Preparing Essential Fish Habitat Assessments: A Guide for Federal Action Agencies

Version 1

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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 Section 305(b(2)-(4)) of the Magnuson-Stevens Act. As part of the EFH Consultation process, the guidelines require Federal action agencies to prepare a written 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 managed species' contribution to a healthy ecosystem (50 CFR 600.10).

Healthy ecosystem means an ecosystem where ecological productive capacity is maintained, diversity of the flora and fauna is preserved, and the ecosystem retains the ability to regulate itself. Such an ecosystem should be similar to comparable, undisturbed ecosystems with regard to standing crop, productivity, nutrient dynamics, trophic structure, species richness, stability, resilience, contamination levels, and the frequency of diseased 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, benthic 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)).

FREQUENTLY ASKED QUESTIONS

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 Federally managed fish species. An EFH Assessment, either detailed, and referenced as such, in an existing environmental document (EA or EIS) or as a stand alone EFH Assessment, is the beginning of a cooperative exchange of information assessing any affects to EFH and offers ways to minimize any adverse effects. Additionally, this information is necessary for NOAA Fisheries to fulfill its statutory responsibility to provide EFH conservation recommendations to minimize adverse effects of any proposed action.

This 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 their 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 impact 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 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 consultation, 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 Assessment was prepared for that previous action, the Federal agency may incorporate by reference the completed EFH Assessment and supplement it with any relevant new project specific information. The old 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 is representing one or more additional agencies. Alternatively, if one Federal agency has completed an EFH consultation for an action and another Federal agency acts separately to authorize, fund, or undertake the same activity (such as issuing a permit for an activity that was funded via a separate Federal action), the completed EFH consultation and associated EFH Assessment may suffice for both Federal actions if the consultation adequately addresses the adverse effects of those actions on EFH.

Where is EFH and what are the species?

NOAA Fisheries' authority to manage EFH is directly 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 life 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 via the internet at 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 within 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 affects 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)(3):

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, 500 ft^3 sediment removed)?

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 this 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 impact? *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:

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 contained 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.

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. Project includes the excavation of 1.8 acres of waters of the United States including wetlands for boat basin and channel creation. Basin to be dredged to -6.0 MLW and channel to -7.5 MLW; filling of 1.5 acres of waters of the United States including wetlands associated with bulkhead for boat basin, parking lot, roadways, walkways, 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 to NOAA Fisheries that the action agency is taking necessary steps to satisfy EFH requirements. This also 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 only apparent exception to this is winter flounder which spawns in the estuary, generally from February through June.

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 those species. Winter flounder, however, spawn during the months that dredging and boat basin construction will be occurring. Since winter flounder lay demersal eggs, there is a potential that the construction activities will adversely impact eggs in the proposed areas of disturbance. Since adults and juveniles are mobile, it is expected that they will avoid the areas of disturbance and therefore will not be impacted. The area of winter flounder EFH disturbance is relatively small scale (1.8 acres) compared to the suitable habitat available to winter flounder adjacent to the project site within

Barndoor Bay. In a worst case scenario, 1.8 acres containing winter flounder eggs will be adversely impacted for one season. The affected area would be available for deposition of winter flounder eggs in subsequent years after the dredging activities are completed.

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 action 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 for the adverse effects on EFH. This assessment could be improved by separating these sections, especially the mitigation offering. By doing so, 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 not be substantial.

REFERENCE: Author, Date. Title. Journal, Book, Report, EFH Assessment. Pages.

> ***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 <u>there will not be any adverse effects to EFH</u>"***

EFH Assessment Example No 2.

Essential Fish Habitat Assessment
for the Port of Star City Channel Deepening Project

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 (see FR 62, 244, 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 marine and anadromous fish habitat. The Councils, with assistance from NOAA Fisheries, are required to delineate EFH for all managed 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 respond in writing to the NOAA Fisheries' recommendations. 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 material is dependent on the approved project depth identified through the feasibility process. Dredging will cover approximately 670 acres of harbor bottom. For Feasibility purposes, depths are being considered in one foot increments between -50 ft. MLLW, and -55 ft. MLLW. Three depth scenarios and sediment quantities are provided in Table 1.

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

Depth*	Clean Coarse Grained	Clean Fine Grained/ Formation	Contaminated Fine Grained	Total
-50 ft. MLLW	1.4	1.9	0.4	3.7
-53 ft. MLLW	2.2	2.9	0.4	5.5
-55 ft. MLLW	3.0	4.3	0.5	7.8

*Two additional feet of over depth is allowed for in each dredging depth.

The majority of channel dredging will be done using an electrified hydraulic dredge. Berth and utility work and removal of any contaminated sediments may require other types of dredges (e.g., clamshell dredges) and power sources. Dredging is tentatively scheduled 24 hours per day.

To accommodate the dredging, up to eight utility crossings of the main channels must be relocated or removed prior to completion of the project. At a project depth of -52 ft. MLLW or shallower these include the removal of a 36" Mobil Oil Line, a 20" Department of Water & Power (DWP) waterline, a DWP power line, a 30" Department of Public Works (DPW) sewer force main. These lines will be replaced with a 24" DWP waterline crossing by directional drilling, a new power line crossing by directional drilling, and a 30" sewer force main crossing by microtunneling. If dredging is to -55 ft. MLLW, three additional utility lines will require relocation. They are: 2-20" sewer force main crossings, a 30" sewer force main crossing, and a 24" waterline crossing.

Channel dredging to project depth will be restricted to an area no closer than twenty-five 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 dredge material disposal alternatives are being considered either separately or in various combinations depending on the final proposed project and design considerations.

1. Pier 300 Expansion Site: This alternative would dispose of between 1.4 and 3.3 mcy of mostly coarse grained dredge material to create 40 to 80 acres of new land in the western portion of the Pier 300 Shallow Water Habitat. Dredge material would be placed 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 material. The land would be used to construct an additional berth and backland area for the adjacent container terminal.

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 submerge 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, or would be left in place as a base for construction of a fill that would expand Pier 400.

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 15.4 acres of constructed behind a rock dike. 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 cy of clean, nonstructural quality dredge material (fine grain) with a sand cap. The material would be entrained behind a submerged dike on the north side, the existing Cabrillo SWH submerged dike on the east and reclined to the -20 MLLW contour on the West and South. This site would allow disposal of fine-grained material that otherwise would be disposed of at an ocean disposal site.

6. Upland Disposal Site: Fine grained dredge material unsuitable for Ocean Disposal and not placed in a confined disposal site (see above) would be placed at an approved upland storage site within the Harbor District such as at Anchorage Road site. This is currently estimated at up to 400,000 cubic yards. Contaminated dredge material would be placed on an adjacent backland and dewatered prior to trucking to the upland site, or placed in a barge and towed to the upland
site.

7. 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 (LA-2 and/or LA-3). Project construction could generate up to approximately 4.8 mcy of

clean fine-grained/formation material.

Schedule

Dredging is expected to begin approximately January of 2001 and be completed by July of 2002. Wharf upgrades would be on going, during and after the dredging project.

Effects of the Proposed Action on EFH

The ichthyofauna in the area of the proposed project has been extensively studied (Soul and Oguri 1976, 1980; Chamberlain 1973; Long Beach Harbor Consultants 1976; Horn and Allen 1981; Brewer 1976; Atlantis Scientific 1979; Ware 1979; Southern California Ocean Studies Consortium 1980, 1982 (81,83?); Star City Harbor Department 1981, 1984; MBC Applied Environmental Sciences 1974, 1980, 1988; Reish 1971, Environmental Quality Analysts and Marine Biological Consultants 1978; Hill and Reish 1975; Lio 1981; MEC Analytical Systems Inc., 1988, 1999). The most recent comprehensive studies are those of MBC (1984) and MEC (1988). Recently, studies for the Channel Deepening Project were conducted by MEC (1999) to compare various habitats in the Outer Star City Harbor.

Over 130 species of fish are found in the Star City Harbor (MEC 1988; COE and LAHD 1992). As general rules, the abundance of fish within the federal breakwater is higher than outside the breakwater and the diversity and abundance of fish decline as one proceeds into the Inner Harbor, especially into the blind slips. Over the years, there has been an improvement of the harbor's water quality and areas in the main channels and basins of the Inner Harbor, which historically were less valuable to fishes, have become more like areas of the deep Outer Harbor (MEC 1988). An estimate of total fish abundance shows that the Outer Harbor contains, at any one time, approximately 15 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.

Common Name	**Scientific Name**	**Comment**
Coastal Pelagics FMP		
Northern anchovy	*Engraulis mordax*	Most common species in harbor; adult & larvae present (1, 2)
Pacific sardine	*Sardinops sagax*	Abundant species in harbor; predominantly adult (1)
Pacific mackerel	*Scomber japonicus*	One of top ten species in deeper portions of the harbor; adult (1)
Jack mackerel	*Trachurus symmetricus*	One of top ten species in deeper portions of the harbor; adult (1,2)
Pacific Groundfish FMP		

English sole	*Parophrys vetulus*	Rare; adult; 1of 30,733 fish caught in trawl (1)
Pacific sanddab	*Citharichthys sordidus*	Rare; adult; 1 of 30,733 fish caught in trawl (1)
Leopard shark	*Triakis semifasciata*	Uncommon; adult; 1 of 20,184 fish caught in beach seines (1)
Bocaccio	*Sebastes paucispinis*	Uncommon; juvenile in kelp around breakwater (1)
California scorpionfish	*Scorpaena gutatta*	Common; adult found in rock dikes & breakwater, soft bottom at night (1,2)
Olive rockfish	*Sebastes serranoides*	Common; juveniles in kelp around breakwater (1)
Cabezon	*Scorpaenichthys marmoratus*	Rare; adult (1)

(1) MEC 1988
(2) MEC 1999

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 bait 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. Sardines are also a component of the commercial bait fish harvest in the harbor. Both these species are important forage for piscivorous fish. The two other Coastal Pelagic species, the Pacific and jack mackerals are common but not overly abundant as adults in the harbor. The Pacific mackeral's main forage fish in the harbor is very likely 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 under represented in the 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 dredge 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 sites 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.

Project Activity	**Impact Assessment**
Channel Deepening	Deepening of channels from -45 ft. MLLW to -55ft. MLLW will have no long term effect on FMP species.
Turbidity	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 (401 Certification) from the Regional Water Quality Control Board.
Contaminant Suspension	Potential temporary adverse impact to FMP species in immediate area of contaminant dredging. Long term benefit of removing contaminants from the harbor ecosystem.
Submerged Fill	Temporary displacement of FMP species with long term benefit resulting from creation of shallow water which benefits most FMP species.
Landfill	Significant permanent loss of habitat for some FMP species and potential degradation of water quality parameter in Pier 300 Shallow Water Habitat. Dike construction beneficial to FMP species utilizing rocky habitat.
Utility Crossings	See turbidity above. There is no history of spills from past utility modifications.

Tables area a good way to offer summaries: Table 2 clearly explains the Federally managed species and lifestages which may be present within the project area; paragraph 6 of this section describes the relative effects on habitat; and Table 3 connects the specific actions and their effects on habitat used by Federally managed species.

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/410 Certification of the Regional Water Quality Control Board.

Of the activities identified above, the loss of general marine resources due to construction of land as disposal sites for dredge material (sites 1 and 4) is considered a significant adverse

impact requiring mitigation. The appropriate mitigation has, in the past, been determined in coordination with National Marine Fisheries Service (NOAA Fisheries), 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 mitigation 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 in the Port's existing Bolsa Chica Mitigation, Outer Harbor Mitigation Bank, and Inner Harbor Mitigation Bank (Table 4). While there is mitigation available for construction of fill associated with disposal site 4, there is probably not enough mitigation available for construction of an 80 acre 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).

Mitigation Bank	Approximate Credits Available	Value in Deep Outer Harbor	Value in Shallow Outer Harbor **	Value in Inner Harbor Slips
Bolsa Chica	70	70	~47	140
Outer Harbor Bank	46	46	~31	92
Inner Harbor Bank	6	n.a.	n.a.	6
Total	122	116	78	238

* 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 separate EFH Determination or Conclusion section at the end of the assessment.

Additionally, the action agency is offering it's interpretation of sustainability for the fishery. This offering is not required and is not within the action agencies expertise to make this determination. NOAA Fisheries suggests that agencies refrain from this type of determination.

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.

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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 actions proposed by the ORU Pipeline Project may affect EFH designated by the National Marine Fisheries Service (NOAA Fisheries) and Gulf of Mexico Fisheries Management Council (GMFMC), 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 inches 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 2.1-1. Typically, a 200-foot-wide right-of-way (ROW) would be set aside, for the permanent right-of-way, in all offshore areas in which the pipeline is to be laid. A total of 9,168.5 acres would be included in that ROW in Federal waters. Approximately 1,423 acres would be affected in South, and Deep-South state waters.

The installation of the offshore portion (defined in this report as shoreline 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 project area varies from approximately zero to 800 feet deep.

Alignment and profile 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 is currently expected to be limited to land sites on which directional drilling rigs may be located, locations of proposed pipeline crossings, and dredging of the pipeline route and water exit points. 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

State	County	Diameter (inches)	Length (miles)
South	Onshore	36	9.0
	Offshore	36	330.0
		36	16.7
Deep-South			
	Offshore	36	25
	Onshore	36	145
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 also be required until the pipeline reaches sufficient water depth to allow the use of a bury barge. Dredging would be accomplished with either a barge-mounted bucket dredge or dragline. The spoil from the dredged trench would be placed on either side of the proposed pipeline route, depending upon prevailing wind and waves. 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 natural bottom of the seabed 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 bottom (see Section 2 of the FEIS , Figure 2.3.4-1). In the shallow waters wherever pre-dredging is not needed, the jetting technique will be used out to the 40-foot depth contour (see Section 2 of the FEIS , Figure 2.2.2-1). The jetting equipment would be towed behind a barge, or in shallow water, the jetting nozzles and air lifts are mounted on a pivoting arm suspended from a shallow water bury barge. Smaller jetting equipment could also be hand-held 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. Accurate placement of all anchors and anchor cables within the construction corridor would be monitored with GPS equipment onboard each vessel.

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's area of effect is 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 Fishery Management Plan (FMP) (U.S.C. 1853(a)(7)). There are FMP's in the Gulf region for shrimp, red drum, reef fishes, 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 sub-tidal vegetation (grasses and algae) and adjacent inter-tidal vegetation (marshes and mangroves).” The ORU Pipeline Project crosses estuarine systems in Big River Sound at lines 200 and 060 in Big River and South, and in EndoftheLine Bay at line 200 in Deep-South. Coastal estuarine fisheries are crossed in Big River Sound, Bayou Matthew, Bayou Mark, and Bayou Luke, and again within EndoftheLine Bay. Estuarine fishes include species that inhabit the estuary for part of their life cycle and are commonly associated with seagrass beds, oysters 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 3-1. Gulf of Mexico Fishery Resources with Designated EFH

Fishery Management Unit	Common Name	Scientific Name
Shrimp Fishery	brown shrimp	*Penaeus aztecus*
	white shrimp	*Penaeus setiferus*
	pink shrimp	*Penaeus duorarum*
Red Drum Fishery	red drum	*Sciaenops ocellatus*
Reef Fishery	red grouper	*Epinephelus morio*
	yellowtail snapper	*Ocyurus chysurus*
	Tilefish	*Lopholatilus chamaeleonticeps*

	gray triggerfish	*Balistes capriscus*
Spiny Lobster Fishery	spiny lobster	*Panulirus argus*
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 and/or demersal, and oceanic pelagic (MMS, 1999). The major coastal pelagic species are listed in the FEIS (Table 4.6.1-1). 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 reef fishes occurring over the project route include groupers, snappers, damselfishes, and gobies (Smith, 1976). Oceanic pelagic species occur in open ocean areas of the Gulf especially at or beyond the shelf edge, and are reportedly associated with mesoscale hydrographic features such as fronts, eddies, and discontinuities (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 Fisheries' Galveston web page (www.galveston.ssp.nmfs.gov/efh). The EFH determination is based on species distribution maps and habitat association tables. In estuaries, the EFH of each species consists of those areas depicted on the maps as "common", "abundant" and "highly abundant". In offshore areas, EFH consists of those areas depicted 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 (see http://galveston.ssp.nmfs.gov/efh, and http://christensenmac.nos.noaa.gov/Gulf-EFH), 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 offshore waters to depths of 360 feet. Postlarve and juveniles typically occur

within estuaries while adults occur outside of bay areas. In estuaries, brown shrimp postlarve and juveniles are associated with shallow vegetated habitats but also are found over silty sand and non-vegetated mud bottoms. In Deep-South, adult areas are primarily seaward of EndoftheLine Bay, and associated with silt, muddy sand, and sandy substrates.

Spawning area: shores of Big River and South through state waters; Deep-South waters to edge of the continental shelf; year round

Nursery area: Big River Sound (major nursery area) EndoftheLine Bay

White Shrimp

White shrimp are offshore and estuarine dwellers, and are pelagic or demersal depending on their life stage. 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. Juveniles move from estuarine areas to coastal waters as they mature. Adult white shrimp are demersal and generally inhabit nearshore Gulf waters in depths less than 100 ft on soft mud or silty bottoms. In Deep-South, white shrimp are not common east or south of Gazuntight Bay (Williams et al., 1990).

Spawning area: off Big River and South; March to October

Nursery area: Big River Sound

Pink Shrimp

Juvenile pink shrimp inhabit most estuaries in the Gulf but are most abundant in Deep-South. Juveniles are commonly found in estuarine areas with seagrass. Postlarve, juvenile, and subadults may prefer coarse sand/shell/mud mixtures. Allen et al. (1980) found early juvenile pink shrimp in Deep-South Bay to be most abundant in *Halodule wrightii* beds and less abundant in *Thalassia testudinum*. Adults inhabit offshore marine waters, with the highest concentrations in depths of 30 to 144 feet. According to the NOAA Fisheries species distribution maps, pink shrimp use EndoftheLine Bay from the larval stage until the species matures to the late juvenile stage.

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

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

Red Drum

In the Gulf, red drum occur in a variety of habitats, ranging from depths of about 130 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. Estuaries are important to red drum for both habitat requirements and for dependence on

prey species which include shrimp, blue crab, striped mullet, and pinfish. The GMFMC considers all estuaries to be EFH for the red drum. Schools of large red drum are common in the deep Gulf waters with spawning occurring 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 demersal and occurs throughout the Gulf at depths from 10 to about 650 feet, preferring 100 to 400 foot depths. Juveniles are associated with inshore hard bottom habitat, and grassbeds, rock formations, while shallow reefs are preferred for nursery areas. Species distribution maps show that spawning for the red grouper occurs throughout much of the OCS waters off Deep-South, including the Deep-South Middle Grounds and Steamboat Lumps. Nursery areas occur along the entire length of the pipeline route in OCS waters.

Spawning area: Deep-South continental shelf, well offshore, extending from south of Blessyou Bay all the way to west of the Deep-South keys; April to May

Nursery area: extensively throughout the continental shelf off Deep-South and along the northern Gulf; year round

Yellowtail Snapper

Juvenile yellowtail snapper are found in nearshore nursery areas over vegetated sandy substrate and in muddy shallow bays (NOAA 1985). *Thalassia* beds and mangrove roots are preferred habitat of the gray snapper. Late juvenile and adults prefer shallow reef 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

Tilefish

Tilefish occur 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.

Spawning area: throughout the adult area from March to September

Nursery area: year-round throughout the adult area

Gray Triggerfish

Larval and juvenile gray triggerfish are associated with grassbeds (Sargassum) and mangrove estuaries. Adults seem to prefer offshore waters 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 Atlantic (SEA), at the EFH web page (http://christensenmac.nos.noaa.gov/gom-efh/gtrigger.gif). This map indicated that there is a record of occupancy for gray triggerfish in state waters of Big River/South and Deep-South. Records of individuals caught in OCS waters along the proposed pipeline route were grouped into two offshore areas. One small area is south of South in the northwest section of the Reston Dome area, and another is along the coastal waters off of Deep-South.

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

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 bays, lagoons, 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 lobster in the Bay are rare. However, the Gulf distribution maps indicate that EndoftheLine Bay is used as an adult area year round, and as a nursery area. Spiny lobster are known to occur in northern and western Gulf habitats, but these area are not designated EFH.

Spawning area: throughout the adult area, 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.

The managed fish species section 4.0 describes the habitats and species' life stages and life histories that are found in the action area.

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 areas. Potential impacts to commercial fishing would be temporary and minor since fish displaced would rapidly return to the affected areas after construction. The increase in sediment loads during pipeline construction would be temporary as the suspended sediments redeposit upon completion.

A temporary loss of food supply for finfish and crustaceans could occur during construction; however, the new pipeline may also attract fish to recently trenched areas. Impacts to shellfish, particularly shrimp, would be minimal since the proposed route does not traverse any known commercial shellfish beds. Construction would occur from September through March during non-spawning months to minimize impacts on shellfish species. The shellfish beds in the proposed project area are not very dense and are located at sufficient distances from the pipeline route. Thus any impacts from turbidity, smothering or removal would be minor.

Extensive areas of live bottom that serve as important reef fish habitat occur along the shallower portions of the project area. However, pipeline route alterations have minimized the area of live bottom crossed to 0.18 miles within state waters. The quality of habitat of this segment would be reduced for sections of the live bottom where sponges, soft corals, hard corals and tunicates are disturbed or adversely affected by construction. These resources may be killed or buried in sediments during construction. These impacts would be long term, since recovery could exceed three years.

5.1.2 Impacts to the Marine Component of the EFH

Potential impacts to fish and shellfish species from activities associated with construction and

operation of the proposed ORU pipeline may come from temporary degradation of water quality due to trenching, burial, the release of drilling fluids from HDD operations, emplacement of pipelines, and fuel spills (MMS, 1997). Many marine finfish, shellfish, pelagic and demersal fish species are estuary dependent, and because of this any coastal environmental degradation resulting from the proposed pipeline construction, although indirect, would have the potential to adversely affect these species. The environmental deterioration and effects on these species would also result from any loss of coastal wetlands, mangroves or seagrasses, which function as nursery habitats for many commercial and recreational species, and from the functional impairment of existing habitat through decreased water quality. Potential impacts to fish and shellfish are most likely the result of impacts to the habitats of these species.

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 utilized to install the pipeline below the mudline. Because the post-plow method would be used to lower the pipe in all waters deeper than 40 feet out to the 200-foot contour, 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 live bottom 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 to be affected by cable sweep is expected to be relatively extensive, but the effect on live bottom would be considerably less than anchor scars, when compared per unit of area affected. It is expected for the area of cable sweep, that some areas of live bottom would survive relatively intact (e.g. areas of live bottom

organisms within depressions and areas where the cable does not make complete contact with the sediments or rock). The areas could provide stock material for a more rapid re-colonization and recovery of adjacent live bottom habitat.
A study of anchor scar effects for the size barges that will be used on this project predicts an average anchor scar 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 sea bottom community would be from cable sweep. Under this initial construction plan, as submitted in the DEIS, 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 use of anchors during pipeline lowering because the plow is controlled from a Dynamically Positioned mother ship. Dynamic positioning consists of a series of thrusters on the vessel bow and stern that hold the vessel in place. No anchors are needed, therefore all potential impacts associated with mooring are avoided by the use of this technology. According to ORU, this measure would result in a 32 percent reduction (1,770 acres) of impacts, or a reduction from 5,534 acres to 3,764 acres of live bottom impacts.

Other impacts to the sea bottom community include the area of impact by pipelay directly on the sea bottom (in waters deeper than 200 feet), the area of direct trenching by the post-plow. The area affected directly by the trenching is the assumed width of the top of the trench, or 25 feet wide plus the area affected by the re-deposition of sediments for 25 feet on either side of the pipe centerline. According to ORU's surveys, pipelay will effect approximately 55 acres of exposed rock live bottom.

The summation of these post-plow lowering, excavation, redeposition, and pipelay impacts is given in the table below.

Table 5-1. Total Estimated Direct Impact to Sea Floor and Live Bottom from the Installation of the ORU Pipeline within the 180 Mile OCS Low Relief Live Bottom Stipulation Area

Activity	Water Depth Range (feet)	Sea Floor Impacts (acres)	Deep-South State Waters (acres)	Federal Waters (acres)	Totals (acres)
Pipelay on the Sea Floor	>200	28.7	NA	3.4	3.4
Trenching Direct (Post-plow)	3 League Line to 200	1,100	4.0	198.6	202.6
Anchor Scarring	3 League Line to 420	31.8	1.1	4.1	5.2
Anchor Cable Sweep	3 League Line to 420	1,949.4	67.1	254.0	321.1

Total Direct Impact Subtotal	**1,160.5**	**72.2**	**460.1**	**532.3**

Potential for Offshore Oil Spills

Another category of impacts to marine and estuarine fish and wildlife is the potential for accidental spills of petroleum lubricants 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 will involve a significant amount of work activity aboard vessels, and the movement of pipeline lay barges, supporting 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 toxic substance (fuel) spills. Construction of the pipeline may result in destruction of physical habitat or structure. However, backfilling during construction could also create new 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.

This is also a good section. The separation of the estuarine and marine components and types of activities facilitates the review of this assessment.

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, burial, and pipelay, spills, discharge of HDD drilling muds).

Most of the above effects are temporary, and would be offset by special construction techniques or environmental protection guidelines, or are negligible considering the localized effect of the actions compared to the area of the Gulf that would be unaffected. In this sense, the coastal and marine environmental degradation from the proposed action would have minor effects on designated EFH or commercial fisheries. Although, disruption of live bottom habitats is considered a significant localized impact, it is reversible. Direct loss to fish populations, if any, are likely to be undetectable. Recovery of EFH and commercial fisheries is expected to occur quickly (one growing season) for the majority of the affected environment.

The EFH impact evaluation process for the ORU Pipeline Project is 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

Type of Impact	Temporary [Recovery Days to Weeks]	Short Term [Recovery <3 Years]	Long Term [Recovery >3 to <20 Years]	Permanent [Recovery ≥20 Years]	Cumulative
Post-plow Lowering*		✓	✓		
Barge Anchoring*				✓	
Pipelay on Seafloor (trenched; <200 ft deep)*		✓			
Pipelay on Seafloor (not trenched; not buried)				✓	
Sedimentation/Turbidity–	✓				
Disruption of Live Bottoms/Hard Substrate*			✓	✓	✓
Disruption of Live Bottoms/Soft Substrate*		✓	(✓)		
Seafloor Area Occupied*				✓	✓
Epifauna/Infauna Destruction*			✓		
Fish Fauna Disruption Species–	✓				
Fish Fauna Disruption Habitat–		✓			
Reduction Water Quality/Spills, Mud discharges*		✓			

– 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 activities 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 seagrass and mangrove communities in EndoftheLine Bay.

· ORU has been proactive in avoiding construction of permanent access channels. Particular consideration was given to the placement of exit holes for all horizontal directional drilling to minimize volume of dredging for pipe transition zones. Special construction techniques (e.g., push ditch method) will be considered for any pipeline installation involving coastal wetlands (i.e., 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 continuation of 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, silt curtains or another type of barriers will be used to reduce turbidity and sedimentation. These silt barriers should extend at least 100 feet beyond the limits of the seagrass beds or oyster reefs.

· ORU has avoided oyster reefs and seagrass beds through pipeline alignment design and with the 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.

· Drilling 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 habitat/live bottoms, 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.

These bulleted mitigative measures area a good way to provide this input for NOAA Fisheries review. The bullets are concise, easy to follow, and allow feedback from NOAA Fisheries to be specific.

6.0 CONCLUSIONS

Despite efforts to avoid live bottom habitats and shelf edge hard banks, the selected route traverses 28.8 miles of live bottom habitat, and 0.5 mile of hard bank 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 live bottom and hard bank

affected, including both state and federal waters, would be approximately 535 acres. The effects on exposed rock live bottom (i.e. that portion of live bottom that may support the growth of hard corals) is approximately 59.3 acres of total impact. For perspective, approximately 38 percent, or about 11,103,880 acres of the West Deep-South Shelf from Lockville to Racetown has been categorized as "reef habitat", including rocks, corals and sponges (Parker et al., 1983).

The remainder of the marine segment of pipeline would be soft bottom habitat across 407.8 miles (93 percent of the shoreline to shoreline Gulf crossing of the total 437.1 miles). Thus the selected route is bias towards crossing soft bottom (or sand bottom) habitat, which is more resilient to temporary disturbance and whose ability to recover to pre-project conditions is faster than that of live bottom habitat. This is a 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 live bottom habitat), since full recovery can require up to 30 to 50 years. The other example of a permanent impact is the change of bottom type from natural sediment to the artificial substrate of the pipeline itself in areas deeper than 200 feet 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 section is good, in that it concludes there may be some temporary and permanent effects. However, it 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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