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October 24, 2008

Dr. Roy E. Crabtree
Regional Administrator
Southeast Regional Office
National Oceanic and Atmospheric Administration
263 13th Avenue South
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Subject: EPA NEPA Comments on NOAA PDEIS for the "Fishery Management Plan for Regulating Offshore Marine Aquaculture in the Gulf of Mexico"; Gulf of Mexico Fishery Management Council; Gulf of Mexico EEZ; CEQ No. 20080350; ERP No. NOA-E91026-00

Dear Dr. Crabtree:

Consistent with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has reviewed the National Oceanic and Atmospheric Administration's (NOAA) Programmatic Draft Impact Statement (PDEIS) for the referenced Fishery Management Plan (FMP) for offshore marine aquaculture (aka: mariculture). The PDEIS was prepared for NOAA (NOAA Fisheries Service) by the Gulf of Mexico Fishery Management Council (Council). In the PDEIS, the Council has made several recommendations to NOAA on preferred alternatives and other issues for NOAA's finalization in their pending Programmatic Final EIS (PFEIS).

A FMP is required to regulate offshore marine aquaculture since aquaculture is considered a form of "fishing" under the Magnuson Stevens Fishery Conservation Management Act (MSA). As a major federal action, NEPA documentation is required for the FMP. The current PDEIS/FMP provides regional regulations for promoting and managing prospective marine aquaculture that is environmentally sound and economically sustainable in the federal waters of the Gulf of Mexico Exclusive Economic Zone (Gulf EEZ), located 3-200 miles offshore. Approximately 13.7% of the Gulf EEZ is considered suitable for aquaculture (pg. 53). Existing regulations for marine offshore aquaculture only provide for a short-termed Exempted Fishing Permit (EFP) that is not intended for commercial fish production. Based on the PDEIS (pg. 1), it is expected that 5-20 investors would request permits over the next 10 years for aquaculture operations in the Gulf EEZ.

NEPA Process

As a Programmatic EIS (PEIS), future additional NEPA documentation tiering from this PEIS may be inferred. However, it is unclear if additional documentation for site-specific impacts would be prepared for each individual operation sited in the Gulf EEZ. Page 1 of the PDEIS states that "[e]ffects falling outside the scope of the actions proposed herein would be further analyzed through additional National Environmental Policy Act analyses conducted by the Council and NOAA Fisheries Service." The PFEIS should further discuss the prospects and "triggers" for developing additional NEPA documentation, including site-specific Environmental Assessments (EAs) or EISs for each individual aquaculture site and operation. The basis for such additional NEPA reviews would primarily be the issuance of NOAA's federal aquaculture permit for each site, although other federal agency permitting may also trigger NEPA document development. Topics for site-specific documentation should include site description (water chemistry, flora & fauna, bathymetry, etc.), local use conflicts competing for the area, size of the proposed aquaculture system with the dimensions and capacity of the aquaculture system, predicted water quality and other impacts attributable to the individual aquaculture operation, and the cumulative impacts of the project together with any neighboring aquaculture systems or other offshore land use.

Background & Issues

The commercial interest in marine aquaculture is to produce additional marine protein for profit. The need for such additional protein stems from the fact that many fishery stocks are experiencing overfishing and over 80% of the seafood consumed in the US is imported (pg. 17). Onshore and nearshore aquaculture systems have existed for some time (onshore ponds and lagoons, offshore cages, net pens) to supplement wild-capture fisheries, and are essentially aquatic/marine farming operations similar to agricultural Concentrated Animal Feeding Operations (CAFOs). Offshore mariculture in the Gulf EEZ, however, is presently not sufficiently regulated for sustained commercial use.

Overview of Issues: Concerns with aquaculture operations include water quality (over-feeding, antibiotic medication, algal blooms, and pathogens); the potential use of Genetically Modified Organisms (GMOs) or transgenic organisms engineered to maximize their efficient culture (e.g., increased growth rate); the domestication of cultured species (loss of fitness compared to wild populations); escapement of genetically modified or unmodified-but-domesticated species and their subsequent interbreeding with wild populations; disease infestation and pathogen transmission to wild populations; use of wild fish as broodstock and a feed source (baitfish/meal); risk of storm damage and generation of derelict infrastructure that could act as "ghost" fishing gear; entanglement or predation by wild species attracted to the facility; effects on the restoration management of wildstock fisheries; privatization of a public resource (state or federal waters) for profit; and public opposition and socio-economic use conflicts with competing users such as commercial and recreational fishers, the shipping industry and conservationists.

Water & Sediment Quality: Consistent with the Clean Water Act (CWA), water quality issues associated with aquaculture are of primary concern to EPA. We note that some of these water quality issues have been minimized with improved vaccination and feeding techniques (pg. 10). Monitoring of cages offshore New Hampshire and Puerto Rico showed little or localized changes in water quality attributable to aquaculture, although some changes in benthic communities were observed (pg. 189). Moreover, given that the proposed FMP would be for aquaculture operations in federal waters further offshore, water quality may be less of a concern than in nearshore facilities since operations in federal waters can be located in deeper water with greater circulation. However, since the PDEIS only estimates (pg. 71) the size of expected aquaculture operations, water quality effects at individual sites and cumulatively with any neighboring sites is somewhat unclear. To further disperse water and sediment quality impacts due to organic loading from feeding and wastes, EPA agrees (see Action 6 of the proposed FMP) that operations might be periodically moved (or allowed to fallow) within the designated site complex to allow benthic recovery from excess nutrients, and that any neighboring sites not be clustered. Viral and other diseases may also be considered a water-quality-related concern. Diseases stemming from the broodstock, food source (baitfish/meal), stock handling, predators (sea birds) and other sources of contamination should be controlled to help ensure aquaculture success and to prevent epidemics that could spread to the native environment and its marine inhabitants. The PFEIS further discuss potential impacts to water and sediment quality as it relates to offshore aquaculture sites in the Gulf EEZ.

While the offsite location of aquaculture systems in the Gulf EEZ may have some water quality advantages, the construction and supply of these sites can be more expensive than current onshore or nearshore operations in state waters, since they are located in federal waters that are further offshore (3-200 mi). From a cost effectiveness standpoint, it is therefore somewhat unclear as to why investors would select federal waters over closer nearshore waters for their aquaculture operations. However, on-site location of broodstock hatcheries could minimize such transit costs (pg. 29) and most of the Gulf EEZ areas considered suitable are located closer to 3 miles rather than 200 miles offshore.

Native Species Attraction & Control: Another persistent concern with aquaculture sites is their attraction (pg. 60) of predators (e.g., sea birds, sharks) and non-predator visitors (e.g., various fishes). The natural attraction of marine life to aquaculture structures is related to their search for food (overfeeding of aquacultured stocks and a captive aggregation of prey) and cover (structure, habitat, flotsam/jetsam) in open water. This behavior can be further complicated if the attracted species are protected by the MSA (managed fisheries), Endangered Species Act (e.g., sea turtles and marine mammals) and the Migratory Bird Treaty Act (various migratory birds). Furthermore, certain attracted species such as sea birds may carry and spread disease vectors that could pose a threat to aquacultured stocks. Although the PDEIS discusses predator control through acoustics, barriers, chemicals and electricity (pg. 193), we recommend that protected species – if not all species – should only be repelled rather than killed using benign methods. The use of chemical repellants that will remain in the water column and may affect sessile marine life, should be avoided. The PFEIS should further discuss how any problematic

sea birds, sea turtles and marine mammals will be controlled and how their potential entanglement would be resolved. It should also be clarified when aquaculture facilities might have to obtain additional permits such as a Migratory Bird Treaty Act permit.

Privatization of Public Resource: Although not within EPA's purview, privatization of a public resource for profit is another significant aquaculture issue. Issuance of a permit to establish an offshore marine aquaculture system affords private enterprise exclusive use of public property (open ocean) over competing uses through a fairly simple and essentially free permitting process (even though permits can be revoked for cause and must periodically be renewed). Accordingly, those members of the public presently using Gulf areas for fishing or recreation would be excluded from these benefits in the future if those areas become aquaculture sites.

Federal Regulatory Roles

EPA's Role: EPA's role for marine aquaculture operations in the Gulf EEZ is clearly defined. For these federal waters, EPA has statutory authority to administer NPDES permits and has determined that net pens constitute "concentrated aquatic animal production" facilities under the CWA and are thus subject to permit requirements. EPA has also determined that the Ocean Disposal Criteria of CWA § 403(c) applies, thus mandating an environmental effects review of aquaculture projects. In addition, EPA has a role in registering and regulating pesticides that may be used at the facility and also designates (together with the COE) Ocean Dredged Material Disposal Sites (ODMDSs) in state or federal waters under the Marine Protection, Research and Sanctuaries Act (MPRSA) of 1972.

Other Federal Roles: The U.S. Army Corps of Engineers (COE) is the permitting agency for a Section 10 permit (River and Harbors Act of 1899) relative to the siting and mooring of the aquaculture facility. Beyond its role for the proposed FMP, NOAA (NOAA Fisheries Service) regulates Essential Fish Habitat (EFH) and federally-protected threatened and endangered marine species (Endangered Species Act of 1973). NOAA also administers the Coastal Zone Management Act of 1972, which requires a consistency determination with approved state coastal zone management programs for federally-permitted activities that affect land, water, or natural resources of the coastal zone. Other federal agencies, such as the U.S. Coast Guard (USCG), Minerals Management Service (MMS) and U.S. Food and Drug Administration (FDA) also have (or may have) roles in the siting, construction and/or operation of an offshore marine aquaculture facility in the Gulf EEZ.

NOAA's Authority: EPA agrees that NOAA is the appropriate federal agency to administer the majority of the federal regulations for offshore marine aquaculture. However, NOAA's authority in some areas of offshore aquaculture for the proposed aquaculture FMP should be clarified in the PFEIS. Although EPA understands the rationale behind the proposed limitations, additional rulemaking or legislation may be needed to strengthen NOAA's authorities under MSA. However, EPA will defer to NOAA in this regard. For example, NOAA's authority to remove portions of the public

domain from public use for private aquaculture enterprise (Action 6) as opposed to traditional conservation, should be discussed. Similarly, NOAA's authority to limit aquaculture to native Gulf species (Action 4) as opposed to modified species engineered to maximize their efficient culture for profit, should also be addressed. In addition, NOAA's authority to limit free enterprise by capping production by a single operator to no more than 20% of the established aquaculture optimum yield (Action 10) should also be reviewed.

One potential new legislation on aquaculture is the Administration's bill for the National Offshore Aquaculture Act of 2007 (pg. 12 and App. B) currently before Congress. If this bill becomes law, it would afford NOAA more authority; however, we note that the present version of the bill does not always parallel the proposed aquaculture FMP (e.g., the permit term for NOAA's aquaculture permit in the bill is 20 years while the term for the preferred alternative of the FMP is 10 years). As such, portions of the prospective FMP may be preempted if the bill is passed, and may need to be adapted or replaced. The PFEIS should further discuss this bill and the regulatory consequences for the aquaculture FMP, should it become law.

Alternatives

Overall, EPA believes that alternatives for offshore marine aquaculture operations should not produce water quality problems associated with overfeeding, wastes and medications. Operations should also be limited to the culture of those native Gulf species managed by the Council (since those managed species cannot be further exploited in the wild) and not use endangered species for culture (pg. 43) or impact them (e.g., entanglement of marine mammals in net pens). The FMP should also ensure that the management objectives for the species being restored by the Council and NOAA in the Gulf are not compromised through the capture of broodstock for hatcheries or baitfish for feed or the culture of non-native or genetically modified species that could accidentally be introduced by escapement to the wild. Use conflicts should also be minimized through the proper siting of aquaculture operations.

A Systems Alternative to Aquaculture: At least one "systems" alternative to offshore marine aquaculture exists – the creation of a more globally competitive U.S. fishing fleet. That is, achieving greater US landings in competition with prominent global fishing nations could – like offshore marine aquaculture – result in less need for importation of seafood. However, it is likely that such greater US effort and landings would result in even greater exploitation of global fisheries as opposed to a more even distribution of landings by fishing nations. It would also only increase or redistribute wild-capture marine protein (which is a finite resource) as opposed to supplementing it with another source of seafood.

Actions & Alternatives Considered: We appreciate that 10 actions with 28 alternatives were considered in the PDEIS and that NOAA and that the Council identified their preferred alternative for each action. These actions considered permitting, accounting, site and species selection, types of aquaculture systems, and administrative frameworks

for the FMP. Overall, we find the actions, alternatives and preferred alternatives presented in the PDEIS to be well-conceived. We have provided our suggestions and comments for each action in the enclosed *Detailed Comments* for consideration by NOAA and the Council in their development of the NOAA PFEIS. Of the 10 actions proposed, EPA finds siting requirements (Action 6) primary to the regulation of offshore marine aquaculture, as emphasized below:

Significance of Proper Siting: Proper siting of aquaculture systems would help protect water quality and minimize use conflicts. We suggest a combination of Alternatives 2 and 3 of Action 6 to provide a sequential order of siting criteria used to determine the most suitable sites. That is, NOAA's pre-defined aquaculture zones (Alt. 2), which were screened from the generally suitable areas of the Gulf EEZ, would be used by aquaculture investors to apply for a COE Section 10 siting permit. If the site was permitted by the COE, a final NOAA review using NOAA's environmental criteria (Alt. 3) would determine final site suitability. These final criteria should include proper flushing of the aquaculture system to ensure good site water quality.

Proper siting of facilities can also minimize use conflicts that can exist within the Gulf EEZ areas considered suitable for aquaculture. Competing public and federal users of EEZ waters include investors of aquaculture and other interests (oil & gas, minerals, offshore wind farms, Liquefied Natural Gas [LNG] terminals), U.S. Department of Defense (offshore Naval sites & sonar testing), commercial fishers, recreational fishers and other recreators, and conservationists. The PFEIS should further discuss the socioeconomic implications of siting private aquaculture operations within the public domain, thereby excluding existing or future use of those areas by the general public. In addition to socioeconomic conflicts, ecologic conflicts among native marine inhabitants can also result by establishing and operating aquaculture sites. Consistent with the ecosystem management approach to manage fisheries, the potential displacement of native species by aquaculture sites should be further addressed since aquaculture operations would only be located in ecologically suitable areas where other marine species are likely to live.

Summary

EPA agrees that a FMP is needed to help regulate offshore marine aquaculture. Water quality issues associated with aquaculture operations are of primary concern to EPA. These principally concern the potential for excess nutrients from overfeeding and animal wastes that can cause organic loading within the water column (affecting algal blooms) and on-site sediments (affecting benthic assemblages). For proper aquaculture siting, we recommend that sites be located using NOAA and COE siting criteria (Action 6) to provide adequate flushing of excess nutrients, and that sites be large enough to rotate operations onsite to promote the recovery of water quality and sediment quality as needed. The use of chemicals to repel predators and other marine visitors attracted to an aquaculture system's infrastructure should also be avoided from a water quality perspective. Similarly, diseases stemming from the broodstock, food source, stock

handling, predators and other sources of contamination should be monitored for early detection and controlled to prevent epidemics that could spread to the native environment and its marine inhabitants.

Beyond water quality, proper siting should also minimize use conflicts competing for EEZ Gulf areas. We agree (Action 4) that aquacultured stocks should best be limited to native species being managed by NOAA and the Council through FMPs and not expanded to non-native, GMO or transgenic species due to the risk of their escapement and interbreeding with native populations. Parenthetically, to help ensure success, we also recommend that animal behavior be considered in the selection of potential aquaculture species such that pelagic, non-migratory species might best be used for near surface systems and demersal species for benthic systems. We also concur (Action 8) with the need for accountability/transparency through recordkeeping and NOAA inspections. Because the regulation of offshore marine aquaculture is a relatively new arena, we suggest (but defer to NOAA in this regard) that NOAA's authority in certain areas – such as privatization of a public resource – be further discussed and strengthened as needed with additional rulemaking or legislation. Also, the impacts of potential events associated with aquaculture should also be further addressed in the PFEIS (broodstock collection frequency, broodstock inbreeding, aquacultured stock escapement, interbreeding/hybridization with wild stocks of the same species, aquaculture disease infestations and transmittance to the wild, algal blooms due to organic loading, etc.).

Future, site-specific NEPA documentation should be provided for the 5-20 individual sites expected in the Gulf EEZ. Topics for such follow-up documentation should include site description, local socioeconomic impacts such as use conflicts and privatization of a public resource, size of the proposed site with the dimensions and capacity of the aquaculture system, predicted water quality and other impacts attributable to the individual aquaculture operation, socioeconomic impact sand the cumulative impacts with any neighboring aquaculture systems or other offshore land use. In general, topics such as aquaculture system size and stock capacity should be generally discussed in the PDEIS (e.g., expected ranges) and specifically discussed in the site-specific NEPA documentation.

EPA PDEIS Rating

EPA rates this PDEIS as "EC-1" (Environmental Concerns with some additional information requested in the PFEIS). Overall, EPA supports the concept of aquaculture to supplement wild-capture fisheries if water quality impacts are regulated and capacities of aquaculture sites are limited and sites are not clustered. However, we have a few water quality and other concerns/comments that should be at least generally addressed in the PFEIS and more specifically in the follow-up, site-specific NEPA documents.

We appreciate the opportunity to review the PDEIS. Should you have questions regarding these comments, feel free to contact Chris Hoberg of my staff at 404/562-9619 or hoberg.chris@epa.gov.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office

cc: Dr. Rodney F. Weiher – NEPA Coordinator (NOAA): Silver Spring, MD

DETAILED COMMENTS

EPA offers the following comments and suggestions on the 10 actions and 28 alternatives presented in the PDEIS. Other comments are also subsequently provided.

Actions & Alternatives

* **Action 1 (*Aquaculture Permit Requirements, Eligibility, and Transferability*)** – EPA agrees that offshore aquaculture regulations should include a NOAA Fisheries Service aquaculture permit to regulate offshore marine aquaculture. Under Alternative 2 preferred by the Council, the aquaculture permit provides authorization for the operation of a facility, securing hatchery fish from broodstock, the transport and sale of cultured finfish or shellfish, and other actions. We agree that permits can be transferable, as proposed in Preferred Alternative 2a; however, this assumes that the operation is in compliance with the permit or will be by the new operator. More importantly, we note that the NOAA aquaculture permit would also undergo a public review for comments. Because of potential socio-economic impacts (use conflicts) associated with aquaculture operations in public waters (also see discussion below under Action 6), we strongly support the permit public review process.

The NOAA permit under Alternative 3 would also be for the operation of an aquaculture system; however, it would also be for siting the operation in addition to a COE siting permit. This separate permit would emphasize NOAA siting criteria in addition to the COE's criteria in their Section 10 permit. While there are environmental advantages to having a separate NOAA siting permit in addition to the COE's Section 10 siting permit because of their unique siting criteria, it would be an additional administrative exercise for both NOAA and the applicant that may not be necessary (also see discussion below under Action 6).

* **Action 2 (*Application Requirements, Operational Requirements, and Restrictions*)** – EPA generally agrees with the application and operational requirements associated with PDEIS-Preferred Alternative 3 of Action 2. We particularly concur with requirements to collect broodstock from the Gulf in the same general area as the aquaculture site; to generate a storm disaster plan; to conduct feed monitoring for water quality purposes; to provide health certificates of specimens prior to the stocking of cages, net pens or other grow-out systems; to host annual NOAA Fisheries Service inspections of facilities; to post an assurance bond for removal of infrastructure in the event of abandonment; and to disallow the culture of GMOs or transgenic organisms.

Portions of Alternative 3 pertain to the collection of broodstock (pg. 37). The PFEIS should discuss how often broodstock subjects need to be collected (are they collected for each hatchery spawn or are tagged adults retained in cages for additional spawns?) and what is the fate of the broodstock adults after spawning (are they released, or retained and eventually harvested with mature cultured fingerlings?). We recommend the collection of new broodstock for each spawn (broodstock may not spawn a second time in captivity

anyway) to refresh the genetic pool for the hatchery and prevent in-breeding; however, this would require multiple collections adding fishing pressure on overfished (managed) stocks. Accordingly, the PFEIS should discuss the effects of harvesting broodstock from managed overfished stocks. Would the broodstock collections for the expected 5-20 offshore marine aquaculture operations notably impact the wild stocks of managed species and potentially compromise FMP objectives? Page 68 indicates that broodstock collections are expected to be "small and insignificant." However, should broodstock collections become more frequent for genetic diversity or expansion of the offshore industry, will the FMP account for such collections by reducing quotas for fishers of wild stocks of the same species?

With regard to the culture of non-native species or even GMOs or transgenic organisms, it is possible that certain investors would wish to use modified organisms to expedite growth or other aspects to maximize aquaculture landings and profitability. However, EPA supports the position of NOAA and the Council to preventing the use of modified organisms due to the risk of escapement and their interbreeding with wild native populations. Nevertheless, cultured specimens would be come domesticated and "less fit" than wild specimens of the same species. The PFEIS should discuss the impacts of presumed escapement of some of the aquacultured stocks and their inbreeding with wild stocks of the same species.

* **Action 3 (*Duration of the Permit*)** – We concur with Alternative 2 preferred by the Council which specifies a 10-year term that can be renewed every five years. We agree that an initial 10 years is needed for most investors to establish their operations and that permits should not be too long-termed for better control. It is unclear, however, why other alternatives do not offer a similar possibility for permit renewal as opposed to a requirement for filing for a new permit.

Although a 10-year term with a 5-year renewal is preferred in the PDEIS, we note that a bill for the National Offshore Aquaculture Act of 2007 (pg. 12) before Congress proposes a 20-year term and a 20-year renewal (App. B). While we are aware that this bill and not law, the PFEIS should discuss this substantive inconsistency in permit terms, assuming NOAA participated in the development of this bill.

It is also our understanding (pp. 4, 72) that an aquaculture permit could be revoked for cause (Subpart D of 15 CFR Part 904). We concur with such a provision; however, the PFEIS should specify NOAA's terms and conditions for such an action. From a practical standpoint, when would an aquaculture permit likely be revoked and what entity would manage the unpermitted facility?

* **Action 4 (*Species Allowed for Aquaculture and Included in the Aquaculture Fishery Management Unit*)** – As suggested above, we agree that species selected for aquaculture should be native Gulf species found near the aquaculture site and should primarily be those species being managed for restoration via a FMP to supply a greater food source of those species without additional exploitation of the wild stocks. However, it is unclear from the PDEIS if aquaculture systems would only be set at or near the surface of the

water column for pelagic species or if any would utilize bottom habitat for demersal species, i.e., would the Gulf EEZ waters generally be too deep for bottom aquaculture systems or would they still be manageable in the 13.7% of the EEZ considered suitable? We note that while Alternatives 2-4 would all restrict some species, Alternative 4 (preferred in the PDEIS) would essentially allow the culture of all managed native species, including demersal species other than shrimp and coral. The PFEIS should clarify if all sections of the water column could be used for culturing.

From a practical standpoint, not all species would be ideal or suitable for successful aquaculture. For example, the culture of highly migratory pelagic species (billfish, tunas, swordfish & sharks) allowed in Alternative 2 and 4 (pending) seems counter-intuitive from a fish behavior perspective given the migratory instincts of these species and the confined nature of mariculture cages, net pens and other enclosures. We therefore offer that the use of migratory species would intuitively not seem to be good investments and that animal behavior be considered in the selection of aquaculture species. Ideally, those species that have previously been successfully spawned in captivity and successfully raised in hatcheries and grow-out facilities would be selected to help ensure success.

* **Action 5 (*Allowable Marine Aquacultural Systems*)** – Historically, cages and net pens have been used in offshore aquaculture. However, new designs are possible and should be encouraged (especially for deeper waters such as the Gulf EEZ). We therefore agree with the PDEIS preference for Alternative 3, which would allow a case-by-case approval or denial of designs. We also concur with the inclusion of an environmental effects review. We strongly agree with those review criteria provided on page 49 that would promote systems to minimize the degradation of habitat and water quality from feeding mechanisms and waste dispersion. Although no specific system designs are required, we support Alternative 3's disallowance of systems that cause significant risk to EFH, endangered species, marine mammals, fish stocks, and public health and safety (pg. 51).

* **Action 6 (*Marine Aquaculture Siting Requirements and Conditions*)** – EPA finds siting requirements critical to the regulation of offshore marine aquaculture since proper siting would help avoid reduce water quality concerns and potential use conflicts with physical, socio-economic and ecologic conditions. We note that only about 13.7% of the Gulf is considered suitable for siting aquaculture systems (pg. 53).

Specific physical use conflicts in the Gulf that aquaculture site might include existing fisheries (fishing grounds), shipping lanes, naval facilities and testing, designated marine preservation areas, designated disposal sites (e.g., ODMDSs) and other uses. Many of these are referenced in Alternatives 2 and 3 (outstanding ones should be discussed in the PFEIS). Also, ecologic use conflicts may also exist, i.e., how will the existing marine ecosystem respond to the introduction of a concentration of specimens from a water quality, habitat and behavioral perspective? Will other marine life avoid the area as a disturbed area or will the system be an attractant as new food or cover area?

Socio-economic use conflicts may also occur since issuance of an aquaculture permit to establish an offshore marine aquaculture system allows private enterprise exclusive use

of public property through a fairly simple permitting process. Accordingly, fishers that may presently be using Gulf areas would be excluded from these benefits in the future if those areas become aquaculture sites.

With regard to the presented alternatives for Action 6, we note that Alternative 3 is preferred by the Council. It establishes numerous marine siting criteria for suitable aquaculture sites: avoidance of designated marine areas such as marine reserves; separating facilities by at least 1.6 nautical miles (nmi); sizing the site to be twice the size of the aquaculture system, so that rotation and fallowing of systems within the site is possible; production of a video of the benthic habitat at the site; and characterization of the site by NOAA (currents, water chemistry, migratory routes, live bottoms, etc.).

Although we generally concur with these criteria, the PFEIS should clarify the basis for selecting a separation distance of 1.6 nmi (6,076 ft). Page 57 suggests that the separation is to minimize the spread of pathogens from one facility to a neighboring one. The cited literature (pg. 57) provides a range of 800 m (2,625 ft) to 8 km (26,248 ft) depending on the species being cultured. Although 1.6 nmi lies within this range, it remains unclear as to why 1.6 nmi was selected since the fishery species to be cultured (and presumably their pathogens) are unknown.

Beyond a buffer for pathogens, the adequacy of the 1.6 nmi distance is also uncertain in terms of water quality since the general size (or size range) of each operation is undefined in the PDEIS and perhaps unknown at this time. Page 71 estimates that operations would use 6-12 cages approximately 3,000-6,000 m^3 in size and produce 22-44 pounds per m^3. However, the PFEIS should provide any additional information (ranges) on the size and stock capacity that can be expected for EEZ operations and whether the 1.6 nmi separation distance would be adequate for dispersion from a water quality standpoint.

Although we support the specific siting criteria of Alternative 3, EPA prefers a combination of Alternatives 2 and 3. Alternative 2 screens suitable Gulf areas by establishing 13 aquaculture zones (encompassing 5% of Gulf EEZ and 36% of areas considered suitable) where applicants could locate their aquaculture grow-out systems. We assume these pre-defined zones (pg. 56) would avoid obvious physical use conflicts (discussed above) such as shipping lanes and active fishing grounds, while providing adequate marine conditions for aquaculture. Within these zones, investors would need to apply for a COE Section 10 permit for a specific site, which would be assessed pursuant to COE criteria. Beyond these COE criteria, NOAA could then use their siting criteria under Alternative 3 to further assess the suitability of the site. These final criteria should include proper flushing of the aquaculture system to ensure good site water quality.

* **Action 7 (*Restricted Access Zones for Marine Aquaculture Facilities*)** – We agree with the use of a buffer area around the site of the actual marine aquaculture system to restrict access by unauthorized vessels. The use of the coordinates of the COE siting permit – as proposed by the PDEIS-Preferred Alternative 2 – seems appropriate. We agree with page 60 that restricting access around the aquaculture site may reduce ship strikes with marine mammals that may be attracted or entangled to the aquaculture

system for food or cover. We assume the COE siting permit would need to allow for the site to be about twice as large as the actual aquaculture system to provide for a restricted buffer and to be consistent with subpart 'c' of Preferred Alternative 3 of Action 6 on siting requirements. EPA supports such a large site to create the restricted buffer area as well as to allow for aquaculture systems to be rotated onsite for water quality purposes. The boundary of the site/buffer, as indicated in Alternative 2, would need to be marked with buoys and enforced by the USCG.

* **Action 8 (*Recordkeeping and Reporting*)** – Alternative 2 was preferred in the PDEIS. This alternative establishes numerous recordkeeping requirements for transparency. These appear appropriate to EPA and include the recordkeeping or reporting of a significant escapement of the cultured stock, copies of federal permits, harvest and sales of the cultured stock, hatchery records, broodstock harvest times, pathogen episodes, etc. These records can be useful during audits to determine, for example, that no more than the original number of fingerlings are harvested and sold to ensure that wildstock specimens were not mixed in and sold as aquacultured stock. Conversely, we note that keeping such records – even if electronically in many cases – plus completing annual NOAA site inspections could be a significant workload for the applicant and NOAA, such that attempts to streamline recordkeeping should be a continuous process.

With regard to requirement 'n' of Preferred Alternative 2 involving the reporting of broodstock lengths and weights, we offer that such manipulation could be traumatic to many species. Perhaps the broodstock could be subsampled to obtain representative weights and lengths so that not all specimens are handled. Overall, impacts to the broodstock should be minimized to ensure a good spawn for hatchery eggs and larvae, and ultimately fingerlings.

* **Action 9 (*Biological Reference Points and Status Determination Criteria*)** – Consistent with other more conventional FMPs for wild-capture fishery species, biological reference points such as Maximum Sustainable Yield (MSY) and Optimum Yield (OY) were also established for aquaculture harvests. We will defer to NOAA and the Council regarding the establishment of these reference points. Although required under MSA, such reference points seem to have less meaning for aquaculture than for conventional fisheries management. We note that NOAA permitting will limit production to no more than 20% of the established OY (pg. 72).

* **Action 10 (*Framework Procedures*)** – This action relates to Action 9 by specifying framework procedures for modifying reference points. PDEIS-Preferred Alternative 3 proposes the Council's appointment of an Aquaculture Advisory Panel (Panel) to evaluate the aquaculture management program. The recommendations of the Panel would need approval by the Council as well as a regulatory amendment and ultimately approval by NOAA.

Overall, we will defer to NOAA and the Council regarding these administrative procedures. However, we note that a considerable amount of administrative effort (reporting, recordkeeping, inspections and audits, testing, approvals at several levels of

management, rulemaking and NEPA documentation, etc.) is being proposed for this FMP for a relatively small number of operations (5-20) of offshore marine aquaculture of uncertain size that have been predicted for the next 10 years.

Other Comments

* EFP Definition (pp. *x* & 16) – The abstract (pg. *x*), list of acronyms (pg. *vii*) and text in general (e.g., pg. 19) defines "EFP" as an "exempted fishing permit". However, page 16 defines it as an "experimental fishing permit". We assume this is an inconsistency, or does NOAA issue two kinds of "EFP" permits?

* NOAA Oversight (pg. 13) – The proposed FMP regulations would require considerable transparency which translates into recordkeeping, reporting, possible testing, audits and inspections. Although some activities are electronic and remote, others such as annual inspections are not and could be labor/time intensive. In times of resource constraints, we look to NOAA to adequately fund this oversight, particularly given the apparent large volume of the records and the long offshore distance of the facilities.

* Foreign Aquaculture Competition (pg. 17) – We note that one-half of the seafood the US imports is produced from aquaculture. As such, how competitive are the prospective 5-20 offshore operations expected to be with established foreign aquaculture farms? Will there be any US government subsidies to help ensure their success?

* Successful Hatchery /Aquaculture Species (pg. 45) – The PFEIS should provide information as to how many native Gulf species have been successfully spawned, reared to fingerlings, and cultured to economic maturity. Offshore aquaculture would seem an expensive investment for marine species that may not have been successfully raised in captivity.

* Aquaculture Potential (pg. 71) – Page 71 states that "...aquaculture has the potential to result in much greater production than wild fisheries..." This statement should be further discussed in the FPEIS given the annual tonnage of wild-capture fishery landings, aquaculture competition with wild populations for food and space, use conflicts, aquaculture feed limitations, and aquaculture cumulative impacts potential.

* Oil & Gas Impacts (pp. 130 & D-5) – Although there is some information regarding potential contamination of aquaculture facilities by wastes from the oil and gas industry, there is no mention of monitoring to verify the water and sediment quality conditions (e.g., mercury). Although oil and gas facilities may have EPA discharge permits, the potential cumulative impacts of oil and gas operations on nearby or collocated aquaculture facilities should be described in more detail – particularly if aquaculture systems are actually collocated with drilling platforms.

* Marine Turtles & Mammals Effects (pg. 190) – Will there be inspections or reporting requirements to monitor whether sea turtles and/or marine mammals are routinely caught

in the aquaculture nets? What penalties, if any, will be enforced if entanglements are persistent and fatal?

* On-site Seafloor Video (pg. 229) – How will NOAA verify if an applicant's video survey of the on-site benthic habitat is of the proper location and not fraudulent (i.e., video of a different location). We suggest providing guidelines for the video surveys or providing a reference for existing guidance in the PFEIS.

* Catastrophic Storm Frequency (pg. 238) – As part of the cumulative effects analysis, how many catastrophic storms are predicted over a given timeframe and would this frequency be affected by climate change or other factors, such as the density of aquaculture facilities in a given region of the Gulf EEZ?

* Cumulative Effects Analysis (pg. 264) – The PDEIS estimates (pg. 1) that 5-20 aquaculture applications will be submitted to NOAA for aquaculture operations over the next 10 years. This number of operations – or an update – should be used in the cumulative impacts analysis in the PFEIS (Sec. 6.15).

* Algal Blooms – Given the likelihood for organic loading at aquaculture sites, the PFEIS should discuss the potential for such excess nutrients triggering algal blooms.

* Marine Debris – We support the use of pingers on aquaculture systems so that cages and other infrastructure can be recovered after catastrophic storm events. Because derelict infrastructure could entrap various species like "ghost" fishing gear – including those species of managed fisheries – these pingers should be monitored (batteries, etc.) to ensure their function after such events.

* Potentially Controversial Issues – We raise to your attention three issues associated with the proposed action that may prove controversial:

1) The proposal to privatize a public resource without compensation is inconsistent with the U.S. Commission on Ocean Policy's recommendations made in its 2004 report, *An Ocean Blueprint for the 21st Century*. For example, the government collects grazing fees from ranchers, royalties from timber and mining companies, and bonuses and royalties from outer continental shelf oil and natural gas. The DPEIS does not address why ocean space should be treated differently.

2) The proposed action proposes to privatize "the wild," which raises the question of whether a permitted aquaculture facility is subject to regulations enacted to protect "the wild," e.g., 50 CFR Part 16.13(1) regarding the prohibition of fish releases into the wild except by or under the permission of the applicable state wildlife conservation agency. In a scenario where non-native species were released into "a fish pen" as opposed to the open ocean, would this still constitute a release into "the wild" pursuant to 50 CFR Part 16? If not, will NOAA Fisheries Services and the Council still have the requisite authority to exclude non-native species from aquaculture?

3) The DPEIS proposes a "use or loose" permit to be issued to those applicants most likely to ensure the most efficient and economical use of fishery resources to prevent speculation. A collateral effect of a "use or loose" permit would be to bar acquisition by any entity interested in conservation. Conversationalists, including governmental agencies (e.g., the State of Florida), commonly acquire property interests to implement the public interest in conservation. It appears this provision would prevent these types of acquisitions (at aquaculture sites) for a legitimate public interest, which could generate controversy.