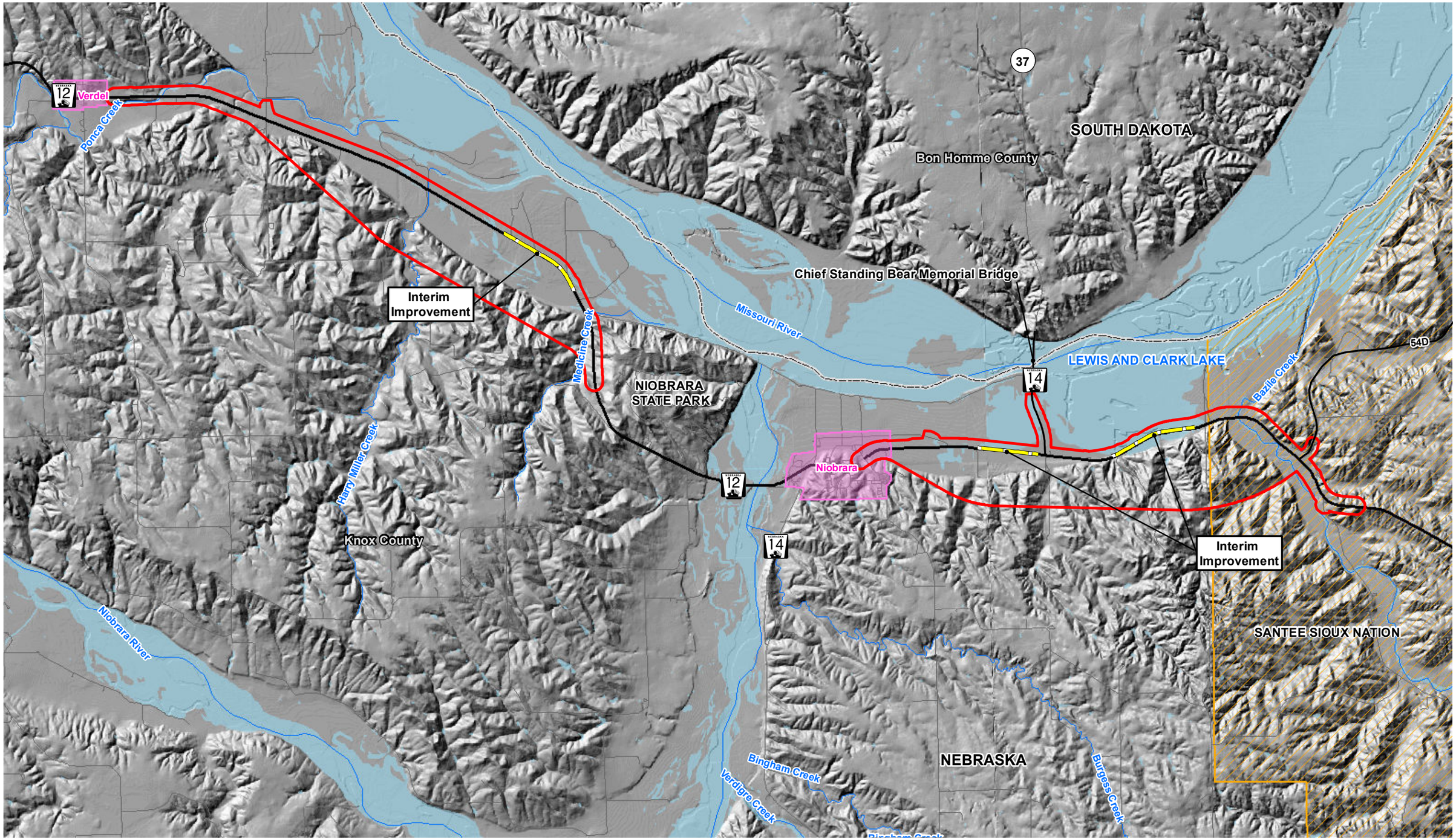
The following is a summary of significant project events, including those discussed above:

- 1995 – Corps installs interim improvements on N-12
- 1997 – NDOR requests that the Corps explore a permanent solution
- 1999 – Corps Omaha District requests funding for permanent repair costs
- 2002 – NDOR files suit against Corps in U.S. Court of Federal Claims
- 2004 – NDOR holds agency and public meetings on preliminary alternatives

[4] A Notice of Intent was filed in July 28, 2008, in the Federal Register (FR) (Volume 73, Number 144).

- 2004–2006 – NDOR conducts studies, evaluates impacts, and develops its preferred alternative
- 2006 – NDOR holds a highway design public hearing about its preferred alternative
- 2006–2007 – NDOR and Corps coordinate on Section 404 permit
- 2007 – Corps becomes lead federal agency and determines that an EIS is needed
- 2008 – Corps initiates the EIS process
- 2011 – Missouri River flooding (see Section 1.4.1)
- 2012–2014 – Corps creates a new Missouri River Hydraulic Model that requires the roadway grade to be raised an additional 7 to 10 feet
- 2014–2015 – NDOR redesigns all alternatives to meet the new model requirements, added a Nebraska Highway 14 (N-14) tie-in, incorporated additional bridge design criteria, and updated alternative costs

Z:\Projects\NDOR\84534_N12_EIS\map_docs\mxd\Final\EIS_Figures\Interim_Improvements_Fig_1_3.mxd



Aerial Imagery: 2006 NAIP, Knox County, Nebraska

Legend

- Interim Improvements
- Nebraska Highway 12
- Roads
- Study Area
- Waterways
- City Limits
- Counties
- Recreational River Boundary
- Santee Sioux Nation

1 0.5 0 1
Miles

Interim Improvements

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

DATE
October 2015

FIGURE
1-3

This page intentionally left blank

1.2 SUMMARY OF NDOR'S APPLIED-FOR PROJECT

The Applied-for Project is the alternative for which NDOR has submitted an application for a Corps Section 404 (33 USC 1344) permit. NDOR has submitted an application to relocate the eastern and western floodplain segments of N-12 to locations south of their existing locations. The segment of N-12 that is in the bluffs, including the segment that goes through Niobrara, will remain the same. The new roadway segments will have a higher elevation and enhanced bridged sections (referred to as Alternative A7 – Base of Bluffs Elevated Alignment [see Chapter 2.0, Section 2.5.3]). The west segment is approximately 6.2 miles long and extends from just east of Verdel on the west end to 2 miles west of the bridge over the Niobrara River. The east segment is approximately 6 miles long and extends from just east of Buckeye Road in Niobrara to approximately 1 mile east of S-54D. A new connection to the Chief Standing Bear Memorial Bridge (N-14) and South Dakota Highway 37 (SD-37) would be developed. Once the roads are completed, the existing N-12 roadway would be removed to the existing ground level.

1.3 PURPOSE OF THE PROJECT

The Corps outlines two types of purposes of a project, the basic project purpose and the overall project purpose. The Corps uses the basic project purpose to determine whether a project is compliant with Section 404 (see Section 1.3.1). The Corps uses the overall project purpose to summarize the problem(s) or issue(s) that the proposed action and other alternatives would need to solve to be considered reasonable and practicable (see Section 1.3.2).

1.3.1 Basic Project Purpose

The basic project purpose is to rehabilitate the N-12 roadway in the Study Area. This project is not water-dependent because rehabilitation of a roadway does not need to be located in a special aquatic site to fulfill its purpose; therefore, alternatives that do not involve special aquatic sites are presumed to be available (40 CFR 230.10(a)(3)).

1.3.2 Overall Project Purpose

The overall project purpose is to provide a reliable transportation link on N-12 between Verdel, Niobrara, and S-54D that eliminates existing roadway deficiencies caused by operations of Fort Randall and Gavins Point dams and that safely accommodates current and projected traffic levels while maintaining regional connectivity. Specifically, the roadway must maintain reliable connectivity for regional traffic using N-14 and the intersecting county road system and accessing Niobrara. This project purpose would be used to evaluate the full range of alternatives under Section 404(b)(1) guidelines and NEPA (see Chapter 2.0).

1.4 NEED FOR THE PROJECT

The need for the project is driven by flooding associated with the Missouri River and the Lake, which has resulted in an unreliable roadway, safety concerns, and an interruption in regional connectivity. As discussed in Section 1.1.2, Project Background, Gavins Point Dam on the Missouri River near Yankton was built in the 1950s, creating the Lake. Gavins Point Dam slows the current of the Missouri River and causes aggradation as the river enters the Lake, downstream of Niobrara. In addition, as the Missouri River passes the mouth of the Niobrara River, sediment from the Niobrara River is deposited, causing greater aggradation. This has caused the Missouri River bed to rise, and subsequently, surface water levels in the area have risen. N-12, which runs parallel to the Missouri River, is affected where it crosses into the Missouri River floodplain east and west of Niobrara. Approximately 8 miles of N-12 run through the floodplain; approximately half of this length is

located to the east and half is located to the west of Niobrara. The distance between N-12 and the Missouri River bank differs, but some areas are as close as 2,000 to 3,000 feet. Due to the location of N-12, roadway overtopping and prolonged high water levels are common. In response to the flooding and high water levels, the Corps implemented interim improvements that have created roadway design deficiencies and an unreliable roadway. The conditions that constitute the Project need are described below.

1.4.1 Reliable Roadway

Reliability of N-12 in the Study Area is currently affected by flooding and roadway issues that are associated with flooding. Overtopping of the roadway in some areas, such as the Bazile Creek area, is a yearly occurrence. Bazile Creek intersects N-12 and enters the Missouri River east of Niobrara (see Figure 1-2). Other areas, such as the Ponca Creek area, are overtopped on a routine, but less frequent, basis. Ponca Creek intersects N-12 and enters the Missouri River west of Niobrara. Conditions that contribute to roadway flooding in the Study Area include sedimentation and releases of water from the Missouri River Mainstem System (Mainstem System), as described below. Due to high water levels and overtopping of N-12 in the Study Area, frequent roadway maintenance is necessary and has contributed to the existing roadway not meeting current design standards.

Conditions Contributing to Flooding

Sedimentation

The sediment load coming into the Lake from the Missouri River and its tributaries (primarily the Niobrara River and Bazile Creek) has caused aggradation in the Lake. The confluence of the Niobrara River and the Missouri River is just west of Niobrara (see Figure 1-2). The waters slow and sediment is deposited, creating a fill area that restricts the channel and raises the bed of both rivers. This is causing the Lake to decrease in dimension and storage volume. The water surface elevations above the Lake have been raised. Sedimentation has also reduced the size (and therefore capacity) of bridge openings (that is, the volume of water able to pass under a bridge).

The Corps estimates from hydrologic surveys that between 2,400 and 2,600 acre-feet[5] of sediment per year is deposited into the Lake below the 1,210-foot elevation, which is the maximum pool of the reservoir (Corps 1970, 2011a). Sediment entering the Lake is generated from the Missouri River upstream of Ponca Creek, Bazile Creek, Choteau Creek, and Emanuel Creek (Corps 2011a). However, the Niobrara River is the major source of sediment supply. On average, 60 percent (1,560 acre-feet) of the sediment is from the Niobrara River (Elliott and Jacobson 2006). Future rates are not predicted to change significantly (Corps 2009a).

Missouri River Mainstem System Releases

Fort Randall and Gavins Point dams are part of the Mainstem System, which consists of six major dams and reservoirs in Montana, North Dakota, South Dakota, and Nebraska. The Mainstem System can store 72.4 million acre-feet (MAF) of water, making it the largest reservoir system in North America. The Mainstem System is regulated by the Corps using guidelines published in the *Missouri River Mainstem Reservoir System Master Water Control Manual* (Master Manual) (Corps 2006) to serve the congressionally authorized project purposes of flood control, navigation, irrigation, hydropower generation, water supply, water quality control, recreation, and fish and wildlife (including T&E species). System regulation is in many ways a repetitive annual cycle. Most of the

[5] An acre-foot is the volume of 1 acre of surface area to a depth of 1 foot.

year's water supply is produced by runoff from winter snows and spring and summer rains that increase System storage. After reaching a peak, usually during July, System storage declines until late in the winter when the cycle begins anew. In years with excess inflows and storage, releases are set to meet evacuation of flood control storage prior to the next year's runoff season. Normal and conservation regulation involves a check on the amount of water in System storage on March 15 to determine if a navigation season would be provided that year, and if so, the service level to provide for the first part of the navigation season. Downstream target flows at four designated locations are used to guide System releases from Gavins Point Dam, the furthest downstream of the six projects. The System storage is checked again on July 1 to determine the service level for the remainder of the navigation season and the ending date or length of the navigation season (which normally runs from April through November). Finally, the System storage is checked on September 1 to determine the System winter release rate.

In the Study Area, the flows are influenced by Fort Randall Dam near Pickstown, South Dakota, approximately 35.5 miles upstream from Niobrara. From 1966 to 2014,[6] the yearly flows released from Fort Randall Dam averaged 25,100 cfs. This flow value is exceeded about 45 percent of the time.

Releases from Fort Randall Dam to support a full navigation season typically start around March 22 and go to November 22 to support the official April 1 – November 30 navigation season. In general, the probability for flooding during this time period is higher than during the non-navigation season. The average release from Fort Randall Dam during the navigation season is 30,000 cfs, with a historic range of approximately 0 to 160,000 cfs. During that period, flows exceed the average flow approximately 40 percent of the time.

What is a cubic foot per second?

One cubic foot per second (cfs) equates to 7.48 gallons per second. Cfs is a common unit used to measure discharge. The rate of flow of a creek, river, or flood is measured by quantity over time. This is often referred to as discharge, or the rate at which a volume of water passes a given point in a given amount of time.

Flooding of N-12 occurs when the Corps is required to release high flows from Fort Randall Dam during the navigation season due to higher than normal runoff into the Mainstem System. The following are periods for which the Corps released flows that peaked above 50,000 cfs (approximately the upper 20 percent of the range of flows) for which flooding of N-12 was known to occur:

- May 15 to December 3, 1975 (peaking at 60,600 cfs)
- May 26 to December 4, 1978 (peaking at 53,200 cfs)
- June 17 to December 4, 1995 (peaking at 53,000 cfs)
- March 23 to December 4, 1996 (peaking at 53,000 cfs)
- March 27 to September 30, 1997 (peaking at 64,300 cfs)
- May 7 to September 29, 2011 (peaking at 160,000 cfs)

When similar releases occur in the future, flooding of N-12 would likely be worse than what occurred in 1975, 1978, 1995, 1996, 1997, or 2011. This is due to the ongoing aggradation that has occurred in the vicinity of the Project. Between 1978 and 2003, the delta of the Lake has grown longitudinally 3.1 miles. Since 1993, the delta has grown longitudinally an average of 0.65 mile per decade (Elliot

[6] The data set includes data from October 1, 1966, to December 31, 2014

and Jacobson 2006). This sedimentation has reduced the ability of the Missouri River to carry high flows, resulting in higher water levels for a given release compared to 10 to 30 years ago.

Flood of 2011

Prolonged heavy rain coupled with melting snowpack caused historic reservoir releases and flooding along the Missouri River and its tributaries in Montana, North Dakota, South Dakota, Nebraska, Iowa, Kansas, and Missouri in 2011. Mountain snowpack, which typically peaks around April 15, continued to accumulate until early May. On May 1, the Corps projected summer releases of 57,500 cfs from Gavins Point Dam and was on schedule to evacuate the runoff from record snowpack. However, during a 2-week span in May, the eastern half of Montana received between 300 and 400 percent of normal rainfall. Portions of North Dakota, South Dakota, and Wyoming received more than 200 percent of normal rainfall. Heavy rain continued into June with portions of Montana, Wyoming, and South Dakota receiving more than 200 percent of normal rainfall.

Since 1898, when the Corps began keeping detailed records of runoff into the Missouri River Basin above Sioux City, Iowa, the total monthly runoff during May, June, and July 2011 was the highest on record, with 9.2 MAF, 14.8 MAF, and 10.2 MAF, respectively. The combined runoff for June and July totaled 25.0 MAF, just below the normal total annual runoff of 25.2 MAF (Missouri River Basin Water Management). March through July runoff reached a record amount of 48.4 MAF. Runoff for the calendar year was estimated at 61.0 MAF. The previous annual record of 49.0 MAF occurred in 1997 (Missouri River Basin Water Management).

The Fort Randall Dam released flows above 60,000 cfs starting on May 23, 2011, and this continued until September 2011, peaking at 160,000 cfs on July 26 (Corps 2011b, 2015a). The previous record flow out of Fort Randall Dam was 67,000 cfs in 1997 (Corps 2015a).

High water levels associated with historic flooding cause closure of both the west and east segments of N-12 being evaluated in this Draft EIS. The west segment from Niobrara State Park to Verdel was closed June 4, 2011, and reopened September 8, 2011. The east segment from Niobrara to S-54D, including the Chief Standing Bear Memorial Bridge, was closed June 7, 2011, and reopened August 25, 2011.

Frequent Roadway Maintenance

In addition to the interim improvements that were implemented in 1995, roadway maintenance has occurred since 1995 to repair roadway damage due to high water levels and/or flooding. Until a permanent solution is implemented, frequent roadway maintenance would be required to repair damage caused by high water levels and/or flooding of the roadway. Between 2005 and 2010, 22 NDOR maintenance events have occurred on N-12 in the Study Area, requiring 2,946 total hours (an average of 133.9 hours per event) as shown in Table 1-1. The crew card data taken during the flood of 2011 was not included in this analysis because it was an abnormal event.

Table 1-1
NDOR Repairs to N-12, 2005 to 2010

Start Date	Total Crew Hours Worked	Total Days Worked
May 30, 2005	45	1
June 21, 2005	119	2
July 1, 2005	8	1
June 16, 2006	9	1
June 17, 2006	4	1
June 21, 2006	32	1
February 21, 2007	197	3
March 6, 2007	11	1
March 9, 2007	520	9
February 29, 2008	348	5
March 10, 2008	40	1
March 12, 2008	64	3
March 18, 2008	16	1
March 20, 2008	50	2
May 29, 2008	720	3
June 2, 2008	67	1
June 4, 2008	60	1
June 6, 2008	8	1
July 7, 2008	36	1
June 24, 2010	141	1
July 22, 2010	337	2
September 23, 2010	114	2
Total	**2,946**	**88**
Average per event:	**133.9**	**4**

Sources:
NDOR. 2008a. Integrated Highway Inventory, Nebraska Department of Roads Crew Card Query. July 7.
NDOR. 2014a. Integrated Highway Inventory. Nebraska Department of Roads Crew Card Query. August 27.

Since 2004, the cost to maintain N-12 in the Study Area has averaged $10,462 per mile. Roadways of equal statewide classification and comparable traffic volumes have averaged $4,451 per mile. See Table 1-2 for yearly average maintenance costs for N-12 and comparable highways.

Table 1-2
Yearly Average Maintenance Costs

Year	N-12 ($ per mile)	Comparable Highways[1] ($ per mile)
2004	977	1,425
2005	7,573	2,461
2006	3,246	3,651
2007	7,133	2,830
2008	22,009	1,788
2009	5,255	7,949
2010	9,779	7,003
2011	14,262	3,001
2012	6,369	7,807
2013	21,402	4,458
2014	17,077	6,588
2004-2014 Average	**10,462**	**4,451**

Note:
[1] *NDOR selected portions of Nebraska Highway 9 (N-9) and Nebraska Highway 57 (N-57) to compare to N-12. These highways have equal state classifications and similar traffic volumes to N-12.*

Sources:
NDOR. 2009a. Email message from Don Turek, Assistant Design Engineer, NDOR, to Matt Pillard, HDR, regarding yearly maintenance costs of existing N-12 & two other nearby highways with same functional classification. January 12.
NDOR. 2014b. Email message from Andrew Mansfield, Engineer II, NDOR, to Matt Pillard HDR, regarding yearly maintenance costs of existing N-12. September 23.

Due to the expected increase in surface water elevations and flooding, the subsequent need for maintenance is not likely to decrease in the future.

1.4.2 Safely Accommodate Traffic

The need to safely accommodate traffic stems from the existing roadway design deficiencies and driver hazards during flooding events.

Existing Roadway Design Deficiencies

To determine roadway design deficiencies, traffic volume trends and existing level of service (LOS) are typically analyzed.

Based on traffic counts (where available), empirically derived data, and national and local averages, NDOR determined an average number of vehicles per day (vpd), referred to as Average Daily Traffic (ADT), that traveled on the west and east segments of N-12 and on N-14 in 2014 and an expected ADT for 2018 and 2038,[7] as shown in Table 1-3. The west and east segments of N-12 are shown in Figure 1-2.

[7] NDOR's minimum design standards state that the “design year” traffic for new and reconstructed projects on the state highway system shall be the year of initial construction plus 20 years. At the time of this analysis, the anticipated construction year was 2018. Therefore, the design year is 2038.

Table 1-3
N-12 and N-14 Traffic Volume Trends

Segment	2014 (vpd)[1]	2018 (vpd)[1]	2038 (vpd)[1]	Percentage of Change 2014 – 2038	Average Annual Percent Increase 2014–2038
N-12 West Segment (Mile Post 151.48–158.03)	560	580	765	36.6%	2.6%
N-12 East Segment (Mile Post 161.53–167.72)	1,480	1,585	2,140	44.6%	3.2%
N-14 (Mile Post 202.30–203.30)	1,530	1,710	2,650	73.2%	5.2%

Note:
[1] *vpd = vehicles per day*
Source:
NDOR. 2014c. Email message from Andrew Mansfield, Engineer II, NDOR, to Matt Pillard, HDR. August 28.

The quality of traffic operations for a given roadway, section, or intersection is typically identified using LOS. LOS is a standard way of measuring how well or poorly traffic flows on a roadway. LOS categories range from LOS A (best) to LOS F (worst). LOS is based on the amount of delay experienced by motorists, speed and travel time, freedom to maneuver (density), and safety. The current and design year (2038) LOS for N-12 in the Study Area is LOS A.

Existing or future capacity and associated LOS conditions would not result in existing design deficiencies of N-12. Instead, the interim improvements implemented in 1995 by NDOR in response to the continuing high water levels and overtopping of N-12 in the Study Area have created deficiencies and diminished the safety of the roadway.

The Corps constructed interim improvements in 1995, including raising the elevation of N-12 in three short sections (one west of Niobrara and two east of Niobrara) to alleviate the flooding problem and installing cable guardrail for vehicle safety in the event that a car should leave the roadway. The resulting roadway conditions do not meet NDOR design standards (see Section 1.1.1) and create hazards for the traveling public.[8] Design deficiencies resulting from these interim improvements are as follows:

- Inadequate shoulder width – The shoulder width from the edge of the driving lane to the cable guard rail in the areas where interim improvements were implemented east of Niobrara is 4 feet and west of Niobrara is 3 feet. Standard shoulder width for this type of roadway is 8 feet east of Niobrara and 6 feet west of Niobrara.
- Steep roadway embankments – The interim improvements created steeper than normal foreslopes of the roadway embankment. These steeper than normal foreslopes are mostly 2.5:1, which means, for every 2.5 feet of horizontal distance there is a 1-foot drop in elevation on the foreslope of the embankment (2.5H:1V). The minimum normal foreslope is 3H:1V. Except for these interim improvement sections, the existing foreslopes on both the west and east segments are generally 4H:1V.

[8] Exceptions to design standards can be allowed occasionally to minimize project impacts on resources or to minimize right-of-way (ROW) impacts when unique circumstances justify a deviation.

- Inadequate lane width – The pavement width from Niobrara east to S-54D is 22 feet wide, allowing 11-foot-wide lanes, not including the shoulder pavement. The minimum standard lane width on this highway is 12 feet.
- Vehicle width restrictions – Due to narrow lanes, a vehicle width restriction of 9 feet is in effect indefinitely for the portion of N-12 starting 0.3 mile east of Verdel and extending to S-54D. An escort vehicle is required for wider widths (NDOR 2008b).

An analysis of NDOR accident records[9] shows that the west segment of N-12 and the N-14 segment both have higher crash rates than the statewide average for similar roadway types (see Table 1-4). The east segment of N-12 has an accident rate lower than the statewide average, but most accidents on this segment occur in a sub-segment between Central Avenue in Niobrara and N-14. This sub-segment has an average accident rate of 1.147 accidents per million vehicle miles (mvm), which is higher than the statewide average accident rate. These results indicate that accidents within the Study Area do occur with higher frequency in comparison to similar facilities outside of the Study Area.

Table 1-4
Accident Rate Comparison

Facility	Accident Rate (accidents/mvm[1])	Statewide Accident Rate (accidents/mvm[1])
N-12 West Segment	1.743	0.787
N-12 East Segment	0.715[2]	0.787
N-14 Segment	2.451	0.787

Notes:
[1] *mvm = million vehicle miles*
[2] *A sub-segment of the east segment between Central Avenue in Niobrara and N-14 has an accident rate of 1.147 accidents/mvm, well above the statewide accident rate.*
Source:
NDOR. 2014c. Email message from Andrew Mansfield, Engineer II, NDOR, to Matt Pillard, HDR. August 28.

These crashes could be attributed to roadway deficiencies. For example, several crashes involved guard rails. Guard rails are typically used to protect the motorists from other more threatening hazards. However, guard rails are a hazard that can increase the severity of crashes and reduce the roadway area that a driver has to recover from quick driving movements. In addition, animals were noted as a cause for some crashes. Due to the rural nature of N-12 in the Study Area, the presence of wildlife (such as white-tail deer, raccoons, and waterfowl) is common. The narrow roadway and presence of guard rails do reduce the area available for evasive driving actions should wildlife enter the roadway.

Driver Hazards during Flooding Events

In the Study Area, N-12 is exposed to flooding. Roadway flooding is a concern for driver safety because motorists may choose to drive through flooded roadways even if the road is marked closed. N-12 in this location does not have lighting, and the inherent dangers of driving through flooded roadways exist, especially during times of poor visibility.

[9] The analysis of the accident records included a period from July 1, 2011, to June 30, 2014.

In 1995, the Corps implemented interim measures to address the problem, raising the elevation of N-12 by several feet on three short sections to alleviate the flooding problems as discussed in Section 1.1.2, Project Background). However, the resultant roadway is not consistent with NDOR design standards, as described above.

1.4.3 Regional Connectivity

N-12 in the Study Area supports a regional traffic base. Based on NDOR's analysis of 2006 ADT data, in general, the traveling public that uses N-12 in the Study Area is predominantly traveling in a north-south direction, thereby using N-12 to travel north on N-14 over Chief Standing Bear Memorial Bridge to SD-37 and to destinations north or to travel south on N-14. This indicates that N-12 in the Study Area serves a regional transportation need. It is a link in a transportation system that serves the traveling public outside of the Study Area.

Smaller portions of the traveling public are using N-12 to reach destinations such as Niobrara, Niobrara State Park, and S-54D. The county road system is used to access other regional destinations, such as Center, Nebraska (the Knox County seat), and the Ohiya Casino and Resort (owned and operated by the Santee Sioux Nation).

1.5 RELATED STUDY

The Corps is conducting a Lewis and Clark Lake Sediment Management Study (Study), an engineering viability study that examines the possibilities for moving sediment in the Lake delta by mechanically controlling water levels and flows. Previous studies have examined ways to restore the sediment balance and have suggested flushing sediment, dredging, re-routing tributaries, and removing the dam. The Study is being conducted in several phases; currently, Study team members are gathering data and conducting analyses. The Study is being funded through the Missouri River Recovery Program (www.moriverrecovery.org), a partnership between the Corps and USFWS.

1.6 FEDERAL AND OTHER DECISIONS, PERMITS, AND APPROVALS

A number of decisions, permits, and approvals are needed from federal agencies to implement the Proposed Action. These decisions, permits, and approvals are listed along with their status in Table 1-5 and are discussed below.

Table 1-5
Status of Decisions, Permits, and Approvals[1]

Action	Agency	Status
EIS	Corps	Initiated with Notice of Intent on July 25, 2008.
Record of Decision (Section 404 Permit Decision, Clean Water Act)	Corps	Would be developed after the Final EIS has been circulated.
Tribal 401 Water Quality Certification	EPA	Evaluated at the time of Permit Decision.
State 401 Water Quality Certification	NDEQ	Evaluated at the time of Permit Decision.
NPDES Construction Storm Water General Permit	NDEQ	Obtained at least 7 days in advance of land grading.
Section 7(a) Evaluation, Wild and Scenic Rivers Act	NPS	Initiated in accordance with cooperating agency meeting.
Section 6(f) Resources, Land and Water Conservation Fund Act	NPS, NGPC	Initiated during alternatives screening.
Section 7 Consultation, Endangered Species Act	USFWS	Initiated in accordance with cooperating agency meeting.
Nebraska NESCA	NGPC	Initiated in accordance with cooperating agency meeting.
Section 106 Compliance, National Historic Preservation Act	SHPO, THPO	Initiated during alternatives screening.
Knox County Resolution	Knox County	Actual decision has not yet been identified.
Knox County Floodplain Development Permit	Knox County	Obtain prior to project letting.

Note:
[1] *Status is at time of this draft.*
EIS = Environmental Impact Statement
NPDES = National Pollutant discharge Elimination System
Corps = U.S. Army Corps of Engineers
NESCA = Nongame and Endangered Species Conservation Act
EPA = U.S. Environmental Protection Agency
NDEQ = Nebraska Department of Environmental Quality
NPS = National Park Service
NGPC = Nebraska Game and Parks Commission
USFWS = U.S. Fish and Wildlife Service
SHPO = State Historic Preservation Office
THPO = Tribal Historic Preservation Office

1.6.1 Corps Decision

As the lead federal agency, the Corps is responsible for preparation of the EIS and the ROD. This Draft EIS has been developed to provide the Corps with the information to make an informed Section 404 (33 USC 1344) permit decision. The Corps would have to determine if NDOR's Applied-for Project complies with Section 404, which entails the Corps making two findings: 1) Does the Applied-for Project comply with Section 404(b)(1) guidelines?; and 2) Is the Applied-for Project contrary to the public interest? To comply with Section 404(b)(1) guidelines (40 CFR 230.10):

- The Applied-for Project must be the LEDPA to the aquatic ecosystem without having other significant environmental effects.
- The Applied-for Project would not cause or contribute to the violation of applicable state or federal laws, such as water quality standards, the Endangered Species Act, or the National Wild and Scenic River Act.

- The Applied-for Project would not result in significant degradation of waters of the U.S.
- All appropriate and practicable steps have been taken to minimize the adverse impacts of the Applied-for Project on wetlands and other waters.

The Corps' public interest review requires the careful weighing of all public interest factors relevant to each particular permit application. Public interest factors include socioeconomic resources, natural resources, aesthetics, safety, considerations of property ownership, and the needs and welfare of the people.

After careful evaluation of the Applied-for Project (and the reasonable alternatives identified that would avoid impacts on waters of the U.S.), the Corps would decide whether to issue a permit under Section 404 for the Applied-for Project. The options for the Corps' decision are: 1) approve the permit as submitted; 2) deny the permit; or 3) approve the permit with modifications and/or conditions.

The Corps, through its operation of the Mainstem System, has been determined to be responsible for the problems associated with N-12 in this region (see Section 1.1.2, Project Background). Therefore, the regulatory decision would be coordinated among offices within the Omaha District, the Missouri River Regional Office, and the Department of Justice.

1.6.2 Tribal and State 401 Water Quality Certification

EPA is a cooperating agency and is responsible for Tribal 401 water quality certification for the Proposed Action. NDEQ is responsible for administering the state's 401 Water Quality Certification Program and is responsible for 401 certification on non-tribal lands.

1.6.3 National Pollutant Discharge Elimination System Construction Storm Water

A National Pollutant Discharge Elimination System (NPDES) stormwater construction permit is required from NDEQ prior to grading activities more than 1.0 acre in size. The NPDES stormwater construction permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP) that includes establishment of best management practices (BMPs) for managing construction related stormwater runoff.

1.6.4 Section 7(a) Evaluation

NPS is a cooperating agency and is responsible for administering Section 7(a) of the Wild and Scenic Rivers Act (16 USC 1271-1287, Public Law 90-542). Portions of this project are in the MNRR and near the Lewis and Clark National Historic Trail (National Historic Trails Act of 1978, as amended). A Section 7 (a) of the Wild and Scenic Rivers Act determination issued by NPS of no direct and adverse affect to the outstandingly remarkable values (cultural, ecological, fish and wildlife, geological, recreational, and scenic) attributed to the MNRR is required before a selected alternative and proposed project can proceed to full permitting and implementation.

1.6.5 Section 6(f) Resources

Section 6(f) of the Land and Water Conservation Fund Act of 1965 (16 USC 4601-4 through 4601-11, Public Law 88-578) was enacted to help preserve, develop, and assure access to outdoor recreation facilities to strengthen the health of U.S. citizens. It created the Land and Water Conservation Fund, also known as LAWCON funds. LAWCON funds are the principal source of monies for land acquisition for outdoor recreation by four federal agencies: NPS, Bureau of Land Management, USFWS, and the U.S. Forest Service (Hardy Vincent 2006).

A stipulation in the Section 6(f) of the Land and Water Conservation Fund Act of 1965 legislation requires that properties purchased using LAWCON funds (Section 6(f) properties) are inventoried, described, and depicted in project-related construction. No lands or recreation facilities that have been paid for in part or in entirety by LAWCON funds can be converted to non-park or non-recreation uses without the approval of NPS. This approval would be granted only if the action is in compliance with the state comprehensive outdoor recreation plan and an area of equal fair market value and usefulness is substituted for the land being impacted. Public lands or public facilities developed with federal land and water conservation funds (Section 6(f) properties) exist within the Study Area. See Chapter 3.0 for a discussion of these properties and the anticipated impacts on them.

1.6.6 Section 7 of the Endangered Species Act Consultation

USFWS is a cooperating agency and is responsible for administering the Endangered Species Act of 1973 (ESA), the Fish and Wildlife Coordination Act (FWCA), Bald and Golden Eagle Protection Act (BGEPA), and the Migratory Bird Treaty Act (MBTA). The ESA provides for the conservation of federally T&E species and the ecosystems upon which they depend. Under Section 7(a)(2) of the ESA, the Corps is required to consult with USFWS to ensure that any federal action is not likely to jeopardize the continued existence of any T&E species, or adversely modify critical habitat designated for those species if a proposed federal project may affect a federally listed species. In addition to coordination with USFWS, FWCA requires consultation with NGPC.

1.6.7 Nebraska Nongame and Endangered Species Conservation Act

NGPC assists in the protection of nongame species and species of wildlife and plants that are determined to be threatened or endangered elsewhere pursuant to the ESA under the Nebraska Nongame and Endangered Species Conservation Act (NESCA).

1.6.8 Section 106 Compliance

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to determine whether their undertakings would have adverse impacts on historic properties and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The term historic property is defined in NHPA as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register,” including artifacts, records, and remains that are related to such district, site, building, structure, or object (16 USC 470w(5)). This includes traditional cultural properties.

Depending on the timing of the identification of historic properties and a finding of affect for the proposed undertaking, one of two options is available to the Corps and other pertinent parties, as follows:

1. Programmatic Agreement – A programmatic agreement outlines the process for identification, evaluation, and mitigation of adverse effects on historic properties.
2. Memorandum of Agreement – A memorandum of agreement outlines the agreed-upon measures that the agency would follow to avoid, minimize, or mitigate the adverse effects of historic properties that were identified for the federal undertaking.

The Corps would coordinate Section 106 of the NHPA activities with the Nebraska State Historic Preservation Office (SHPO), appropriate Tribal Historic Preservation Offices (THPOs), and others, which may include Native American tribes, local governments, and members of the public.

1.6.9 Tribal Consultation

The Corps is required to consult with tribes on a nation-to-nation basis on issues of tribal interest. Those issues may include Section 106 of the NHPA elements as described in Section 1.6.8, as well as other issues, such as economic and environmental issues.

1.6.10 County Approvals

Knox County is a cooperating agency and is responsible for review and input on effects of the project on the existing county road system. Knox County may be required to pass a resolution that accepts the Proposed Action and alterations of county road systems. Knox County may require a floodplain development permit.

1.6.11 Section 4(f) Resources

Under the U.S. Department of Transportation (USDOT) Act of 1966 (49 USC 303, 23 USC 138), Section 4(f) legislation provides protection for publicly owned parks; recreation areas; historic sites (regardless of ownership), including bridges, highways, and railroads; archaeological resources; wildlife and/or waterfowl refuges; and bikeways or trails from conversion to a transportation use.

On highway projects that use USDOT funds, Section 4(f) properties must be identified and the use of such properties indicated. A Section 4(f) evaluation is essentially a process of analysis to avoid, minimize, and mitigate impacts on identified Section 4(f) resources. While there are potentially several agencies that are involved in Section 4(f) determinations for highway projects, it is ultimately FHWA that is responsible for final, formal Section 4(f) decisions and determinations.

USDOT funds are not being used for the project, so Section 4(f) evaluation does not apply in this case. There will be no further Section 4(f) analysis in this Draft EIS.

This page intentionally left blank