INTRODUCTION

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan (FMP). Section 305(b)(2) of the Magnuson-Stevens Act requires Federal action agencies to consult with NOAA's National Marine Fisheries Service (NOAA Fisheries) on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

The EFH Guidelines (50 CFR 600.05 - 600.930) outline the process for Federal agencies, NOAA Fisheries and the Fishery Management Councils to satisfy the EFH consultation requirement under Magnuson-Stevens Act. The EFH Guidelines require Federal action agencies to prepare an EFH Assessment describing the effects of that action on EFH (50 CFR 600.920(e)(1)). The EFH Assessment is a necessary component for efficient and effective consultations between a Federal action agency and NOAA Fisheries.

To assist Federal agencies in developing EFH Assessments, this guide contains EFH definitions, responses to frequently asked questions concerning preparation of EFH Assessments, and some examples of completed EFH Assessments.

DEFINITIONS

Essential Fish Habitat (EFH): those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity (16 U.S.C. 1802(10)).

Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate (50 CFR 600.10).

Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities (50 CFR 600.10).

Necessary means the habitat required to support a sustainable fishery and the...
Healthy ecosystem means an ecosystem where ecological productive capacity is maintained, diversity of the flora and fauna is preserved, and the ecosystem relates the ability to regulate itself. Such an ecosystem should be similar to comparable, undisturbed ecosystems with regards to standing crop, productivity, nutrient dynamics, trophic structure, species richness, stability, resilience, contamination levels, and the frequency of desired organisms (50 CFR 600.10).

Adverse effect means any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of or injury to, biotic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810(a)).

Why do the EFH guidelines require Federal action agencies to prepare an EFH Assessment?

The EFH guidelines require Federal agencies to prepare EFH Assessments to evaluate the effects of proposed actions on EFH and Federal managed fish species. As EFH Assessment, either detailed, and referenced as such, in an existing environmental document (EA or EIS) or a stand alone EFH Assessment, is the beginning of a cooperative exchange of information assessing any effects to EFH and offers ways to minimize any adverse effects. Additionally, the information is necessary for NOAA Fisheries to fulfill its statutory responsibility to provide EFH conservation recommendations to minimize adverse effects of any proposed action.

The cooperative exchange of information, and any conservation recommendations, between NOAA Fisheries and Federal agencies is vital for effective and efficient consultation and for the action agency to fulfill its consultation requirements. The EFH Assessment allows NOAA Fisheries to promptly develop EFH conservation recommendations that are based upon complete information about the proposed action.

When is an EFH Assessment Required?

A Federal agency must prepare an EFH Assessment for any Federal action that may adversely affect EFH (50 CFR 600.920(e)(1)). A Federal agency must first determine whether their action may adversely affect EFH. If a Federal agency determines that a Federal action may adversely impact EFH, then the Federal agency must prepare an EFH Assessment. If a Federal agency determines that a Federal action will not adversely affect EFH, then the Federal agency need not prepare an EFH Assessment.
EFH, then the Federal agency is not required to prepare an EFH Assessment. However, if
NOAA Fisheries becomes aware of a Federal action that would adversely affect EFH, but for
which a Federal agency has not initiated an EFH consultation, NOAA Fisheries may
request the Federal agency to initiate EFH consultations, and prepare an EFH assessment.
If the proposed Federal action is similar to a previous action (i.e., involves similar impacts
to EFH), would occur in the same geographic area or similar ecological setting and an
EFH consultation was prepared for that previous action, the Federal agency may
incorporate by reference the completed EFH Assessment and supplemented it with any
relevant new information. If the completed EFH assessment and the supplemental
information would constitute a new EFH Assessment which must be provided to NOAA
Fisheries.

If more than one Federal agency is responsible for a Federal action, then the consultation
may be fulfilled through a lead agency, and only the lead agency must prepare an EFH
Assessment. The lead agency should notify NOAA Fisheries in writing that it has
initiated an EFH consultation for the proposed Federal action, and whether the EFH
consultation has been completed. After the EFH consultation is completed, and another
Federal agency is separately responsible for fulfilling the EFH consultation, or has
completed an EFH Assessment, or both, the completed EFH Assessment must be provided
to NOAA Fisheries.

Where is EFH and what are the species?
NOAA Fisheries’ authority to manage EFH directs related to those species covered
under FMPs in the United States, including Alaska, Hawaii, the U.S. Virgin Islands and
Puerto Rico. EFH sections of FMPs include detailed the history and habitat information
used to describe and identify EFH for each plan’s federally managed species. A complete
list of Federally-managed species is available for each Region upon request. EFH
information can also be found at the internet of each of the NOAA Fisheries Regional
websites or on the NOAA Fisheries Headquarters website address at
http://www.nmfs.noaa.gov/habitat/habitatprotection/efh_designations.htm

What is a Habitat Area of Particular Concern (HAPC)?
HAPCs are subsets of EFH that merit special considerations to conserve the habitat. These
habitat conditions are listed in the EFH Guidelines (50 CFR 600.815(a)(8)) and
summarized as: 1) the importance of the ecological function provided by the habitat; 2) the
extent to which the habitat is sensitive to human-induced environmental degradation; 3)
whether, and to what extent, development activities are, or will be, stressing the habitat
type; and 4) the rarity of the habitat type. HAPC areas have been described with EFH
areas. These areas are detailed in EFH sections of FMPs and are summarized within the
Regional Council Approaches to the Identification and Protection of Habitat Areas of
Particular Concern

Document.

Action Agencies should indicate in the EFH Assessment whether an action(s) may adversely affect HAPC(s). Actions that occur in HAPCs may receive more scrutiny by NOAA Fisheries when developing conservation recommendations. Therefore, action agencies may want to consider extra measures to avoid, minimize, or mitigate adverse effects on EFH within HAPCs.

What goes into an EFH Assessment?

All EFH Assessments must include the following contents stated in 50 CFR 600.920 (e)(2):

1. Description of the action
   What is the action? What is the purpose of the action? How, when, and where will it be undertaken? What will be the result of the action (e.g., 200 ft seawall, 27 new pier pilings, 300 ft sediment removal)?

2. Analysis of the potential adverse effects of the action on EFH and the managed species
   What EFH will be affected by the action? What are the adverse effects to EFH that could occur as a result of the action (e.g., loss of 0.5 acres of seagrass turbidity)? How would they impact managed species (e.g., loss of foraging habitat, removal of cover)? What would be the magnitude of effects? What would be the duration of the effects?

3. Federal agency’s conclusions regarding the effects of the action on EFH
   Would the adverse effects be minimal, more than minimal but less than substantial or substantial based on the information discussed above? What is the spatial extent of the impacts? What is the duration of the impact (e.g., temporary or permanent, short-term or long-term)?

4. Proposed mitigation, if applicable.
   What, if any, measures is the Federal agency proposing as part of the action to avoid, minimize or otherwise mitigate for the anticipated adverse effects to EFH?

Additional information should be included in the EFH Assessment if warranted by the proposed action. For example, an action that may adversely affect an area that is particularly sensitive to disturbance might warrant a more detailed analysis of direct, indirect, and cumulative impacts. Also, for some actions that have substantial effects that would require an expanded consultation, additional information may be necessary in the EFH Assessment. Additional contents suggested in the EFH guidelines include the following:

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1. Results of an on-site inspection to evaluate the habitat and the site-specific effects of the project

On-site inspections can range from informal visits or photographs to formal surveys of the action area with data collection and scientific analysis. It may be helpful in some cases for the Federal agency and NOAA Fisheries staff to visit the action area together.

2. Views of recognized experts on the habitat or species that may be affected

Experts could include university, agency, or private industry personnel with extensive knowledge about the habitat, managed species, or types of effects relevant to the proposed action.

3. Review of pertinent literature and related information

There are various sources of literature that can be reviewed for relevant information about the habitat, managed species, or types of effects relevant to the proposed action, including FMP EFH information, scientific journal articles, environmental documents (e.g., National Environmental Policy Act (NEPA) documents, Forest Management Plans, Restoration Plans, Fish and Wildlife Coordination Act Reports, etc.) and other agency reports.

4. Other relevant information

Anything else that might assist the Federal agency and/or NOAA Fisheries to evaluate the potential adverse effects of the action.

What level of detail should be included in an EFH Assessment?

The level of detail in an EFH Assessment should be commensurate with the complexity and magnitude of the potential adverse effects of the action, 50 CFR 600.920 (e)(2). For example, relatively simple actions that may adversely effect EFH should be brief. Actions that may pose a more serious threat to EFH, or that involve a more complex range of potential adverse effects, would justify a correspondingly more detailed EFH Assessment.

Can EFH Assessments be incorporated into other documents?

Federal agencies may incorporate an EFH Assessment into documents prepared for other purposes such as Endangered Species Act Biological Assessments, NEPA documents, or public notices. If an EFH Assessment is completed in another document, it must still include all of the mandatory contents required by the EFH guidelines. It must also be clearly identified in the table of contents and text of the document as an EFH Assessment. Alternatively, an EFH Assessment may incorporate by reference other relevant environmental assessment documents that have already been completed. The referenced document must be provided to NOAA Fisheries with the EFH Assessment.
How can the EFH Assessment process be combined with existing environmental consultation and review processes?

The EFH guidelines at 50 CFR 600.920(f) enable Federal action agencies to use existing consultation or environmental review procedures to satisfy the Magnuson-Stevens Act consultation requirements if the procedures meet the following criteria: 1) the existing process must provide NOAA Fisheries with timely notification of actions that may adversely affect EFH; 2) notification must include an assessment of the proposed action’s impacts on EFH that meet the requirements for EFH Assessments discussed in section 600.920(e); and 3) NOAA Fisheries must have made a finding pursuant to section 600.920(f)(3) that the existing process satisfies the requirements of section 305(b)(2) of the Magnuson-Stevens Act.

Examples of EFH Assessments

Following are three examples of EFH Assessments: two were developed for abbreviated EFH consultation, and the third was developed for an expanded EFH consultation. These examples were adapted from authentic EFH assessments for the purpose of this guidance document. NOAA Fisheries has included some review comments in bold, italic, and indented text in order to provide additional suggestions to strengthen the examples.
Example 1: EFH Assessment Example No. 1.

TO: NOAA Fisheries
FROM: ACTION AGENCY
RE: Essential Fish Habitat Assessment
DATE: February 10, 1999

ACTIVITY: Construct an 85 slip marina and associated facilities in Barndoor Bay, NJ. March 10, 1999

PROJECT: Construct an 85 slip marina and associated facilities in Barndoor Bay, NJ. March 10, 1999

The project is described as follows:

1. Excavate 1.8 acres of the United States' navigable waters to create a boat basin and channel. Basin to be dredged to -6.0 MLW and channel to -7.5 MLW.
2. Fill 1.5 acres of the United States' navigable waters to create a bulkhead for boat basin, parking lot, roadways, and fuel storage tanks.

The example clearly states the proposed action and action area.

EFH DESIGNATIONS: The area of the proposed action (Barndoor Bay) has been identified as Essential Fish Habitat (EFH) for several species of fish. The designations are as follows: summer flounder (larvae, juvenile and adults), scup (all life stages), black sea bass (larvae, juveniles and adults), bluefish (juveniles and adults), Atlantic herring (juveniles and adults), windowpane flounder (all life stages), winter flounder (all life stages including spawning adults). In addition to these EFH designations, a Habitat Area of Particular Concern (HAPC) has also been identified as submerged aquatic vegetation (eel grass) beds for larval and juvenile summer flounder.

Identifying which EFH species the action agency has initially found to be within the project areas demonstrates the agency’s awareness of EFH requirements and demonstrates that the action agency is committed to assessing its action and minimizing any adverse affects on EFH from their action.

ASSESSMENT: The above fish species are not estuarine resident species and therefore only utilize this area on a seasonal basis, primarily in the warmer summer months. During the summer months the estuary is typically utilized as a forage area for juveniles and adults and nursery area for larvae and juveniles. The summer months are typically considered the best for the species included in this project.

The proposed in-water work is scheduled to be undertaken from September 1, 1999 through March 31, 2000. All in-water work will be completed at times when most of the above species are not expected to be present with the exception of winter flounder. Therefore, it is reasonably well assured that there will be no physical impact to these species. Winter flounder, however, spawn during the months that dredging and boat basin construction will be occurring. Since winter flounder spawn in the summer months rather than winter months, it is probable that the winter flounder will not be adversely affected. The small area of winter flounder disturbance is relatively small scale (1.8 acres) compared to the suitable habitat of winter flounder in Barndoor Bay. In a worst case scenario, 1.8 acres containing winter flounder eggs will be adversely impacted. However, this will not result in the complete elimination of winter flounder, as the seasonably available suitable habitat for winter flounder will remain available. Winter flounder are a migratory species that do not utilize this area on a seasonal basis and therefore any adverse effects will be temporary.
The dredging of 1.8 acres of wetlands and subtidal areas will also result in the temporary loss of benthic invertebrates (prey species). However, they will recolonize within a few seasons (Citation: Author, Date). Although the project proposes to fill 1.5 acres of wetlands and subtidal areas, the project sponsor will provide compensatory mitigation in the form of 3.0 acres of created non-tidal wetlands and 0.3 acres of created tidal wetlands for a total of 3.3 acres. Additionally, there are no submerged aquatic vegetation (eel grass) beds located within the project area so there will be no adverse impact to summer flounder HAPC. Finally, the timing of the construction to winter months mitigates any potential adverse impacts to the majority of the listed EFH species.

This paragraph explains the agency’s thoughts on the length of time any effect may last, adverse effects on EFH that may occur after the action, and proposed mitigation to the adverse effects on EFH. The assessment includes the basis of these action agency conclusions and the agency’s response to NOAA Fisheries comment on the mitigation and the agency’s mitigation. NOAA Fisheries can readily review mitigation recommendations and offer any EFH conservation measures back to the action agency, if applicable.

CONCLUSION: Based upon the project design, the minimal short-term impacts associated with the dredging and the extensive mitigation, the “Action Agency” believes that the potential adverse impacts to EFH will be substantial.


The conclusion section describes the agency’s reasoning behind its stated conclusion. However, a clear EFH determination has not been made. A clear conclusion would state: “Based upon the project design, the minimal short-term impacts associated with the dredging and the extensive mitigation, the “Action Agency” believes that the potential adverse impacts to EFH will be substantial.”
This assessment of Essential Fish Habitat (EFH) for the Port of Star City Channel Deepening Project is being provided in conformance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (Title 50, Code of Federal Regulations, Part 600, December 19, 1997). The 1996 amendments to the Magnuson-Stevens Act set forth a number of new mandates for the National Marine Fisheries Service (NOAA Fisheries), eight regional fishery management councils (Councils), and other federal agencies to identify and protect important maritime and anadromous fish habitat. The Councils, with assistance from Federal agencies, are required to delineate EFH for 336 species. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH are required to consult with NOAA Fisheries regarding the potential effects of their actions on EFH and are required to submit the Freshwater Fish Conservation Act, applicable to the proposed Channel Deepening Project is located within an area designated as EFH for the Pacific Council’s Coastal Pelagics and Pacific Groundfish Management Plans.

Proposed Action
The Corps of Engineers in conjunction with the Star City Harbor Department are examining the feasibility of deepening the Inner Harbor channels and turning basins of the Port of Star City to accommodate the most modern vessels in the commercial container fleet. In 1992 the Corps of Engineers approved the Deep Draft Navigation Improvements Project to optimize navigation channels in the Outer Star City Harbor and use the dredge material to create approximately 562 acres of new land (Pier 400). That project is presently under construction. In January 1998, the Port approved the Channel Deepening Project to deepen the Main Channel and associated channels and turning basins from the existing -45 ft. MLLW to -50 ft. MLLW to accommodate new container vessels with a -46 foot draft. Since the approval of this project, new ships in the world container fleet and pending ship orders indicate that container vessels with a draft of -52 feet are being planned which would require a need for navigational channel as deep as -55 ft. MLLW with a two-foot overdraft. As a result, the Corps of Engineers with the Star City Harbor Department as the local sponsor, is conducting a Feasibility Study to determine the federal interest in the deepening of the Main Channel of the Port of Star City to accommodate existing and future commercial container vessels.

Project Objectives
The primary objective of the project is to provide adequate navigational channels for the most modern container vessels that will be calling at the Port of Star City. Secondary objectives include maximizing the beneficial uses of dredge material at the Port of Star City and minimizing the amount of materials for offshore disposal.

Description of the Project
The proposed project would result in dredging between 3.6 and 7.8 million cubic yards (mcy) (2.7 - 6.0 million cubic meters [mcm]) of sediment from the Star City Main Channel, West Basin, East Channel, East Basin and Cerritos Channel. The amount of dredge related material is dependent on the
Example 3. 385 Eel-Drainage Area

The project evaluation process identified through the feasibility analysis, Dredging will cover approximately 415 acres of channel bottom at a depth of -55 ft. MLLW and 210 acres of harbor bottom at depths between -50 ft. MLLW and -55 ft. MLLW. Three depth benchmark and evaluation quantities are provided in Table 1.

Table 1. Alternative channel depths and approximate sediment quantities (mcy).

<table>
<thead>
<tr>
<th>Depth</th>
<th>Clean Coarse Grained</th>
<th>Clean Fine Grained</th>
<th>Contaminated Fine Grained</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>-50 ft. MLLW</td>
<td>1.4</td>
<td>1.9</td>
<td>0.4</td>
<td>3.7</td>
</tr>
<tr>
<td>-53 ft. MLLW</td>
<td>2.2</td>
<td>2.9</td>
<td>0.4</td>
<td>5.5</td>
</tr>
<tr>
<td>-55 ft. MLLW</td>
<td>3.0</td>
<td>4.3</td>
<td>0.5</td>
<td>7.8</td>
</tr>
</tbody>
</table>

*Two additional feet per depth is allowed in each dredging phase.*

The capacity of Channel dredging will be done using an electric hydraulic shovel. Dredging and either electrical or manual power sources. Topsoil will be removed from the dredging area and replaced in the channels and berthing areas.

To accommodate the dredging, up to eight utility crossings of the main channels must be relocated or repositioned prior to completion of the project. A projected length of 40-60 ft. MLLW of shallow water is expected to require a repositioning of 36" Mobil Oil Line, 36" Department of Water & Power (DWP) waterline, a 24" DWP sewer, a 24" Department of Public Works (DPW) sewer force main. These lines will be repositioned in a way that is compatible with the stabilization of the areas to be dredged, and all new force main crossings must be repositioned. Each force main is 10 ft. MLLW, 4 additional utility lines will require repositioned. These are: 10 ft. MLLW sewer force main, 40" sewer force main, and 36" water force crossing.

Channel dredging at project depth will be restricted to areas no closer than 25 feet to the existing pierhead line. The exception will be selected vessel berthing areas which will be dredged to project depth up to the pierhead line. Wharf modifications to these selected vessel berthing areas would consist of installation of up to 12,000 feet of underwater sheetpile bulkhead walls.

Disposal Alternatives

A number of disposal-specific disposal alternatives are being considered either separately or in various combinations depending on the final project and engineering considerations.

1. Pier 300 Expansion Site: This alternative would dispose of between 1.6 and 3.3 mcy of mostly coarse-grained sediments behind a rock dike to an elevation of +17 MLLW. Determination of the size and shape of this fill would be based on the amount of suitable material dredged from the main channel, availability of mitigation to offset the loss of habitat and water quality considerations. This location could also be considered as a confined disposal site for contaminated dredge sediments. The land would be used to conduct an
2. Pier 400 Submerged Storage Site: This disposal alternative would allow in-bay disposal of up to 3.8 mcy of clean dredge material to create a 160-acre submerged fill adjacent to the southeast edge of Pier 400 Stage 2. A submerged dike no higher than -20 MLLW would be used to contain the dredge material. The dredge material would be used as a storage area for future fill material at other sites in the Harbor, as storage for future use, or used to achieve the appropriate final grade on the contracted Pier 400 fills.

3. Pier 400 Upland Site: This alternative would allow for upland disposal of excess clean coarse-grained sediment and would depend on availability of the Pier 400 site. This material would be used as storage for future use, or used to achieve the appropriate final grade on the constructed Pier 400 landfill.

4. Southwest Slip Fill Site: This disposal site has capacity for up to 1.1 mcy of mostly coarse-grained sediment to create approximately 1.6 acres of upland fill material. A submerge dike no higher than -20 MLLW would be used to contain the dredge material. The existing storm drains at the head of the slip would be extended as an open rip rap channel on the north side of the slip. This site could be considered as a confined disposal site for contaminated dredge material. The land would be used as additional backland for the adjacent cargo terminal.

5. Cabrillo Shallow Water Habitat Expansion Site: This submerged site would expand the existing Cabrillo Shallow Water Habitat by approximately 40 acres and be used to dispose of approximately 650,000 cubic yards of mostly coarse-grained sediment. This material would be used as storage for future use, or used to achieve the appropriate final grade on the constructed Cabrillo SWH fill material.

6. Ocean Disposal Sites (LA-2 and/or LA-3): Clean fine-grained/formation material that cannot be taken to other disposal locations will be disposed of at a USEPA-approved ocean disposal site at LA-2 and/or LA-3. This material would be used as storage for future use, or used to achieve the appropriate final grade on the constructed ocean disposal site.

Schedule
Dredging is expected to begin approximately January of 2001 and be completed by July of 2002. What materials would be on going, during and after the dredging project.
Effects of the Proposed Action on EFH


Over 130 species of fish inhabit the Star City Harbor (MEC 1988; COE and LAHD 1992). As a general rule, fish diversity increases as one proceeds into the deeper habitat, especially in the outermost part of the inner harbor. However, fish diversity decreases as one proceeds into the inner harbor, especially into the blind slips. Over the years, there has been an improvement in the water quality and area of the main channel and basins of the inner harbor, which historically were less valuable to fishes because of historical pollution (MEC 1988). An estimate of total fish abundance shows that the outer harbor contains approximately 10 million fish (MEC 1988). Three species, the Pacific sardine (Sardinops sagax), the northern anchovy (Engraulis mordax), and the white croaker (Genyonemus lineatus) make up approximately 90% of the fish in the outer harbor (MEC 1988).

The proposed project is located within an area designated as EFH for two Fishery Management Plans (FMP), the Coastal Pelagics and Pacific Groundfish Management Plans (NOAA Fisheries 1997). Of the 86 species which are federally managed under these plans, twelve are known to occur in the Star City Harbor and could be affected by the proposed project (Table 2).

Table 2. Fisheries management plans (FMP) and managed species affected by the Channel Deepening Project.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal Pelagics FMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern anchovy</td>
<td>Engraulis mordax</td>
<td>Most common species in harbor; adult &amp; larvae present (1, 2)</td>
</tr>
<tr>
<td>Pacific sardine</td>
<td>Sardinops sagax</td>
<td>Abundant species in harbor; predominantly adult (1)</td>
</tr>
<tr>
<td>Pacific mackerel</td>
<td>Scomber japonicus</td>
<td>One of ten species in deeper portions of the harbor (1)</td>
</tr>
<tr>
<td>Jack mackerel</td>
<td>Trachurus symmetricus</td>
<td>One of ten species in deeper portions of the harbor (1, 2)</td>
</tr>
<tr>
<td>Pacific Groundfish FMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pacific hake</td>
<td>Merluccius productus</td>
<td>One of ten species in deeper portions of the harbor (1, 2)</td>
</tr>
</tbody>
</table>
Four of the five species in the Coastal Pelagics FMP are well represented in the Project area. In particular, the northern anchovy is the most abundant species in Star City Harbor, representing over 80% of the fish caught (MEC 1988, 1999), and larvae of the species are also a common component of the ichthyoplankton (MEC 1988). It is generally held that this species spawns outside the harbor. There is a commercial fishery for northern anchovy in the Outer Star City Harbor. The Pacific sardine is at times one of the most common species in the harbor ranking second behind northern anchovy at some locations (MEC 1988). In a recent survey, sardines were a less significant component of the fish caught (MEC 1999). This species is not known to spawn in the harbor, and these species are exported to provide for pelagic fish. Both other Coastal Pelagic species, the Pacific and jack mackerels are considered rare or very abundant in the Project area. The Pacific mackerel’s main forage fish is the harbor fish or very abundant northern anchovy.

Of the seven species present from the Pacific Groundfish FMP, only two, the olive rockfish and the scorpion fish could be considered common in the harbor. The olive rockfish has been found largely as juveniles associated with the kelp growing along the inner edge of the federal breakwater (MEC 1988). The scorpion fish is not a major component of the fish present in the harbor (MEC 1988) but may be underestimated in this catch due to its nocturnal habits.

A direct and cumulative assessment of the effects of similar project activities have been assessed in the Deep Draft Navigation Project EIS/EIR (COE and LAHD 1992) and the Channel Deepening Project EIR (LAHD 1997). Likely project activities that would directly affect the identified FMP species include: deepening of the channels, turbidity caused by dredging activity, suspension of contaminants from the sediments during dredging and sediment disposal, and construction of submerged fill or landfill associated with dredge material disposal (Table 3). Project activities will not have any significant effect on the FMP species that do not occur in the Harbor or are rare or uncommon in the harbor (i.e., English sole, Pacific sanddab, bocaccio and cabezon). The significant effect of the proposed project is the loss of habitat resulting from the construction of...
either 40 or 80 acres of fill in Outer Harbor shallow water at disposal site 1 and 35 acres of Inner Harbor slip habitat at disposal site 4. There is also a potential degradation of water quality in the Pier 300 Shallow Water Habitat as a result of construction of disposal site 1 which would require mitigation.
Table 3. Effects of the proposed project activities on FMP species.

<table>
<thead>
<tr>
<th>Project Activity</th>
<th>Impact Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel Deepening</td>
<td>Deepening of channels from -45 ft. MLLW to -55 ft. MLLW will have no long term effect on FMP species.</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Temporary adverse impact on FMP species resulting in avoidance of considerable area of dredging works and some loss of resident coastal anchorage. Construction would be carried out in accordance with established Waste Discharge Requirements (40 CFR, Part 122).</td>
</tr>
<tr>
<td>Contaminant Suspension</td>
<td>Potential temporary adverse impact to FMP species in immediate area of contaminant dredging. Construction would be carried out in accordance with established Waste Discharge Requirements (40 CFR, Part 122).</td>
</tr>
<tr>
<td>Submerged Fill</td>
<td>Temporary displacement of FMP species with long term benefit resulting from creation of suitable water depth for FMP species.</td>
</tr>
<tr>
<td>Landfill</td>
<td>Significant permanent loss of habitat for some FMP species.</td>
</tr>
<tr>
<td>Utility Crossings</td>
<td>Temporary adverse impact on FMP species resulting in avoidance of immediate area of dredging by adults and some loss of larval northern anchovy. Construction would be carried out in accordance with established Waste Discharge Requirements (40 CFR, Part 122).</td>
</tr>
</tbody>
</table>

Proposed Mitigation

Impacts to water quality associated with dredging activities are considered temporary and would be minimized through implementation of requirements associated with established Waste Discharge Requirements (40 CFR, Part 122). Of the activities identified above, the loss of general marine resources due to construction of landfill disposal sites for dredge material (sites 1 and 4) is considered a significant adverse impact requiring mitigation. The appropriate mitigation has been determined in coordination with National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) through agreed-upon mitigation policy. The goal established in the Deep Draft Navigation Project (COE and LAHD 1992) and elsewhere is “no net loss of in-kind habitat value, where in-kind refers to marine tidal water of value to fish and birds.” Due to the infeasibility of undertaking any significant on-site mitigation except for limited...
creation of shallow water, and the public interest mandate of accommodating maritime cargo
conferred upon the Port by the California Coastal Act, off-site mitigation is allowed between Pt.
Conception and the Mexican border (area of ecological continuity). Implementation of m itigation
measures shall occur prior to or concurrent with project impact. The preferred mitigation is the
restoration of coastal embayment habitat or possibly construction of artificial reefs pending
additional studies on their mitigation value. The habitat valuation performed for evaluating
mitigation opportunities includes marine fish resources and therefore accounts for FMP species
present.

The mitigation proposed for the Channel Deepening Project would include use of mitigation credit
present at the Ports existing Bolsa Chica Mitigation, Outer Harbor Mitigation Bank, and Inner
Harbor Mitigation Bank (Table 4). While there is mitigation available for construction of 88
acres of fill at disposal site 4, there is inadequately enough mitigation available for construction of
the 80 acres of fill at disposal site 1 (Pier 300 Shallow Water Habitat). Any deficit in mitigation would
be made up in accordance with procedures identified in Measure 4D -1 of the Deep Draft Navigation
Project and would be required prior to project construction.

Table 4. Mitigation available for the Channel Deepening Project disposal sites 1 (Shallow Outer Harbor) and
4 (Inner Harbor).

<table>
<thead>
<tr>
<th>Mitigation Bank</th>
<th>Approximate Credits Available</th>
<th>Value in Deep Outer Harbor</th>
<th>Value in Shallow Outer Harbor</th>
<th>Value in Inner Harbor Slips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolsa Chica</td>
<td>75</td>
<td>~64</td>
<td>~64</td>
<td>~47</td>
</tr>
<tr>
<td>Outer Harbor Bank</td>
<td>46</td>
<td>~31</td>
<td>~31</td>
<td>~23</td>
</tr>
<tr>
<td>Inner Harbor Bank</td>
<td>6</td>
<td>n.a.</td>
<td>n.a.</td>
<td>~6</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
<td>116</td>
<td>78</td>
<td>238</td>
</tr>
</tbody>
</table>

* Final values will be available upon confirmation through as-built drawings of Pier 400 and the Cabrillo
Shallow Water Habitat.

** The Pier 300 fill (disposal site 1) may also require expenditure of credits for degradation of the remaining
water area. This will be determined upon receipt of ongoing water quality modeling.

The mitigation provided for above would maintain sustainable fisheries present in the Coastal
Pelagics and Pacific Groundfish FMPs.

The proposed mitigation section identifies the Federal agency’s proposed mitigation
of their action’s adverse effects on EFH and also states the action agency’s
conclusion regarding these actions’ effects on EFH. However, a clear determination
as to the adverse effect on EFH has not been made. A clearly stated adverse effect
determination should be included and would be best if this determination was in
a separate EFH Determination or Conclusion section at the end of the assessment.

Additionally, the action agency is offering its interpretation of sustainability for the
fishery. This offering is not required and is not within the action agency’s expertise
to make this determination. NOAA Fisheries suggests that agencies refrain from this
Page 15 of 31
Example 2: EFH Assessment for abbreviated consultation.

ESSENTIAL FISH HABITAT ASSESSMENT
OILS-R-US PIPELINE PROJECT

August 2004

* Please note that the dates and the names of entities and places mentioned in this EFH assessment example were changed to protect named entities by law.
Example 3: EFH Assessment for expanded consultation.
1.0 INTRODUCTION

The purpose of this document is to present the findings of the Essential Fish Habitat (EFH) assessment conducted for the proposed Oils-R-Us Pipeline Project (ORU Project) as required by the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended through 1996 (Magnuson-Stevens Act). The objectives of this EFH Assessment are to describe how the proposed ORU Project would affect EFH for the area of influence of the project. According to the GMFMC, EFH within the Gulf of Mexico (Gulf) includes all estuarine and marine waters and substrates from the shoreline to the seaward limit of the Exclusive Economic Zone (EEZ). The area of influence of the project would be from Pipestartshere City, South to Endoftheline City, Deep-South.

The EFH Assessment will include a description of the proposed action; an analysis of the direct and cumulative effects on EFH for the managed fish species and their major food sources; our views regarding the effects of the proposed action; and proposed mitigation measures selected to minimize expected project effects if applicable.

2.0 PROJECT DESCRIPTION

Oils-R-Us proposes to construct and operate a pipeline system across the eastern Gulf of Mexico. ORU proposes to construct about 500 miles of various pipeline segments ranging in size from 12” to 36” in diameter. ORU proposes to begin construction in June 2001 and place the system in service by June 2002.

Table 2-1 shows the number of miles of pipeline that would occur along the proposed route in South and Deep-South, and indicates the corresponding pipeline diameter. The total estimated offshore miles of pipeline is 378.2 for federal waters and 58.9 for state waters (South and Deep-South). Offshore miles by state and county are itemized on Table 2-1. Typically, a 200-foot-wide right-of-way (ROW) would be staked out for the permanent right-of-way in all offshore areas, with the pipeline as its center. A total of 9,168.5 acres would be included in that ROW in federal and state waters.

The installation of the offshore portion (defined in this report as offshore to shoreline) of the proposed pipeline system would require site preparation, trenching, directional drilling, pipe fabrication, non-destructive examination, coating of completed welds, pipeline lowering, hydrostatic testing, and dewatering the pipe. In addition, offshore construction would require sandbagging and placement of concrete mats where the ORU pipeline would cross other pipelines and cables. The depth of water in the offshore proposed area varies from approximately zero to 800 feet.

Alignment and profit drawings created from the pre-installation surveys would be used by ORU to identify and locate the offshore portion of the pipeline ROW. The coordinates on the ROW would be tracked by accessing orbiting satellites using Global Positioning System (GPS) equipment installed onboard the pipeline installation vessels. This system may also be used to position the anchors of construction vessels.

Preparation of the offshore pipeline ROW prior to the arrival of the construction equipment for the offshore portion of the project would begin several days to weeks prior to the arrival of the construction equipment. Preparatory work includes dredging of the pipeline route and water exit points. Page 11 of 33
Example 3: EFH Assessment for expanded consultation.

A directional drilling contingency plan and a spread-specific Spill Prevention Containment and Countermeasures (SPCC) Plan specifying the proper procedures for handling any unforeseen spill that might occur would be in place at each location prior to construction.

Table 2-1. Summary of the ORU Pipeline Project

<table>
<thead>
<tr>
<th>State</th>
<th>County</th>
<th>Diameter (inches)</th>
<th>Length (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South</td>
<td>Onshore</td>
<td>36</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>Offshore</td>
<td>36</td>
<td>330.0</td>
</tr>
</tbody>
</table>

Deep-South

<table>
<thead>
<tr>
<th>State</th>
<th>County</th>
<th>Diameter (inches)</th>
<th>Length (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore</td>
<td>36</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td>Offshore</td>
<td>36</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

PROJECT TOTAL

743.2

For directional drills, dredging would be required at the offshore exit point in order to provide adequate transition for the pipeline. Preparation of an underwater pipeline trench along the ROW would be required and the pipeline must achieve sufficient water depth to allow the use of heavy marine equipment. Pre-dredging would be required at certain locations on the pipeline route. The spoil from the dredged trench would be placed on either side of the proposed pipeline route, depending upon prevailing wind and wave conditions. The spoil area would be marked with temporary, lighted pilings, which would be maintained until the dredged trench is backfilled with the spoil material.

The methods of lowering pipelines below the water's surface include mechanical dredging prior to pipeline installation, jetting from a towed or moored vessel, diver hand jetting, and post-plow after laying the pipeline. In federal waters where the water depth is less than 200 feet but more than 40 feet deep, the dynamically positioned post-plow method would be used after the pipeline has been laid on the sea floor and the trench has been backfilled. Diving conditions will be used to decide whether the pipeline is to be handed by a diver, particularly for work around the crossings of existing pipelines. The various combinations of trenching techniques and where they will be used is summarized in Section 2 of the FEIS (Table 2.3.4-1).

ORU selected the proposed pipeline offshore route based on information obtained from field surveys, review of public records, discussions with installation contractors, and consultation with various regulatory agencies and citizen groups. Using sonar and magnetometer equipment, various man-made and naturally occurring features within the proposed offshore pipeline right-of-way were identified. When the installation operation approaches an obstacle which may be deemed sensitive or hazardous, divers, scanning sonar, underwater marking beacons, or ROVs would be employed as required to ensure avoidance of these objects. Acoustic placement of all anchors and anchor cables within the construction corridor would be monitored by GDP.

3.0 ESSENTIAL FISH HABITAT
The 1996 amendments to the Magnuson-Stevens Act set forth a mandate for NOAA Fisheries, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained. EFH in the project area of interest is identified and described to include the stage of development, location, and level of productivity of the habitat. It is essential to ensure that suitable fishery habitats are maintained. EFH are identified and described for various life stages of 26 managed fish, shellfish, and a coral complex commonly occur (GMFMC, 1998). A provision of the Magnuson-Stevens Act requires that FMC's identify and protect EFH for every species managed by a Fisheries Management Plan (U.S.C. 1853(a)(7)). There are FMP's in the Gulf region for shrimp, red drum, reef fish, coastal migratory pelagics, stone crabs, spiny lobsters, coral and coral reefs, and highly migratory species (e.g., billfish, swordfish, tuna, and sharks). Table 3-1 presents the EFH along the proposed route of the ORU Pipeline Project in State and Federal waters.

EFH is separated into estuarine and marine components. The estuarine component is defined as "all estuarine waters and substrates (mud, sand, shell, rock and associated biological communities), including the main-tidal vegetation zones and separate and adjacent inter-tidal vegetation (grasses and algal). The ORU Pipeline Project crosses estuarine systems in Big River Sound, Bayou Matthew, and Bayou Luke, and again within EndoftheLine Bay. Estuarine fishery species that inhabit the estuary for part of their life cycle and are commonly associated with seagrass beds, oyster reefs, and unvegetated soft bottom habitats. The marine component is defined as "all marine waters and substrates (mud, sand, shell, rock, hard bottom, and associated biological communities) from the shoreline to the seaward limit of the Exclusive Economic Zone" (GMFMC, 1998).

The discussion that follows is arranged by areas according to the progression along the proposed pipeline from Big River/South to Federal OCS waters, to Deep-South State waters.

<table>
<thead>
<tr>
<th>Fishery Management Unit</th>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shrimp Fishery</td>
<td>brown shrimp</td>
<td>Penaeus aztecus</td>
</tr>
<tr>
<td></td>
<td>white shrimp</td>
<td>Penaeus setiferus</td>
</tr>
<tr>
<td></td>
<td>pink shrimp</td>
<td>Penaeus duorarum</td>
</tr>
<tr>
<td>Red Drum Fishery</td>
<td>red drum</td>
<td>Sciaenops ocellatus</td>
</tr>
<tr>
<td>Reef Fishery</td>
<td>red grouper</td>
<td>Epinephelus morio</td>
</tr>
<tr>
<td></td>
<td>yellowtail snapper</td>
<td>Ocyurus chysurus</td>
</tr>
<tr>
<td></td>
<td>Tilefish</td>
<td>Lopholatilus chamaeleonticeps</td>
</tr>
<tr>
<td></td>
<td>gray trigger fish</td>
<td>Balistes capriscus</td>
</tr>
<tr>
<td>Spiny Lobster Fishery</td>
<td>spiny lobster</td>
<td>Panulirus argus</td>
</tr>
</tbody>
</table>
| Coral and Coral Reefs   | coral reef complex         | More than 500 species of fish have been reported in the Federal waters of the OCS in the Gulf. Common fish species found in the federal waters adjacent to the ORU Pipeline Project can be characterized as coastal pelagic, reef associated, and oceanic pelagic (MMS, 1999). Table 3-1 presents the EFH along the proposed route of the ORU Pipeline Project in State and Federal waters.
major coastal pelagic species are listed in the FEIS (Table 4.6.1). Reef fishes range from shallow estuaries to more than 500 miles offshore, and occupy both pelagic and benthic habitats during their life cycle. The most common species occurring over the project track include groupers, snappers, damselfishes, and gobies (Smith, 1976). Pelagic species occur in open ocean areas of the Gulf, especially at or beyond the shelf edge, and can occasionally occur in shelf waters. Oceanic pelagic species tend to occur in areas of high productivity (e.g., advection of nutrient-rich waters or upwelling) (MMS, 1999). Common predatory pelagic fish species include tunas, swordfish, marlins, sailfish, dolphins, wahoo and mako sharks (MMS, 1999).

This is a good table and lists which Federally managed species’ EFH is described and identified in the action area.

4.0 MANAGED FISH SPECIES

The seasonal and year-round locations of designated EFH for the managed fisheries are depicted on the figures available on the NOAA FishMaps web page (http://galveston.ssp.nmfs.gov/efh, and http://christensenmac.nos.noaa.gov/Gulf-Files). The EFH determination is based on species distribution maps and habitat association tables. In estuaries, the EFH of each species consists of those areas described as “common,” “abundant,” and “highly abundant.” In offshore areas, EFH consists of those areas described as “adult areas,” “spawning areas,” and “nursery areas.” We reviewed the maps for species under the management of the GMFMC, and made a determination of potential impacts to the selected species according to the indicated abundance within the project area.

4.1 ECOLOGICAL NOTES ON THE EFH FISHERIES AND SPECIES

A brief summary of ecological information was compiled from the NOAA Fisheries’ EFH webpage (http://galveston.ssp.nmfs.gov/efh) and http://christensenmac.nos.noaa.gov/Gulf-Files, and from National Oceanic and Atmospheric Administration’s “Estuarine Living Marine Resources Project” (Williams et al., 1990). Especially sensitive areas (followed by the season or months of peak sensitivity) such as “spawning area” or “nursery area” are given for species where the description might help in mitigating impacts with a seasonal condition on construction activities.

Brown Shrimp

Brown shrimp are generally more abundant in the central and western Gulf and found in the estuaries and bays. During the reproduction season, adults move into the estuaries to spawn. Postlarvae and juveniles are associated with estuarine vegetation and also found over sandy and non-vegetated mud flats. In Delta South, adult areas are primarily west of End of the Line Bay, and associated with mud, muddy sand, and sandy substrates. Spawning areas: inner zone of Big River and South from river mouths, Deep South waters to edge of the continental shelf. Year round.

Nursery area: Big River Sound and major nursery areas End of the Line, Bay

White Shrimp

Nursery areas: Deep South waters to edge of the continental shelf, year round.

Water Shrimp

Page 22 of 33
White shrimp are offshore and estuarine dwellers, and are pelagic or demersal depending on their life stage. In the Gulf, white shrimp are found in varying depths depending on the spawning season and nursery areas. The eggs are demersal and larval stages are planktonic, and both occur in nearshore marine waters. Postlarval white shrimp become benthic upon reaching the nursery areas of estuaries, seeking shallow water with muddy-sand bottoms that are high in organic detritus. Adult white shrimp are demersal and generally inhabit nearshore, shallow waters. In the Deep South, white shrimp are more common near south or south-east of Sanibel Island (Williams et al., 1989).

**Spawning area:** Off Big River and South; March to October

**Nursery area:** Big River Sound

**Pink Shrimp**

Juvenile pink shrimp spend most of their time in the Gulf but are most abundant in Deep-South estuaries where they occur in higher densities. During the postlarval stage, pink shrimp are pelagic and may migrate to different areas and depths as they mature. Pink shrimp generally inhabit nearshore marine waters. In Deep-South, pink shrimp are not common east or south of Gazuntight Bay (Williams et al., 1990).

**Spawning area:** Off Big River, South and Deep-South offshore; year round

**Nursery area:** major nursery areas in EndoftheLine and Deep-South coast state waters; summer and fall in the northern Gulf

**Red Drum**

In the Gulf, red drum spawn in a variety of habitats, ranging from depths of about 100 feet offshore to very shallow estuarine waters. They commonly occur in all of the Gulf's estuaries where they are associated with a variety of substrate types including sand, mud, and oyster reefs. Red drum are important as a sport fish and as a commercial species. They are abundant in the Gulf, and populations are estimated to be about 200 million. The Gulf shelf is an important habitat for juvenile red drum. Juvenile red drum are most abundant in shallow water, and adults are most abundant in deeper water near the mouths of bays and inlets, and on the Gulf side of the barrier islands. The EndoftheLine Bay EFH estuarine map shows red drum juveniles to be abundant or highly abundant in the fall and winter and common in the spring and summer.

**Spawning area:** Gulfwide from nearshore to just outside state waters; fall and winter

**Nursery area:** major bays and estuaries including Ambulatory Bay and EndoftheLine Bay; year round

**Red Grouper**

The red grouper is a long-lived and occurs throughout the Gulf of Mexico from depths of 10 to about 400 feet preferring 100 to 150 foot depths. Juveniles are associated with inshore hard-bottom habitat, and adults are associated with deep-water hard-bottom habitat, and reefs. In the Deep South, red drum are not common near south or south-east of Sanibel Island (Williams et al., 1989).

**Spawning area:** Off Big River and South; March to October

**Nursery area:** Big River Sound

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distribution maps show that spawning for this species occurs throughout much of the OCS area, but occurs at least annually in the Deep-South continental shelf. Nursery areas occur along the entire pipeline route in OCS waters.

**Distribution of Red Grouper**

- **Spawning areas**: Deep-South continental shelf, well offshore, extending from south of Blessyou Bay to west of the Deep-South Keys; April to May
- **Nursery areas**: Extensively throughout the continental shelf off Deep-South and along the northern Gulf of Mexico coast; year-round

**Yellowtail Snapper**

- **Juvenile distribution**: Nearshore nursery areas over vegetated sandy substrate and in muddy shallow bays (NOAA 1985).
- **Habitat**: Thalassia beds and mangrove roots preferred habitat of the gray snapper. Late juvenile and adults prefer similar water areas. According to the Gulf distribution map, this species has nursery areas within the 3 League Line and EndoftheLine Bay. Spawning and adult areas occur in OCS areas outside of the 3 League Line through the Deep-South middle ground and southern Blessyou areas. EFH is not designated in the state waters of Big River or South.

- **Spawning area**: West and north of EndoftheLine Bay including half of the proposed pipeline route; spring and summer
- **Nursery area**: Throughout the western and southern coast of Deep-South, including EndoftheLine Bay

**Tilesfish**

- **Spawning area**: Throughout the deeper waters of the Gulf. According to the species distribution map, about one-third (140 miles) of the proposed pipeline narrowly infringes on its designated EFH.
- **Nursery area**: Year-round throughout the adult area

**Gray Triggerfish**

- **Larval and juvenile**: Associated with seagrass (Sargassum) and mangrove estuaries. Adults seem to prefer offshore areas associated with reefs. A general species distribution map was not available; however, a map showing catches per hour by trolling methods within the Gulf was available from the National Oceanic and Atmospheric Administration Southeast (SEA), at the EFH web page.

- **Spawning area**: EFH map not available; assumed to be adult preferred areas offshore

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*Page 34 of 35*
Nursery area: EFH map not available; assumed to be estuarine areas throughout the Gulf

Spiny Lobster

The principal habitat for the spiny lobster is offshore reefs and seagrass. Spiny lobsters spawn in offshore waters along the deeper reef fringes. Adults are known to inhabit, legends, estuaries, and shallow banks. According to the species distribution map, spiny lobsters use the lower half of EndoftheLine Bay for nursery areas. According to the GMFMC, EndoftheLine Bay seems to be the upper limit for spiny lobster abundance due to the higher salinities found south of the Bay. The EndoftheLine Bay-specific distribution map indicates that spiny lobsters in the Bay are rare. However, the Gulf distribution map indicates that EndoftheLine Bay is used as an adult nursery area and as a nursery area. Spiny lobsters known to occur in northern and western Gulf habitats.

Spawning area: throughout the adult areas, particularly north and south of EndoftheLine Bay. March to July

Nursery area: lower half of EndoftheLine Bay used as nursery year-round

Coral and Coral Reefs

The three primary areas in the Gulf where corals are concentrated are the East and West Flower Garden Banks, the Deep-South Middle Grounds, and the extreme southwestern tip of the Deep-South Reef Tract. No coral reefs exist along the proposed pipeline corridor. No coral reefs would be affected by this project.

5.0 ASSESSMENT OF IMPACTS AND MITIGATIVE MEASURES

In this section, potential impacts to managed species and EFH are examined. Identifiable impacts generated by the proposed action for the estuarine and marine components of the EFH are described. Potential environmental consequences that may result from impacts to EFH are reviewed, as well as the mitigative measures that would be taken by ORU to prevent or minimize impacts to essential fish habitats, when applicable.

5.1 IMPACTS TO EFH

Impacts to EFH components are expected, since the ORU Pipeline Project would traverse state and federal waters for approximately 350 miles. There is concern for the diversity of EFH habitats that would be crossed, and the presence of two important resource areas: (1) A-1 spawning area and (2) hard bottom habitats (live bottom) within state and offshore.

5.1.1 Impacts to the Estuarine Component of the EFH
Coastal estuarine fisheries of the project area of influence would be crossed. The Gulf supports extremely valuable commercial and recreational fisheries in state and Federal waters. However, the potential impacts to fisheries would be negligible. Most species of demersal and pelagic finfish would avoid construction zones. Potential impacts to commercial fishing would be temporary and minor since fish would quickly re-colonize after construction. The increase in sediment loads during pipeline construction would be temporary and would not remain on the ocean floor. That any impacts from sedimentation or turbidity would be minor.

Sedimentation and Turbidity

It is anticipated that most species of demersal and pelagic finfish species would avoid construction areas, and that potential impacts would be temporary and minor resulting in the displacement of, followed by rapid post-construction re-colonization by these species. Sedentary demersal fishes may be affected by the temporary increase in sediment loads within the water column during construction. Deposition of suspended sediments can smother demersal eggs and larvae. Although impacts from pipeline construction may result in considerable mortality to eggs and larvae in areas where the proposed pipeline would be trenched and dredged, the impacts on populations would be minor since spawning occurs over broad areas. In addition, these impacts would be expected to occur only in areas where jetting would be used to install the pipeline below the water surface.
Because the post-plow method would be used to lower the pipe in all waters deeper than 40 feet, jetting would be restricted to portions of the pipeline route with water depths less than 40 feet. Shellfish larvae are particularly sensitive to increases in suspended material in the water column, however, impacts would be minimized by scheduling construction activities to avoid the spawning season. Impacts to shellfish populations would also be minimal due to the extensive range of these organisms. Indirect effects resulting from the displacement or mortality of benthic prey organisms should be temporary since most organisms are expected to quickly recolonize disturbed areas.

Anchor Scars, Cable Sweeps, Trenching and Pipelay

An additional source of impacts to benthic fauna or disruption of the benthic habitat structure is the placement of anchors for the pipe lay-barge. There are two components of the impact - the actual anchor scar from the footprint impact of an anchor each time it is set, and the scraping or sweeping of the sea bottom from the movement of the anchor cables across the sea bottom (called cable sweep), as the forward anchor arrays are winched in and the aft anchor arrays are played out. The area footprint of the anchor scar is fairly small, but the depression can be as deep as 7 to 8 feet. Also, due to the weight of the anchor and the depth of the scar, the effect on live bottom would be complete mortality within the footprint of the scar, with impact and recovery being long term. On the other hand, the area is affected by cable sweep is expected to be relatively small compared per unit area affected in the area of cable sweep, due to limited areas of cable sweep. Slight areas of bottom would soon recover, while the areas of bottom affected would be limited to areas of anchor or cable sweep.

A study of anchor scar effects for the size barges that will be used on this project predicts an average anchor area of about 360 square feet (10 feet by 36 feet). With an average 12-anchor array, and resetting the anchors twice per mile creates 24 anchor scars per mile. Allowing for a single pass in shallow waters and a triple pass for some segments of the pipeline, the study calculated 4,325 anchor scars in a 180-mile section (total distance within the MMS OCS Low Relief Live Bottom Stipulation area) of the offshore pipeline, or 31.8 acres of sea floor impact. Using the proportion of live bottom (range from zero percent to 28 percent for the five areas studied in the Live Bottom Stipulation area, see Figure 4.6-1) to total bottom, this amounts to 4.1 acres of live bottom impact.

As originally proposed by ORU, the largest single source of impact to the benthic community would be cable sweep. Under the initial construction plan, ORU calculated a total sea floor impact of 43,498 acres in federal waters, of which 5,534 acres would be live bottom habitat. However, since the DEIS was released, ORU has committed to two construction modifications that would greatly reduce the impacts of cable sweep to the sea bottom and to live bottom habitat. The first change was the adoption of the use of the post-plow lowering method for waters deeper than 40 feet, a change that negates the need for use of dynamic positioning systems on the wire-laying barges. According to ORU, this would result in a 32 percent reduction in sea floor impact, and a 71 percent reduction in live bottom habitat impact. In addition, ORU reported that ORU has committed to a second construction modification that would greatly reduce the impacts of cable sweep to the sea bottom and to live bottom habitat. The first change was the adoption of the use of the post-plow lowering method for waters deeper than 40 feet, a change that negates the need for use of dynamic positioning systems on the wire-laying barges. ORU states that the second change consists at a series of features at the anchor points and stock that limit the spread of spoil. No such features are included in the potential impacts associated with anchoring, which are therefore not relevant to this methodology. According to ORU, this reduction would result in a 51 percent
Other impacts to the sea bottom community include the area of impact to benthic communities directly on the sea bottom (wider than 200 feet), the area of direct burying by the post-plow. The area affected directly by post-plowing is the assumed width of the top of the trench, or 25 feet wide plus the area affected by re-deposition of sediments on either side of the trench. According to ORU's surveys, post-plowing will affect approximately 65 acres of impacted rock sea bottom. The summation of these post-plow lowering, excavation, re-deposition, and pipelay impacts is given in the calculations.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Water Depth Range</th>
<th>Sea Floor Impacts (acres)</th>
<th>Subtotal (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipelay on the Sea Floor</td>
<td>&gt;200</td>
<td>28.7</td>
<td>3.4</td>
</tr>
<tr>
<td>Trenching Direct (Post-plow)</td>
<td>3 League Line to 200</td>
<td>4.0</td>
<td>198.6</td>
</tr>
<tr>
<td>Anchor Scarring</td>
<td>3 League Line to 420</td>
<td>1.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Anchor Cable Sweep</td>
<td>3 League Line to 420</td>
<td>67.1</td>
<td>254.0</td>
</tr>
<tr>
<td>Total Direct Impact Subtotal</td>
<td></td>
<td>1,160.5</td>
<td>532.3</td>
</tr>
</tbody>
</table>

Potential for Offshore Oil Spills

Another category of impacts to marine and estuarine fish and wildlife is the potential for accidental spills of petroleum products and fuel during pipeline construction. These spills could originate from: accidental spills from construction barges or support boats, loss of fuel during fuel transfers, or accidents resulting from collisions. Construction of the pipeline on Federal and State waters will involve a significant amount of work activity aboard vessels, and the movement of pipeline lay barges, support vessels, and other specialized marine equipment. ORU and their construction contractors must comply with all laws and regulations related to handling of fuels and lubricants, including 40 CFR part 110, and related to vessel-to-vessel transfers, including 33 CFR part 155.

Other potential effects of construction include destruction of habitat, removal of structure, and fish mortality from accidental fuel spills. Construction of the pipeline may result in destruction of physical habitat or structure. ORU would implement the containment and clean up measures outlined in its SPCC Plan in the event of any spill or release.

5.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION
Coastal and Marine Environmental Degradation

The degradation of coastal and marine EFH habitats is associated with the following:

- temporary disturbance and displacement of fish species;
- increased sediment loads and turbidity in the water column;
- temporary loss of food items to fisheries;
- limited disruption or destruction of live bottom habitats;
- limited sediment transport and re-deposition; and
- temporary degradation of the water quality due to construction activities (e.g., trenching, trimming, trenching, piling, impact, discharge of HDD drilling mud).

Most of the above effects are temporary, and would be offset by special construction techniques or water quality protection during grouting, or are negligible considering the localized effect of the activities conducted to the area of the Gulf that would be unaffected. In this sense, the coastal and marine environmental degradation would be to high environmental sensitivity effects and negligible effects on the marine EFH habitat to occur.

The EFH impact mitigation measures for the ORU Pipeline Project are summarized below in Table 5-2. Impacts are listed by type and nature (i.e., significance of effects). Impacts are considered direct, indirect, temporary, short-term, long-term, permanent, and/or cumulative.

### Table 5-2. Summary of Potential Impacts to EFH by Impact Type

<table>
<thead>
<tr>
<th>Type of Impact</th>
<th>Temporary</th>
<th>Short Term</th>
<th>Long Term</th>
<th>Permanent</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery Days to Weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-plow Lowering*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Barge Anchoring*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Pipelay on Seafloor (trenched; &lt;200 ft deep)*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Pipelay on Seafloor (not trenched; not buried)</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Sedimentation/Turbidity</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Disruption of Live Bottoms/Hard Substrate*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Disruption of Live Bottoms/Soft Substrate*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Seafloor Area Occupied</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Epifauna/Infauna Destruction*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Fish Fauna Disruption Species</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Fish Fauna Disruption Habitat</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
<tr>
<td>Reduction Water Quality/Spills, Mud discharges*</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
<td>ü</td>
</tr>
</tbody>
</table>

**Direct Impacts**

Full recovery could take up to 3 years.

Indirect Impacts
The environmental consequences of the proposed action section 5.2 summarizes the federal agency’s potential impacts. Table 5.2 is particularly useful in illustrating the degree that each action impacts certain habitats and fish species. Note the term significant in paragraph 2 should be substituted with the EFH guidelines term substantial.

5.3 PROPOSED MITIGATIVE MEASURES AND GUIDELINES FOR EFH PROTECTION

GMFMC developed guidelines that, if incorporated into project plans, would minimize impacts to various fishing and non-fishing related activities. Listed below are the guidelines specifically developed for installation associated with installation of submerged pipelines (GMFMC, 1998) that would be implemented by ORU during the development of the project.

- Crossing will be aligned along the least environmentally damaging route. Environmentally critical habitats such as submerged aquatic vegetation, oyster reefs, emergent marsh, sand and mud flats, and endangered species habitats should be avoided.

- ORU will use horizontal directional drilling for all coastal landfall approaches. This technique will allow ORU to avoid sensitive and mangrove communities in #1Delineate the Bay. ORU has been proactive in avoiding construction of permanent access channels. Project specific conditions were given in the placement of sub valves and horizontal directional drilling to determine volume of dredging for given turbidity zones. Special construction techniques (e.g., push ditch method) will be considered for any pipeline installation involving sensitive wetlands (e.g., Big River).

- Excavated materials will be stored and contained on uplands. If storage in wetlands or waters cannot be avoided, alternating stockpiles should be used to allow continued sheet flow. Stockpiled materials should be stored on construction cloth rather than bare marsh surfaces, seagrasses, or reefs.

- Pipelines and submerged cables will be buried and maintained below the water bottom.

- If seagrasses or oyster reefs occur at or near the project site, ill-tinated or another type of barrier will be used to reduce turbidity and sedimentation. Special efforts should be made to avoid placement of exit holes adjacent to seagrass beds or oyster reefs.

- ORU has avoided oyster reefs and seagrass beds through pipeline alignment design and use of horizontal directional drilling.

- ORU has delineated areas such as wetlands, during the application process. Control of activities on sensitive areas will be one of the tasks performed by the environmental monitors.

- Pipeline and production structures, including pipelines, generally should not be located within 1 mile of the base of a live reef.

- High or low relief live bottoms that could not be avoided have been identified and quantified in this report and in the FEIS, Section 5.6.2 (see table 5.6-1).

- Relocation of operations including pipelines away from essential fish habitats in bermuda.

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Example 3: EFH Assessment for expanded consultation.

and possible monitoring to assess the impact of the activity on the live bottoms.

- Buried pipelines will be examined periodically for maintenance of adequate earthen cover. This approximates 16 percent of the total area surveyed for bottom type from the Deep-South Three League Line throughout the OCS Live Bottom Lease Stipulation areas. However, on the inner Deep-South Shelf (i.e. the 24.2 miles surveyed west of the Three League Line) the proportion of live bottom was 47 percent of the area surveyed. The total area of bottom types and hard bottom areas, including both live bottom and hard bottom (i.e. the portion of live bottom that may support the growth of hard corals), is approximately 535 acres. This is a conservative, approximate (40 percent, or about 11,103,880 acres) of the West Deep-South Shelf from Lockville to Racetown has been categorized as “live bottom habitat”, including rocks, corals and sponges (Parker et al., 1983).

6.0 CONCLUSIONS

Despite efforts to avoid live bottom habitats and shore edge hard banks, the selected route traverses 28.8 miles of live bottom habitat and 0.5 mile of hard bottom habitat. This approximates 16 percent of the total area surveyed for bottom type from the Deep-South Three League Line throughout the OCS Live Bottom Lease Stipulation areas. However, on the inner Deep-South Shelf (i.e. the 24.2 miles surveyed west of the Three League Line) the proportion of live bottom was 47 percent of the area surveyed. The total area of bottom types and hard bottom areas, including both live bottom and hard bottom (i.e. the portion of live bottom that may support the growth of hard corals), is approximately 535 acres. This is a conservative, approximate (40 percent, or about 11,103,880 acres) of the West Deep-South Shelf from Lockville to Racetown has been categorized as “live bottom habitat”, including rocks, corals and sponges (Parker et al., 1983).

The remainder of the marine segment of pipeline will include the soft bottom habitat across 607 miles (40 percent of the site) of the 800 mile pipeline route. Thus the selected route again includes approximately 16 percent of the total area of live bottom on the West Deep-South Shelf. Despite this, the offshore pipeline route mitigates the impacts to these areas temporarily, stabilizes them, and allows recovery prior to project completion in order to avoid the impact on live bottom habitat. This positive aspect of the project design, impacts to such habitats are judged to be short term since recovery can occur in a time frame of months to two years.

Some impacts to EFH are recognized as permanent (i.e., trenching through the bottom habitat), since full recovery can require up to 30 to 50 years. This example of a permanent impact is the change of bottom type from natural sediment to the artificial substrate of the pipeline itself. This is a small area where the pipeline will not be lowered below the mudline but will be laid on the seafloor.

In contrast, to some long term and permanent impacts to EFH, the direct impact on the EFH managed species would be largely temporary. This is because the primary impact directly to the fish themselves is the temporary impairment of water quality due to high turbidity and suspended solids concentrations during dredging in shallow water (less than 40 feet deep) or post-plow lowering in deeper water (greater than 40 feet deep). Most adult fish are mobile and will actively avoid direct impacts from the pipe laying and trenching activities. Some impairment of ability of EFH managed species to find prey items could occur, but this effect should be temporary and spatially limited to the immediate vicinity of pipeline construction activities.

This conclusion is good in that it concludes there may be some temporary and permanent effects. However, this doesn’t clearly state whether or not there are any adverse effects to EFH. The conclusion would be better to include a clearly stated EFH adverse effect determination.

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REFERENCES/LITERATURE CITED


Example 3: EFH Assessment for expanded consultation.