APPENDIX B

BIOLOGICAL ASSESSMENT

Biological Assessment for Wastewater Discharges Associated with the Osprey Platform in the Redoubt Shoal Unit Development Project

Cook Inlet, Alaska

Submitted to

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March 16, 2001

Contract No. 68-W7-0050, Delivery Order 2004
SAIC Project No. 06-5050-01-9695-003

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

The Clean Water Act, PL-92-500, as amended, authorizes the U.S. Environmental Protection Agency (EPA) to administer the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES program regulates discharges from point sources to waters of the United States. While the majority of states are currently authorized to administer the NPDES program, the State of Alaska is not among them. Thus, EPA regulates the point source discharges in the state by issuing NPDES permits.

Section 7 of the Endangered Species Act (ESA) requires federal agencies to conserve endangered and threatened species. It also requires all federal agencies to consult with the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS) if they determine that any action they fund, authorize, or carry out may affect a listed species or designated critical habitat. A biological assessment (BA) is prepared to determine whether a project or action will have an effect on a listed or proposed species, and to determine whether informal or formal consultation with NMFS and/or USFWS is required.

Forest Oil (formerly Forcenergy Inc.) has proposed the development of a new oil and gas project in the waters of Cook Inlet, Alaska to access reserves in the Redoubt Shoal Unit. As a result of the development, Forest Oil is proposing to convert the offshore Osprey Platform from a manned exploratory platform to a production platform. Forest Oil has applied to EPA for an NPDES permit for the discharge of wastewater from the Osprey Platform in Cook Inlet, Alaska.

This document provides an assessment of the impacts of the wastewater discharge on threatened and endangered species of marine mammals and birds that may be present in or near the project area. These discharges include deck drainage, sanitary wastewater, and domestic wastewater (gray water).

The following sections provide a description of the proposed action, summarize the life history and status of the threatened and endangered species of marine mammals and birds potentially present in or near the project area, and assess potential impacts of wastewater discharges from the project on these species. This document is prepared and submitted in compliance with the formal consultation requirements of Section 7 of the ESA.

2.0 DESCRIPTION OF THE PROPOSED ACTION

The Osprey Platform, by design, is a movable drilling platform that has been constructed to support exploration and eventually production drilling operations for the Redoubt Shoal Unit (Figure 1). The platform was placed onsite during late June 2000, approximately 1.8 miles southeast of the end of the West Foreland (Latitude 60º 41' 46" N, Longitude 151º 40' 10" W) (Figure 2). The West Foreland is considered the northernmost boundary of lower Cook Inlet. The platform is approximately 12 miles northwest of Kenai, Alaska and approximately 70 miles southwest of Anchorage, Alaska. The water depth at the platform is approximately 45 feet (referenced to mean lower low water). The platform is designed to handle anticipated oceanographic, meteorological, and seismic conditions for the area.

At the completion of exploration drilling operations, which are currently being conducted under the General NPDES Permit for Oil and Gas Exploration (AKG285024), the Osprey Platform will be used to either support offshore production operations (as addressed in this document) or be removed if oil and gas are not found in commercial quantities. Platform conversion would include the addition of limited production equipment and the installation of offshore pipelines and utility lines.

If the platform is not converted to production, wells will be plugged and abandoned, the piling and conductors will be cut, and the platform floated off-location (similar to the manner in which it was floated on-location). These operations would be conducted in accordance with regulations and with appropriate approvals from the Alaska Oil and Gas Conservation Commission (AOGCC), the Alaska Department of Natural Resources (ADNR), and the Minerals Management Service (MMS).

2.1 Production Activities

2.1.1 Completion

After confirmation of a successfully producing formation, the well will be prepared for hydrocarbon extraction, or "completion." The completion process includes: setting and cementing of the production casing; packing the well; and installing the production tubing. During the completion process, equipment is installed in the well that allows hydrocarbons to be extracted from the reservoir. Completion methods are determined based on the type of producing formation, such as hard or loose sand, and consist of four steps: wellbore flush, production tubing installation, casing perforation, and wellhead installation.

2.1.2 Fluid Extraction

The fluid that will be produced from the oil reservoir consists of crude oil, natural gas, and produced water. Production fluids will flow to the surface through tubing inserted within the cased borehole using electric submersible pumps. As hydrocarbons are produced, the natural pressure in the reservoir decreases and additional pressure must be added to the reservoir to continue production of the fluids. The additional pressure will be provided artificially to the

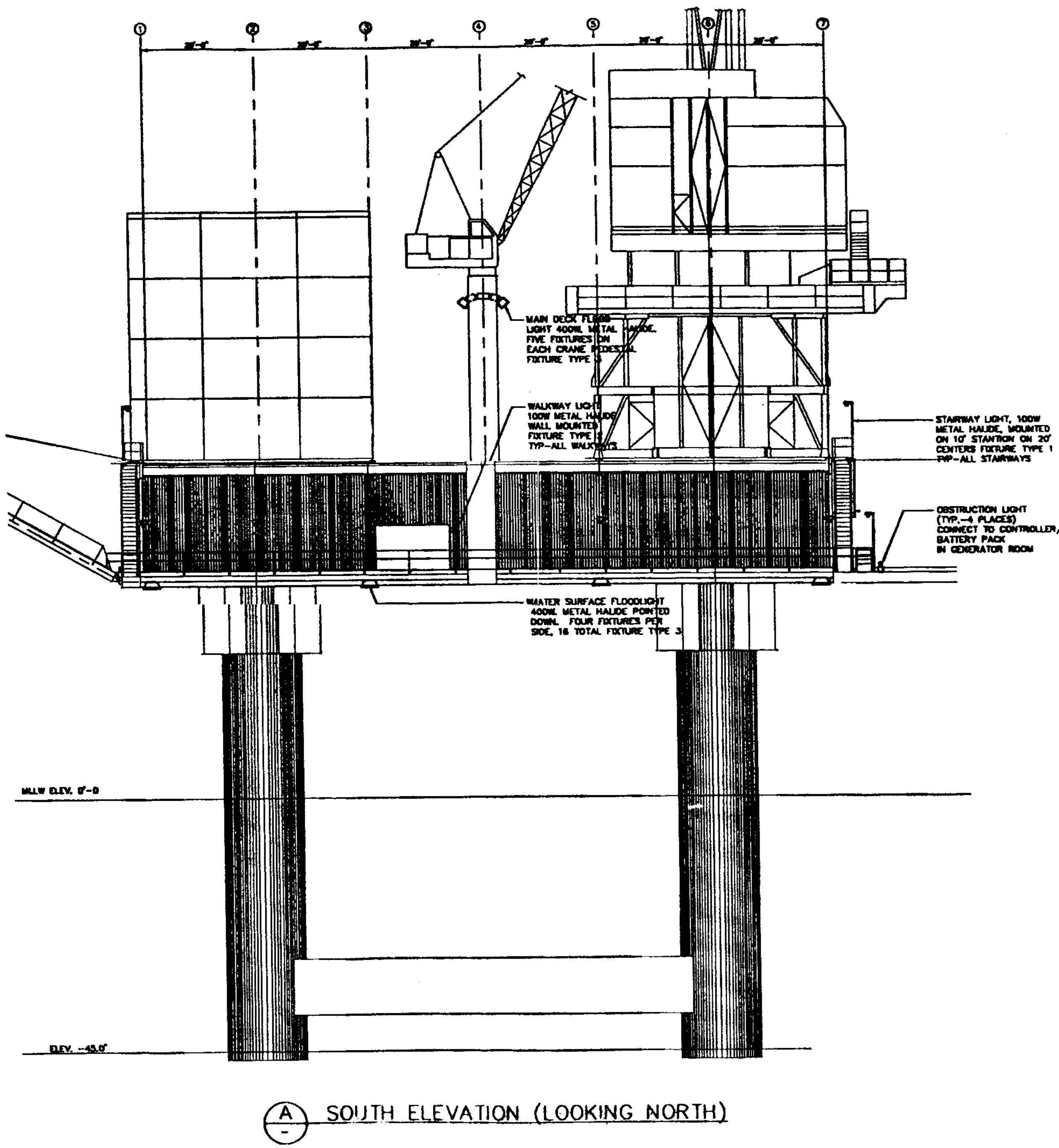

Figure 1. General Schematic of the Osprey Offshore Drilling Unit.

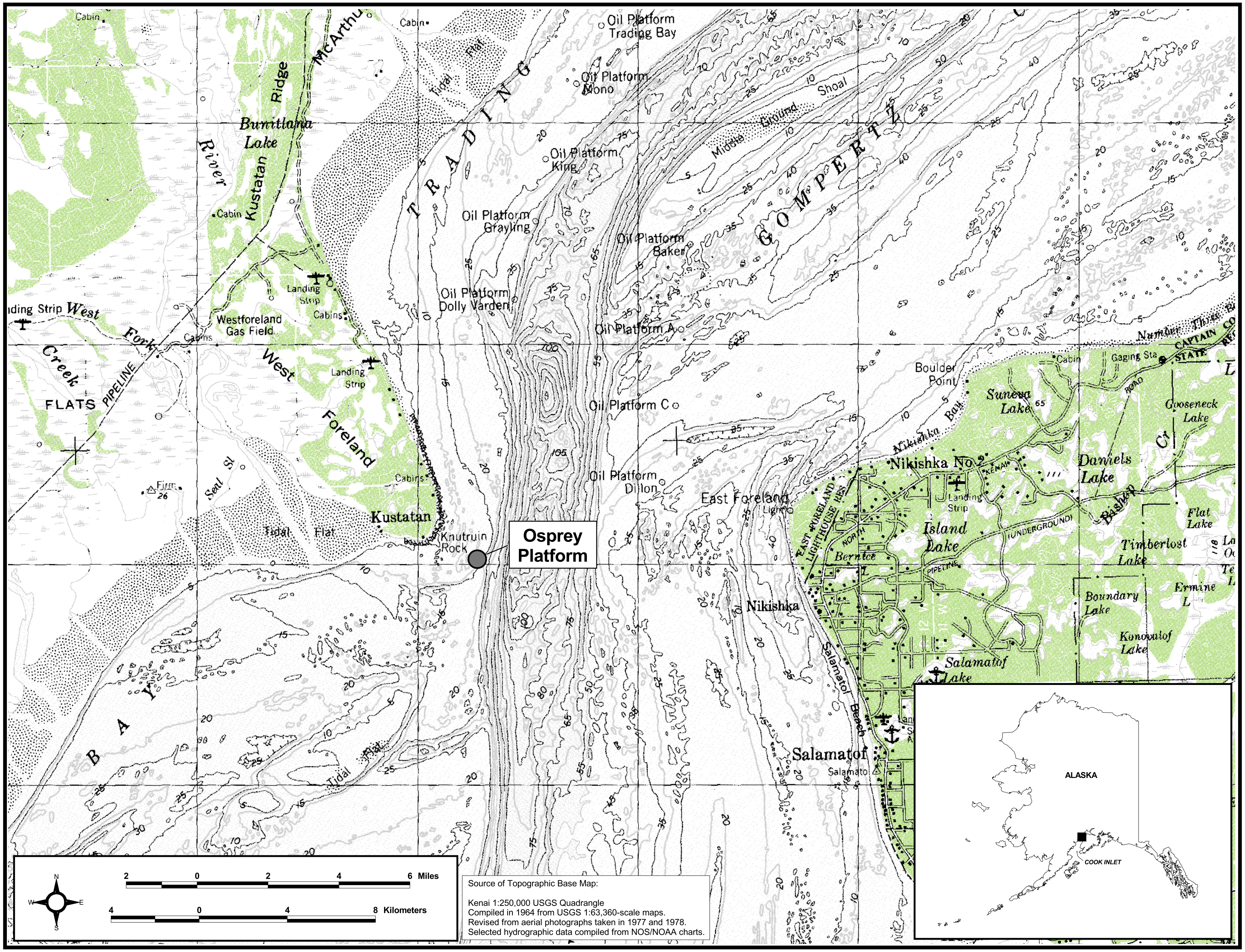

Figure 2. Location of the Osprey Platform in the Redoubt Shoal Development Area, Cook Inlet, Alaska.

reservoir using waterflooding, which is the injection of water into the reservoir to maintain formation pressure that would otherwise drop as the withdrawal of the formation fluids continues.

2.1.3 Fluid Separation

As the produced fluids (natural gas, crude oil, and produced water) surface from the wells, the gas will be separated from the liquids in a two-phase separator on the platform. The wet gases from the separator will pass through a glycol dehydrator to remove water and then will be used to support platform heating or will be shipped by pipeline to the onshore production facility. The liquids will be pumped to the Wet Oil Surge Vessel and then pumped to the onshore production facility for oil-water separation. There will be no storage capacity onboard the Osprey Platform for separated liquids. The produced water separated from the crude oil at the onshore production facility will then be pumped back to the Osprey Platform by pipeline for downhole injection to maintain formation pressures within the Redoubt Shoal Unit.

2.1.4 Well Treatment

Well treatment is the process of stimulating a producing well to improve oil or gas productivity. It is not anticipated that stimulation will be needed for the wells. However, if well treatment is required at the Osprey Platform, the method used will be acid treatment. Acid stimulation is performed by injecting acid solutions into the formation. The acid solution dissolves portions of the formation rock, thus enlarging the openings in the formation. The acid solution must be water soluble, safe to handle, inhibited to minimize damage to the well casing and piping, and inexpensive.

2.1.5 Workover

Workovers or treatment jobs occur approximately once per year. Workover operations are performed on a well to improve or restore productivity, repair or replace downhole equipment, evaluate the formation, or abandon the well. Workover operations include well pulling, stimulation (acidizing and fracturing), washout, reperforating, reconditioning, gravel packing, casing repair, and replacement of subsurface equipment. The four general classifications of workover operations are pump, wireline, concentric, and conventional. Workovers can be performed using the original derrick. The operations begin by using a workover fluid to force the production fluids back into the formation, to prevent them from exiting the well during the operation.

2.1.6 Well Drilling

Rotary drilling is the process that is used to drill the well. The rotary drill consists of a drill bit attached to the end of a drill pipe. The most significant waste streams, in terms of volume and constituents associated with the drilling activities, are drilling fluids and drill cuttings. Drill cuttings are particles (e.g., sand, gravel, etc.) generated by drilling into subsurface geological formations and carried to the surface with the drilling fluid. The drilling fluid, or mud, is a mixture of water, special clays, and certain minerals and chemicals used to cool and lubricate the bit, stabilize the walls of the borehole, and maintain equilibrium between the borehole and the formation pressure. The drilling fluid is pumped downhole through the drill string and is ejected through the nozzles in the drill bit and then circulated to the surface through the annulus. The drilling fluids will be separated from the drill cuttings on the platform for use as make-up drilling fluids.

2.2 WASTE STREAMS ASSOCIATED WITH THE PROPOSED ACTIVITY

The Final NPDES General Permit for Oil and Gas Exploration, Development, and Production Facilities in Cook Inlet AL (AKG285000, 64 FR 11885) identified 19 waste streams. According to Forest Oil's Environmental Information Document (NCG 2001), the following waste streams will not be generated at the Osprey Platform: desalination unit wastes (Discharge No. 005); uncontaminated ballast water (Discharge No. 010); bilge water (Discharge No. 011), and muds, cuttings, cement at seafloor (Discharge No. 013). The remaining waste streams are discussed in the following sections.

2.2.1 Drilling Fluids (Discharge No. 001)

Drilling fluids are the circulating fluids (muds) used in the rotary drilling of wells to clean and condition the hole, to counterbalance formation pressure, and to transport drill cuttings to the surface. A water-based drilling fluid is the conventional drilling mud in which water is the continuous phase and the suspending medium for solids, whether or not oil is present. An oil-based drilling fluid has diesel, mineral, or some other oil as its continuous phase with water as the dispersed phase. Production drilling operations onboard the Osprey Platform will use a combination of both freshwater-based and oil-based drilling fluids. The freshwater-based drilling fluids will typically be used for the upper 2,500 feet of the well and the oil-based drilling fluids will be used for depths below 2,500 feet (NCG 2001). The drilling fluids will be separated from the drill cuttings on the platform for use as make-up drilling fluids.

2.2.2 Drill Cuttings (Discharge No. 001)

Drill cuttings are the particles generated by drilling into subsurface geologic formations and carried to the surface with the drilling fluid. The separated drill cuttings will be disposed of in a Class II injection well that has been permitted with the Alaska Oil and Gas Conservation Commission (AOGCC).

2.2.3 Dewatering Effluent (Discharge No. 001)

Dewatering effluent is wastewater from drilling fluid and drill cutting dewatering activities. The dewatering effluent will be disposed of with the separated drill cuttings into a Class II injection well that has been permitted with the AOGCC.

2.2.4 Deck Drainage (Discharge No. 002)

Deck drainage refers to any waste resulting from platform washing, deck washing, spillage, rainwater, and runoff from curbs, gutters, and drains, including drip pans and wash areas. This could also include pollutants, such as detergents used in platform and equipment washing, oil, grease, and drilling fluids spilled during normal operations (Avanti 1992). On the Osprey Platform, deck drainage will be treated through an oil-water separator prior to discharge (Amundsen 2000). The average flow of deck drainage from the platform will be 108,000 gallons per day (gpd) (NCG 2001), depending on precipitation. This discharge will be in accordance with the appropriate water quality standards for the state of Alaska (18 AAC 70.020).

2.2.5 Sanitary Waste (Discharge No. 003)

Sanitary waste is human body waste discharged from toilets and urinals. The sanitary waste system on the Osprey Platform, an aerated marine sanitation device, will serve a 3- to 55-person crew residing on the platform at any one time. The expected maximum quantity of sanitary waste discharged is 2,020 gpd (United Industries Group 1998 and NCG 2001). The pollutants associated with this discharge include suspended solids, 5-day biochemical oxygen demand (BOD_5), fecal coliform, and residual chlorine. All sanitary discharges will be in accordance with the appropriate water quality standards and effluent treatability requirements for the state of Alaska (18 AAC 70, 18 AAC 72, and 40 CFR 133.105).

2.2.6 Domestic Waste (Discharge No. 004)

Domestic waste (gray water) refers to materials discharged from sinks, showers, laundries, safety showers, eyewash stations, and galleys. Gray water can include kitchen solids, detergents, cleansers, oil and grease. Domestic waste will not be treated prior to discharge. The expected quantity of domestic waste discharged is 4,000 gpd (NCG 2001). All domestic discharges will be in accordance with the appropriate water quality standards for the state of Alaska (18 AAC 70).

2.2.7 Blowout Preventer Fluid (Discharge No. 006)

Blowout preventer fluid is hydraulic fluid used in blowout preventer stacks during well drilling. According to Forest Oil's Environmental Information Document (NCG 2001), blowout preventer fluid will not be discharged from the Osprey Platform.

2.2.8 Boiler Blowdown (Discharge No. 007)

Boiler blowdown is the discharge of water and minerals drained from boiler drums to minimize solids build-up in the boiler. The expected quantity of boiler blowdown is 100 gpd. Boiler blowdown will be treated through an oil-water separator prior to discharge (Amundsen 2000). This discharge will be in accordance with the appropriate water quality standards for the state of Alaska (18 AAC 70).

2.2.9 Fire Control System Test Water (Discharge No. 008)

Fire control system test water is sea water that is released during the training of personnel in fire protection, and the testing and maintenance of fire protection equipment on the platform. This discharge is intermittent, and is expected to occur approximately 12 times per year. The expected quantity of fire control system test water is 750 gallons per minute (gpm) for 30 minutes, for a total discharge per event of 22,500 gallons. Contaminated fire control system test water will be treated through an oil-water separator prior to discharge. This discharge will be in accordance with the appropriate water quality standards for the state of Alaska (18 AAC 70).

2.2.10 Non-Contact Cooling Water (Discharge No. 009)

Non-contact cooling water is sea water that is used for non-contact, once-through cooling of various pieces of machinery on the platform. The expected quantity of non-contact cooling water is 300,000 gpd. This discharge will be in accordance with the appropriate water quality standards for the state of Alaska (18 AAC.70).

2.2.11 Excess Cement Slurry (Discharge No. 012)

Excess cement slurry will result from equipment washdown after cementing operations. This waste stream will be discharged intermittently while drilling, depending on drilling, casing, and testing program/problems (Amundsen 2000). Approximately 30 discharge events are anticipated per year, with a maximum discharge of 100 bbl (or about 4,200 gallons) per event. Excess cement slurry will not be treated prior to discharge. Discharge of this waste stream will be in accordance with the appropriate water quality standards for the state of Alaska (18 AAC 70).

2.2.12 Waterflooding Discharges (Discharge No. 014)

Waterflooding discharges are discharges associated with the treatment of seawater prior to its injection into a hydrocarbon-bearing formation to improve the flow of hydrocarbons from production wells, and prior to its use in operating physical/chemical treatment units for sanitary waste. These discharges include strainer and filter backwash water. All waterflooding discharges will be disposed of in a Class II injection well that has been permitted with the AOGCC.

2.2.13 Produced Water (Discharge No. 015)

Produced water refers to the water (brine) brought up from the hydrocarbon-bearing strata during the extraction of oil and gas, and can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process. The produced water will be disposed of in a Class II injection well that has been permitted with the AOGCC.

2.2.14 Well Completion Fluids (Discharge No. 016)

Well completion fluids are salt solutions, weighted brines, polymers, and various additives used to prevent damage to the well bore during operations which prepare the drilled well for hydrocarbon production. The well completion fluids will be disposed of in a Class II injection well that has been permitted with the AOGCC.

2.2.15 Workover Fluids (Discharge No. 017)

Workover fluids are salt solutions, weighted brines, polymers, or other specialty additives used in a producing well to allow safe repair and maintenance or abandonment procedures. The workover fluids will be disposed of in a Class II injection well that has been permitted with the AOGCC.

2.2.16 Well Treatment Fluids (Discharge No. 018)

Well treatment fluids refers to any fluid used to restore or improve productivity by chemically or physically altering hydrocarbon-bearing strata after a well has been drilled. The well treatment fluids will be disposed of in a Class II injection well that has been permitted with the AOGCC.

2.2.17 Test Fluids (Discharge No. 019)

Test fluids are discharges that occur if hydrocarbons located during exploratory drilling are tested for formation pressure and content. This would consist of fluids sent downhole during testing, along with water from the formation. The test fluids will be disposed of in a Class II injection well that has been permitted with the AOGCC.

2.2.18 Produced Solids (Discharge No. 021)

Produced solids are sands and other solids deposited from produced water which collect in vessels and lines and which must be removed to maintain adequate vessel and line capacities. The produced solids will be disposed of in a Class II injection well that has been permitted with the AOGCC.

3.0 DESCRIPTION OF THE PROJECT AREA

The project area is considered to be Cook Inlet waters located between the West and East Forelands area of Cook Inlet in southcentral Alaska. This area is considered to be the upper portion of lower Cook Inlet. The Cook Inlet basin is an elongated depression of the earth's crust between two major parallel mountain ranges, the Kenai Range in the southeast and the Alaska Range to the northwest (Montgomery Watson 1993). The basin is underlain by thick sedimentary deposits that exceed 30,000 feet in some places (Wilson and Torum 1968). Sedimentary rocks, such as conglomerates, sandstones, siltstones, limestone, chert, volcanics, and clastics, make up the Cook Inlet basin.

Plate movement was responsible for creating the basin and mountain ranges. Several major glaciations have altered the landscape of the region (USACOE 1993). During the Pleistocene age glaciers pushed beyond the mountain fronts into the lowlands, depositing sediment and debris up to several thousand feet thick. As the glaciers receded, Cook Inlet assumed its present form (USACOE 1993). Active volcanoes and earthquakes are common to the area as well.

Cook Inlet is characterized by extreme tidal fluctuations of up to 12.2 meters that produce strong currents in excess of eight knots (Tarbox and Thorne 1996). Tides wash in and out of the Cook Inlet basin like a very long wave (Haley et al 2000). Fluid motion on this large scale is affected by the rotation of the earth, causing incoming currents in Cook Inlet to veer toward the east coast and outgoing currents to veer to the west coast (MMS 1984). Tidal ranges on the eastern shore are generally larger than ranges on the western shore because incoming currents have more energy. In the deeper, broader areas of the lower Cook Inlet, the tidal current changes directions in an elliptical pattern, known as rotary tides (Haley et al 2000).

Water quality in upper Cook Inlet is influenced by the high currents and large volumes of seasonally varying freshwater inflows (Montgomery Watson 1993). The high tidal currents tend to keep the entire water column well mixed; little vertical stratification is present except near the mouths of major rivers (Haley et al 2000). Large, glacier-fed rivers, such as the Susitna and Knik rivers, which flow into the inlet, contribute large amounts of freshwater and suspended sediments (Montgomery Watson 1993).

The climate of the central Cook Inlet region is transitional between maritime and continental regimes (Montgomery Watson 1993). Regional topography and water bodies heavily influence area climate. The Kenai Mountains to the south and east act as a barrier to warm, moist air from the Gulf of Alaska. Precipitation in Cook Inlet averages less than 20 percent of that measured on the Gulf of Alaska side of the Kenai Mountains (Montgomery Watson 1993). The Alaska Range to the north provides a barrier to the cold winter air masses that dominate Interior Alaska. Cook Inlet waters tend to moderate temperatures in the area.

4.0 STATUS OF THREATENED AND ENDANGERED SPECIES AND CRITICAL HABITAT IN THE PROJECT AREA

Forest Oil's Osprey Platform is located in lower Cook Inlet. Cook Inlet provides habitat for several threatened and endangered marine mammals and birds. This section describes the Threatened and Endangered Species (TES) that are present in the project area, the current stock assessments for each species, and their designated critical habitat.

4.1 BIRDS

Two species of threatened or endangered birds may be found in the proposed action area of the offshore Osprey platform:

- Steller's Eider (*Polysticta stelleri*)
- Short-tailed Albatross (*Phoebastria albatrus*)

4.1.1 Steller's Eider (*Polysticta stelleri*)

Steller's eiders are the smallest of the four eider species. Adult males can weigh up to 960 g and range from 45 to 47 cm in length (Bellrose 1980). Adult females range from 43 to 46 cm in length (Bellrose 1980). The head of the breeding male is predominantly white with black eye patches and light green tingeing on the forehead lores and below the eye. There is a broad black collar around the lower neck. Tertial feathers are bi-colored longitudinally, with the inner half being bluish-black, which gives the back a striped appearance when the wings are folded. The breast and belly are shaded chestnut to black posteriorly. The flanks, rump, and under-tail coverts are black, and the wedge-shaped tail is dark brown. Males in eclipse plumage during late summer and fall are entirely mottled brown with the exception of the wings. They resemble male's adult breeding plumage with white upper wing-coverts. Females and juveniles are mottled brown year-round and the female adult has a blue speculum bordered in white (65 FR 49).

4.1.1.1 <u>Distribution</u>

The U.S. Fish and Wildlife Service (USFWS) recognizes three breeding populations of Steller's eider, two in the Russian Arctic and one in the Alaskan Arctic. The Russian populations are distinguished by separate breeding and wintering grounds. The Russian Atlantic population nests west of the Khatanga River and winters in the Barents and Baltic Seas. The Russian Pacific population nests east of the Khatanga River and winters in the southern Bering Sea and North Pacific Ocean, where it presumably mixes with the Alaskan breeding population. The Alaskan population of Steller's eider nests along the western Arctic Coastal Plain in northern Alaska from approximately Point Lay east to Prudhoe Bay, and in extremely low numbers along the Yukon-Kuskokwim Delta (65 FR 49). The extent of wintering grounds for this population is currently unclear, although the USFWS has proposed to designate much of southwest and south coastal Alaska as critical winter habitat under the Endangered Species Act (65 FR 49).

4.1.1.2 Life History

There is little information on the life history of Steller's eiders. Nesting occurs on the North Slope of Alaska in early to mid-June. The incubation period is approximately 24 days (Larned et al. 1992). Seasonal nesting distribution of the Alaskan breeding population of Steller's eiders varies from year to year. Historically, nesting ranged from St. Lawrence Island and the Hooper Bay area north to Barrow (AOU 1997), and has been rare east of Point Barrow. Steller's eiders migrate southward along the northwest coast of Alaska (Gabrielson and Lincoln 1959) to the Alaskan Peninsula, where they undergo a flightless molt for approximately ten to fourteen days (65 FR 49). Molting also occurs near St. Lawrence Island in the Bering Sea and on Karaginski Island in Russia (Kistchinski 1973). Additional molting areas have not yet been identified.

After molting, Steller's eiders are thought to over-winter in relatively ice-free marine waters from Kodiak Island west to Unimak Island, Alaska (Palmer 1976) and into lower Cook Inlet (USFWS 2000). Although movements of Steller's eiders within their winter range are unclear, recent observations of Steller's eiders wintering in Cook Inlet may indicate that Steller's eiders are associated with river mouths, due to concentrated food sources. USFWS biologists have seen rafts of Steller's eiders annually in the same area, within a mile of Deep Creek and the Ninilchik River, on the Kenai Peninsula (T. Antrobus, USFWS, pers. comm.).

The timing of spring migration to nesting grounds is dependent on weather conditions. Kessel (1989) noted that eiders move through the Bering Strait between mid-May and early June, returning to their nesting grounds. Generally, Steller's eiders gather in staging areas before beginning their spring migration. These staging areas can contain thousands to tens of thousands of eiders and are primarily located along the northern side of the Alaskan Peninsula, including Port Heiden, Port Moller, Nelson Lagoon, and Izembek Lagoon (65 FR 49). Staging areas for the spring migration may also be used as winter habitat. If environmental conditions are not suitable at a staging area, eiders will disperse to await better conditions. Once favorable weather conditions exist, they begin their northward migration. Inclement weather may slow or delay migration, and eiders have been observed along the southwestern coast waiting for more favorable migration conditions to occur.

4.1.1.3 Diet

Little is known about the Steller's eider diet during the breeding season (Quakenbush and Cochrane 1993). Peterson (1981) collected stomach samples of 96 eiders in Nelson Lagoon to determine diet. Samples were taken from three birds from feeding flocks every three weeks between April 17 and October 15, 1977 and from five birds of each age-sex category every two weeks between June 25 and October 1, 1979 (Peterson 1981). Peterson found blue mussels, other bivalves, and amphipods to be the primary prey. Troy (1988) found that mollusks comprised 88% (86% bivalves, 2% gastropods) and crustaceans comprised 8 % of the diet of eiders collected in southwest Alaska during September-October 1986, February-March 1987, and April-May 1987. Cottom (1939) reported that during the nesting season, 87% of eider diet is comprised of animal matter. Crustaceans, amphipods, and mollusks made up the largest percentage of prey species (45%, 39%, and 19% respectively).

Most data suggest little seasonal variation in the type of prey consumed, but proportions of each food type consumed may vary seasonally (Peterson 1981). Available literature on eider feeding habits suggests that eiders dive near shore to feed during the winter (64 FR 49). USFWS biologists speculate that Steller's eiders could be feeding on increased invertebrates because of nutrient loads associated with spawned salmon carcasses flushed from area rivers (T. Antrobus, USFWS, pers. comm.)

4.1.1.4 Predation

Raptors, gulls, jaegers, ravens, and foxes are the main predators of Steller's eiders. Gulls are thought to harass eiders in winter feeding grounds, as well as in nesting areas (65 FR 49).

4.1.1.5 Population Status

It is unclear whether the Alaskan breeding population of Steller's eider is declining, stable, or increasing. Eiders typically occur at low densities in the portion of the current breeding habitat that has been surveyed (65 FR 49). These factors make estimating abundance difficult. The USFWS currently conducts aerial surveys for nesting eiders on the North Slope of Alaska, but breeding population estimates vary greatly. Consequently, the abundance of nesting Alaskan Steller's eider is unknown (65 FR 49). However, USFWS estimates that hundreds or thousands of Steller's eiders occur in North Slope breeding flocks.

Although there is no current estimate for the number of nesting Steller's eiders on the Yukon-Kuskokwim Delta, their abundance has dramatically declined since 1960 (Kertell 1991). USFWS has yet to find a way to detect nesting eiders other than with aerial surveys, a technique that has been unsuccessful in the past on the Yukon-Kuskokwim Delta.

On December 10, 1990, the USFWS was petitioned to list the Steller's eider as endangered throughout its range and to designate critical habitat. In August 1993, the USFWS reviewed the status of Steller's eider and concluded that the available information did not support listing the species range-wide, but did support listing the Alaskan breeding population. Subsequently, the USFWS listed the Alaskan breeding population of Steller's eiders as threatened under the Endangered Species Act on June 11, 1997.

4.1.1.6 Critical Habitat

In January 2001, the USFWS designated approximately 7,330 square km of marine waters and land as critical habitat into five units (USFWS 2001). These units are located along the coastal areas of the Yukon-Kuskokwim Delta and along the Alaska Peninsula. Although Steller's eiders use a variety of habitats in Cook Inlet, none were designated as critical in the final rule.

4.1.1.7 Factors Affecting Survival

Little is known about the population dynamics of Steller's eiders. The reduction of eiders on historical breeding grounds suggests that Steller's eiders are either abandoning these historic nesting areas or that the population is declining. Currently, the causes of the population declines in Steller's eiders is unknown. Possible causes of decline include habitat loss or modification, increased predation in areas where human activities have artificially expanded predator populations by providing shelter and alternative food sources, lead poisoning on the Yukon-Kuskokwim Delta caused by the ingestion of lead shot while feeding, and food availability caused by changes in the Bering Sea ecosystem (USFWS 2000). In Siberia, possible causes of Steller's eider decline could also include habitat loss on the breeding grounds due to oil and gas exploration and unreported subsistence hunting (USFWS 2000).

4.1.2 Short-tailed Albatross (*Phoebastria albatrus*)

The short-tailed albatross is a pelagic seabird with long, narrow wings adapted for soaring low over the water. Its pink bill is hooked with a blue tip and has external tubular nostrils. The short-tailed albatross has a white back and a white head with yellow/gold crown and nape (Sherburne 1993). It is the largest of the three species of Northern Pacific albatross, with an average wingspan of 84 inches and an average body length of 37 inches (Farrand 1983).

4.1.2.1 Distribution

The short-tailed albatross was historically found year-around in the North Pacific from Siberia to the western coast of North America and the Bering Sea to the Hawaiian Islands (Roberson 1980). King (1981) reported their range as being approximately 66 degrees north latitude to 10 degrees north latitude.

4.1.2.2 Life History

Historically, the short-tailed albatross bred only in the western North Pacific (Sherburne 1993) on islands in Japan and Taiwan (63 FR 211). There are only two known active breeding colonies, one on Torishima Island and one on Minami-kojima Island. Sherburne (1993) stated that several short-tailed albatross have been sighted in the Hawaiian Islands during the breeding season, but no known nesting has occurred.

The short-tailed albatross has a relatively long life span, like many seabirds, and may reach 40 years of age (Sherburne 1993). Breeding age is approximately 6 years, at which time short-tailed albatross begin nesting every year. The short-tailed albatross is a monogamous, colonial nester and returns to nesting areas every year. Short-tailed albatross usually arrive at breeding colonies in Torishima, Japan in October and lay eggs by the end of the month. Females lay a single egg, and both parents incubate the egg for approximately 65 days. By late May, the chicks are almost full-grown and the adults leave, leaving the chicks to fledge (63 FR 211). Koblentz-Mishke (1965) suggested that post-nesting distribution coincides with increased abundance of zooplankton and increasing numbers of organisms at each trophic level, causing a northeastern movement towards the Aleutian Islands and the Bering Sea.

4.1.2.3 Diet

The diet of short-tailed albatross includes squid, small fish, and crustaceans (DeGrange 1981). Currently there is no information on diet by season, habitat, or environmental condition (63 FR 211).

4.1.2.4 Predation

Terrestrial predators of short-tailed albatross chicks include crows (*Corus* sp.) and possibly introduced black rats and domestic cats on Torishima Island. Sharks are possible pelagic predators of this albatross as well (63 FR 211).

4.1.2.5 Population Status

Currently, the short-tailed albatross is listed as endangered throughout its range under the 1973 Endangered Species Act. Alaska also lists the short-tailed albatross as endangered under the State of Alaska list of endangered species. The current world population of the short-tailed albatross is estimated to be 500 to 1000 individuals.

4.1.2.6 Critical Habitat

Critical habitat, as defined in Section 3 of the ESA, has not been proposed by the USFWS for the short-tailed albatross. This is based on the USFWS's determination that critical habitat would not benefit the species. Documented critical habitat for the albatross occurs outside U.S. jurisdiction. However, important foraging habitat of the short-tailed albatross under U.S. jurisdiction includes the coastal regions of the North Pacific Ocean and Bering Sea during the non-breeding season and throughout the northwestern Hawaiian Islands during the breeding season. Potential nesting habitat occurs on Midway Atoll in the Hawaiian Islands (63 FR 211).

4.1.2.7 Factors Affecting Survival

The USFWS has identified several factors that could affect the recovery of the short-tailed albatross or exacerbate its decline. The decline in abundance of the short-tailed albatross has been attributed primarily to Japanese entrepreneurs harvesting the birds for flesh and feathers in the late nineteenth century. Japanese ornithologist Yoshimaro Yamashina estimated that at least 5 million albatross were killed between 1878 and 1902 (63 FR 211).

In addition to hunting, natural disasters could contribute to further population decline. Torishima Island, the location of the main breeding colony for the short-tailed albatross, is a volcanic island. The volcano on the island is active and has erupted four times. In 1939, the breeding grounds were buried in a volcanic eruption. The magnitude of habitat destruction potentially caused by an eruption is unknown, although the possibility exists for catastrophic mortality among the 500 breeding birds. Incidental mortality by longline fishing in the North Pacific and Bering Sea is also a possible threat to the species. The magnitude of impacts caused by international longline fisheries has been assessed in a biological opinion by USFWS dated March 19, 1999. However, longline fishing is not thought to threaten the continued survival of short-tailed albatross at the current population size (63 FR 211). In addition, oil contamination can result in physiological problems and can interfere with the bird's ability to thermoregulate (63 FR 211).

A decline caused by any of the above factors may be exacerbated by a lack of genetic diversity in the population with only 500 breeding individuals (64 FR 112). Low genetic diversity can cause a population to become more vulnerable to diseases, habitat loss or degradation and may inhibit recovery.

4.2 Marine Mammals

Five species of endangered marine mammals can be found in lower Cook Inlet, where Forest Oil's Osprey Platform is located. The animals of concern are listed below.

- Steller sea lion (*Eumetopias jubatus*), western stock
- Fin whale (*Balenoptera physalus*)
- Humpback whale (*Magaptera novaeangliae*)
- Blue whale (*Balaenoptera musculus*)
- Northern Right whale (*Eubalaena glacialis*)

In addition, the beluga whale (*Delphinapterus leucas*) is a species of special concern inhabiting Cook Inlet and the project area.

4.2.1 Steller sea lion (*Eumetopias jubatus*), western stock

In 1997, the National Marine Fisheries Service (NMFS) designated the western stock of Steller sea lions (those west of longitude 144) as endangered under the Endangered Species Act (62 FR 30772). Steller sea lions range along the North Pacific Rim from northern Japan to California (Loughlin et al. 1984). The centers of abundance and distribution are located in the Gulf of Alaska and the Aleutian Islands. The species is non-migratory, but individuals may disperse widely and potentially intermingle with animals from other areas (Hill and DeMaster 2000). Juveniles and adult males may visit multiple rookeries and hauling grounds during the winter. During the breeding season, adult females have a limited dispersal (NMFS 1995).

4.2.1.1 Distribution

Steller sea lion habitat includes marine and terrestrial areas. Rookeries are sites where adult animals congregate for pupping and breeding. Rookeries are usually located on beaches of relatively remote islands, often in areas exposed to wind and waves, where access by humans and other mammalian predators is difficult (NMFS 1995). Rookeries may include areas of sand, gravel, cobble, boulder, and bedrock. Rookeries may extend across low-lying reefs and islands or may be restricted to narrow beaches near cliff faces (NMFS 1995).

Haul-outs are areas used by adult sea lions during times other than the breeding season. Nonbreeding adults and subadults use haul-outs throughout the year. Subadult and adult males that are unable to hold territories often occupy haul-outs adjacent to rookery sites. Rookery sites are often used as haul-outs during the non-breeding season (NMFS 1995).

Male and juvenile Steller sea lions disperse widely after the breeding season. During fall and winter in Alaska, sea lions occur at rookeries and haul-out sites that are used during the summer or at locations unoccupied in summer.

4.2.1.2 Life History

Steller sea lions are the largest member of the family *Otariidae* and show pronounced sexual dimorphism with males being significantly larger. At birth, pups weigh from 16 to 23 kg and measure 100 to 120 cm in length (Calkins and Pitcher 1982). Most females reach adult size and maximum skeletal growth by age 6. Males reach maximum size at age 10 to 11, although variability among age classes is high. The average mass of adult males is 566 kg (maximum of about 1,120 kg) and average length is 282 cm. Adult female mass averages 263 kg (maximum of about 350 kg) with an average length of 228 cm (Calkins and Pitcher 1982; Fiscus 1961; Loughlin and Nelson 1986).

Adult female Steller sea lions usually breed annually (Calkins and Pitcher 1982) and reach sexual maturity between 3 and 6 years of age (Mathisen et al. 1962; Pitcher and Calkins 1981). Males reach sexual maturity between 3 and 7 years of age. Females produce a single pup each year. Pups are born from late May to early July. Birth rates based on the number of females pregnant in April and May are about 60% to 75% throughout the range (Calkins and Pitcher 1982; Calkins and Goodwin 1988). Young are usually weaned by the end of their first year but may continue to nurse until age 3 (Lowry et al. 1982).

In the Gulf of Alaska, Steller sea lion mortality from birth to age 3 was estimated at 53%. In age classes 3 through 11 years, the average yearly mortality was 11% and remained close to that level in older age classes (Calkins and Pitcher 1982). There may be some sexual specific differences in mortality, but the trends are not clear. Female sea lions may live to age 30 and males to about 20 years (Calkins and Pitcher 1982).

Steller sea lion pup mortality occurs from drowning, starvation caused by separation from the mother, crushing by larger animals, disease, predation, and biting by females other than the mother (Orr and Poulter 1967; Edie 1977). Juvenile and adult Steller sea lions are eaten by sharks and killer whales but the rates and significance of this predation is not known.

4.2.1.3 Diet

Steller sea lions eat a variety of fishes and invertebrates. Small demersal and off-bottom schooling fishes are the most common prey of sea lions in Alaska. Octopus and squid are also commonly eaten (NMFS 1995). Harbor seals (*Phoca vitulina*), spotted seals (*P. largha*), bearded seals (*Erignathus barbatus*), ringed seals (*P. hispida*), fur seals, California sea lions (*Zalophus californianus)* and sea otters (*Enhydra lutris*) are also occasionally eaten (Tikhimirov 1959; Gentry and Johnson 1981; Pitcher 1981; Pitcher and Fay 1982; Byrnes and Hood 1994). In diet studies conducted since 1975, walleye pollock (*Theragra chalcogramma*) was the principal prey in most areas of the Gulf of Alaska and the Bering Sea. However, Pacific cod

(*Gadus macrocephalus*), octopus, squid, Pacific herring (*Clupea harengus*), capelin (*Mallotus villosus)*, Pacific sand lance (*Ammodytes hexapterus)*, flatfishes, and sculpins were also consumed (NMFS 1995). Analysis of scats collected during 1990 to 1992 in the Aleutian Islands suggests that Atka mackerel (*Pleurogrammus monoterygius*) was the most common prey in the region followed by walleye pollock and Pacific salmon (*Oncorhynchus* spp.) (NMFS 1995). Energy requirements of Steller sea lions are not well known. Keyes (1968) suggested that adult, nonpregnant, nonlactating sea lions require 6% to 10% of their body weight in food per day. However, this estimate was made from feeding rates of captive sea lions and may not reflect the energy requirements of free-ranging animals.

4.2.1.4 Predation

Known predators of Steller sea lions include sharks and killer whales *(Orcinus orca).*

4.2.1.5 Population Status

The most recent estimate of Steller sea lion abundance is based upon aerial surveys during June 1998 and ground-based pup counts in June and July, 1998 (Sease and Loughlin 1999). These surveys suggest a minimum abundance of 39,031 Steller sea lions in the western U.S. stock in 1998. This count estimated 9,373 pups, 28,658 non-pups and included an estimate of 1,000 animals for unsurveyed sites (Hill and DeMaster 2000). These counts have not been corrected to account for animals that were at sea during the surveys.

The first reported trend counts of Steller sea lions in Alaska were made in 1956 to 1960 and indicated that at least 140,000 sea lions reside in the Gulf of Alaska and Aleutian Islands (Kenyon and Rice 1961; Mathisen and Lopp 1963). Counts in 1976 and 1979 estimated 110,000 sea lions and suggested a major population decrease in the Aleutian Islands beginning in the mid 1970s (Braham et al. 1980). The decline appeared to spread eastward to the Kodiak Island area during the late 1970s and early 1980s and to the central and western Aleutian Islands during the early and mid-1980s (Merrick et al. 1987; Byrd 1989). Between 1985 and 1989, large declines (greater than 50%) occurred and by 1990, the decline encompassed all of the area from Prince William Sound to the western Aleutian Islands (NMFS 1995). The largest declines occurred in the eastern Aleutian Islands and western Gulf of Alaska, but declines have also occurred in the central Gulf of Alaska and the central Aleutian Islands. Counts at trend sites from 1990 to 1996 indicate a 27% decline. Counts at trend sites in 1998 suggest that the number of sea lions in the Bering Sea/Aleutian Islands region has declined 7.8% since 1996 (Hill and DeMaster 2000).

4.2.1.6 Critical Habitat

Steller sea lions use specific locations along the coast of Alaska as rookeries and haul-out sites. All sea lion haul-out sites are considered critical habitat because of their limited numbers and high-density use. Alteration of these areas through disturbance or habitat destruction could have a significant impact on the use of these sites by sea lions. Protection measures currently in effect are directed at limiting activities and disturbance of sea lions. These include a 3-nautical-mile no-entry zone around rookeries and haul outs, prohibition of groundfish trawling within 10 to 20 nautical miles of certain rookeries, and spatial and temporal allocation of Gulf of Alaska pollock total allowable catch (50 CFR 226.12). In 1999, measures included: reductions in the removal of Atka mackerel within areas designated as critical habitat in the central and western Aleutian Islands; greater temporal dispersion of the Atka mackerel harvest; further temporal and spatial dispersal of the Bering Sea and Gulf of Alaska pollock fisheries; closure of the Aleutian Islands to pollock trawling; and expansion of the number and extent of buffer zones around sea lion rookeries and haulouts.

Sea lion rookeries in Alaska are located in the Pribilof Islands, on Amak Island north of the Alaska Peninsula, throughout the Aleutian Islands and western Gulf of Alaska to Prince William Sound, and on Forrester Island, White Sisters and Hazy Island in southeast Alaska. Haul-outs are numerous throughout the breeding range.

4.2.1.7 Factors Affecting Survival

Range-wide population surveys suggest that Steller sea lions have not redistributed themselves and that emigration is insufficient to account for the observed declines (Loughlin et al. 1992). This suggests that the proximate cause of the decline must be changes in reproductive or survival rates (NMFS 1995).

Declines in juvenile survival appear to be an important proximate cause of the decline in the Alaskan population of Steller sea lions from the early 1980s to the present. Since 1985, NMFS and Alaska Department of Fish and Game (ADFG) researchers have noted a reduced abundance of juvenile animals on declining rookeries (Merrick et al. 1987; NMFS and ADFG unpublished data, cited in NMFS 1995). York (1994) suggested a 10 to 20% decrease in juvenile (ages 0 to 4) survival in the Kodiak Island population, and Pascual and Adkinson (1994) concluded that juvenile survival could have declined as much as 30% to 60%.

Changes in the early (1 to 2 months) survival of Steller sea lion pups do not explain the decline in juvenile survival (NMFS 1995). Few dead pups are observed on rookeries during annual pup counts and pup mass (Merrick et al. 1994) and physiological studies (Castellini 1993; Rea et al. 1993) indicate that pups in decline areas are as large and healthy as pups in areas not experiencing declines. However, girth and mass of sea lions ages 1 to 10 years old collected in the Kodiak Island area in 1985-1986 were significantly less than in the 1970s (Calkins and Goodwin 1988). These data imply that declines in juvenile survival probably occur after the first months of life (NMFS 1995).

Despite the apparent declines in juvenile survival, the large scale declines which occurred in the Aleutian Islands during the 1970s and from 1985 to 1989 are too large to be caused solely by changes in juvenile survival. NMFS (1995) suggests that acute declines in adult survival were overlaid on an ongoing, chronic decline in juvenile survival.

Changes in reproductive rates do not appear to be important in the decline of Steller sea lion populations (NMFS 1995). Near-term pregnancy rates found in animals in 1985 in the Gulf of Alaska were not significantly different from those found in 1975 to 1978 (Pitcher and Calkins 1981; Calkins and Goodwin 1988). Merrick et al. (1988) indicates that the number of pups relative to the number of females on rookeries remains relatively high and York (1994) suggested that a much larger decrease in fecundity compared to juvenile survival would be required to produce the observed decline in Steller sea lion populations.

Data suggest that the ultimate factor (or factors) that have caused the decline in Alaskan populations of Steller sea lions would have to:

- Heavily reduce juvenile survival;
- Be chronic, rather than acute, since the decline has continued for more than a decade;
- Be widespread because concurrent declines have occurred throughout southwestern Alaska;
- Occasionally manifest itself as an acute large decline in survival of both juvenile and adult animals.

A number of factors do not appear to be important in the decline of Steller sea lion populations, including the effects of toxic materials, parasites, entanglement, commercial and subsistence harvest, disturbance, and predation (NMFS 1992). Factors that remain under consideration are shooting, incidental take in fisheries, disease, and changes in the quantity or quality of the prey base.

4.2.2 Fin Whale (*Balenoptera physalus*)

4.2.2.1 Distribution

Fin whales are migratory and range from subtropical to arctic waters. The summer distribution of fin whales extends from central California to the Chukchi Sea. In Alaskan waters, some whales spend the summer feeding in the Gulf of Alaska, while others migrate farther north. Bering Sea fin whales appear to divide into two groups (Morris 1981). One group, consisting mainly of mature males and females without calves, follows the shelf break zone to Cape Navarin (Morris 1981). A second group, mainly juveniles and lactating females, remains in the region north of Unimak Pass (Morris 1981). Fin whales feed throughout the Bering and Chukchi Seas from June through October. Other summer feeding concentration areas occur along upwelling fronts and include the areas southwest of St. Matthews Island and south of the Aleutian Islands (Nasu 1966). Fin whales occur primarily in high-relief areas where biological productivity is probably high (Brueggeman et al. 1988).

Fin whales winter in subtropical to temperate waters off the coast of California. Migration southward begins in September and extends through November. The winter distribution extends from central California to Baja California (around 20º N latitude), where much of the population is thought to winter far offshore (Leatherwood et al. 1982). A few animals may remain in Alaskan waters in the Navarin Basin (Brueggeman et al. 1984). Northward migration begins in spring with migrating whales entering the Gulf of Alaska from early April to June (MMS 1996).

Most sightings of fin whales in southcentral Alaskan waters have been documented in the Shelikof Strait, near Kodiak Island and lower Prince William Sound (Montgomery Watson

1993). Authenticated sightings of fin whales are rare in Cook Inlet as most documentation has been based on carcass sightings (M. Eagleton, NMFS, pers. comm.)

4.2.2.2 Life History

Fin whales usually breed and calve in the warmer waters of their winter range. Peak breeding season occurs between November and February, but can occur in any season (Tomilin 1967; Ohsumi 1958).

4.2.2.3 Diet

The diet of fin whales consists of euphausiids, copepods, fish and squid. Euphausiids are consumed from July to September when large swarms form over the continental shelf margin where upwelling occurs (Nemoto 1970). Nemoto (1959) suggested that copepods are an important food item in spring and early summer when water temperatures are low, but that later in the year euphausiids are of greater importance. Fin whales also eat a wide variety of fish including herring, capelin, pollock, and arctic cod. Tomilin (1967) reported that 97% of the diet of 156 fin whales taken on the continental shelf was fish (primarily pollock). Their diet appears to vary from year to year and from location to location depending on prey abundance (Lowry et al. 1982).

4.2.2.4 Population Status

Based on population modeling, it is estimated that the North Pacific population ranged from 42,000 to 45,000 individuals before the advent of modern whaling. The population of fin whales was reduced to between 14,620 to 18,630 individuals by the time commercial whaling ended (Ohsumi and Wada 1974). North Pacific fin whales have been protected from commercial whaling since 1976. Reliable current abundance estimates of fin whales are not available (Hill and DeMaster 2000). A survey conducted in August 1994 covering 2,050 nautical miles of trackline south of the Aleutian Islands encountered only four fin whale groups (Forney and Bownell 1996). However, this survey did not include all of the waters off Alaska where fin whale sightings have been reported. Information on current trends in the population numbers of fin whales is not available (Hill and DeMaster 2000). There are no published reports that indicate recovery of this stock has or is taking place (Braham 1992; Hill and DeMaster 2000).

4.2.2.5 Critical Habitat

No critical habitat in Alaska has been designated for this species.

4.2.2.6 Factors Affecting Survival

There have been no reports of incidental mortality of fin whales related to commercial fishing operations in the North Pacific during this decade, nor have subsistence hunters in Alaska and Russia reported take of fin whales from this stock (Hill and DeMaster 2000). Hill and DeMaster (2000) concluded that the annual rate of human-caused mortality and serious injury appears minimal for the fin whale.

4.2.3 Humpback Whale (*Magaptera novaeangliae*)

4.2.3.1 Distribution

The humpback whale is distributed worldwide, though it is less common in Arctic waters (Hill and DeMaster 2000). Most humpback whales occur in temperate and tropical waters (between 10^{o} and 23^{o} latitude north and south) during winter. Humpback whales in the North Pacific are seasonal migrants that feed in the cool, coastal waters of the western United States, western Canada, and the Russian far east (NMFS 1991a). The historic feeding range of the humpback in the North Pacific included coastal and inland waters around the Pacific rim from Point Conception, California north to the Gulf of Alaska and the Bering Sea, and west along the Aleutian Islands to the Kamchatka Peninsula and into the Sea of Okhotsk (Nemoto 1957, Tomilin 1967, Johnson and Wolman 1984). Sightings of humpbacks are rare in Cook Inlet, although they are common around the Barren Islands, south of Cook Inlet, in the summer months (M. Eagleton, NMFS, pers. comm.).

4.2.3.2 Life History

Humpback whale summer feeding grounds extend from central California and Washington State, through Southeast Alaska and the Aleutian Islands to the Bering and Chukchi seas. In the Bering Sea, most sightings have been recorded near Unimak Pass, the eastern Aleutian Islands, and the outer shelf east of the Pribilof Islands. In the Gulf of Alaska, concentration areas include the Portlock and Albatross Banks and the eastern Aleutian Islands, Prince William Sound, and the inland waters of southeast Alaska (Berzin and Rovnin 1966). Breeding and calving occur on the wintering grounds and most births occur between January and March (Johnson and Wolman 1984).

4.2.3.3 Diet

The diet of humpback whales consists of euphausiids, amphipods, mysids, and small schooling fish including Pacific herring, capelin, anchovies, sardines, cod, and sand lance (Wolman 1978; Wing and Krieger 1983). Humpback whales are thought to feed mainly during the summer period. Wolman (1978) reported that stomachs examined during the winter months in coastal or subtropical waters of both hemispheres were generally empty. Feeding occurs at the surface or in the midwater regime. Humpbacks capture food items by engulfing their prey or by laterally feeding at the surface.

4.2.3.4 Population Status

In the past, the humpback whale population in much of this range was greatly reduced by intensive commercial whaling (Hill and DeMaster 2000). Currently, surveys indicate at least three relatively separate populations that migrate between their respective summer/fall feeding areas to winter/spring calving and mating areas (Calambokidis et al. 1997, Baker et al. 1998). The Western North Pacific stock spends winter and spring in waters off Japan and migrates to the Bering Sea and Aleutian Islands in the summer and fall (Berzin and Rovnin 1966, Nishiwaki

1966, Darling 1991). The California/Oregon/Washington and Mexico stock winters in coastal Central America and Mexico, migrating to the coast of California to British Columbia in summer and fall (Calambokidis et al. 1989, Steiger et al. 1991, Calambokidis et al. 1993). The Central North Pacific Stock winters in the Hawaiian Island waters and migrates to northern British Columbia/Southeast Alaska and Prince William Sound west to Kodiak Island (Baker et al. 1990, Perry et al. 1990, Calambokidis et al. 1997). Some exchange of stocks between winter/spring areas has been documented, as well as movement between Japan and British Columbia and Japan and the Kodiak Archipelago (Darling and McSweeney 1985, Baker et al. 1986, Darling and Cerchio 1993, Darling et al. 1996, Calambokidis et al. 1997).

The North Pacific humpback whale population was estimated at between 1,400 and 2,000 individuals in 1991 (NMFS 1991a). Prior to commercial whaling, an estimated 15,000 humpbacks inhabited the North Pacific. Current estimates for the western North Pacific humpback whale stock (the stock most likely utilizing the Cook Inlet area) is 394 animals (NMFS 2000a). Reliable information on trends in abundance for the western North Pacific Stock is currently not available (Hill and DeMaster 2000). Barlow and Clapham (1997) have estimated a population growth rate of 6.5% for humpback whale populations in the Gulf of Maine. However there are no similar estimates for humpback whale populations in the North Pacific (Best 1993). Wade and Angliss (1997) recommend a maximum net productivity rate of 4% for this stock.

4.2.3.5 Critical Habitat

No critical habitat in Alaska has been designated for this species.

4.2.3.6 Factors Affecting Survival

Reliable information on the trends in abundance for the Western North Pacific humpback whale is not available. No commercial fishery-related mortalities have been observed during 1990 to 1997 monitoring. The annual estimated mortality rate due to commercial fisheries is 0.2 whales per year. However, this is considered a minimum rate since no data are available from Japanese, Russian, or international waters (Hill and DeMaster 2000).

4.2.4 Blue Whale (*Balenoptera musculus*)

4.2.4.1 Distribution

Blue whales are present in the waters off California to Alaska during the summer. Compared to other large cetaceans, the blue whale migration is more limited in northern waters. Modern whaling data suggest that blue whale abundance peaks in the eastern Gulf of Alaska in July and near the eastern Aleutian Islands in June (Rice 1974). Marking studies found little movement of blue whales while they were on their feeding grounds (Morris et al. 1983). Blue whales occur in relative abundance in a narrow area just south of the Aleutian Islands from 160° W to 175° W longitude (Berzin and Rovnin 1966, Rice 1974). The species is also distributed in an area north of 50° N latitude extending from southeastern Kodiak Island across the Gulf of Alaska and from southeast Alaska to Vancouver Island (Berzin and Rovnin 1966).

4.2.4.2 Life History

Blue whales usually begin migrating south out of the Gulf of Alaska by September (Berzin and Rovnin 1966). Migration routes are thought to be along the western coast of North America. The North Pacific blue whale population winters from the open waters of the mid-temperate Pacific south to at least 20º N latitude (MMS 1996). Leatherwood et al. (1982) reported that blue whales occur up to 1,300 to 2,800 km offshore of Central America and at least as far south as Panama.

The northward spring migration of the North Pacific population begins in April or May, with whales traveling along the American shore of the Pacific (Berzin and Rovnin 1966). Blue whales are sighted off Baja California and the Mexican mainland in February, with peak densities occurring in April. Mating and calving take place over a five-month period during the winter (Mizroch et al. 1984).

4.2.4.3 Diet

The diet of blue whales consists primarily of krill, small euphausiid crustaceans, primarily on their summer range (Nemoto 1959, Berzin and Rovnin 1966).

4.2.4.4 Population Status

It is estimated that prior to exploitation by commercial whaling, there were about 4,900 to 6,000 blue whales in the North Pacific. The most recent estimate of the North Pacific blue whale population was approximately 1,700 individuals (Barlow and Gerrodette 1996). There have been many reported sightings off the coast of Mexico and California but no reliable census data are available for population estimates. Currently, it is unknown whether the blue whale population is increasing, decreasing, or stable (MMS 1996).

Whaling records indicate that large concentrations of this species once occurred in the northern part of the Gulf of Alaska southwest of Prince William Sound in the Port Banks area (Nishiwaki 1966) and in an area west of the Queen Charlotte Islands and southeast Alaska (Berzin and Rovnin 1966). Recent sightings in Alaskan waters have been scant (MMS 1996).

4.2.4.5 Critical Habitat

No critical habitat in Alaska has been designated for this species.

4.2.4.5 Factors Affecting Survival

There is relatively little information on the abundance or mortality of blue whales since hunting ceased in 1967 (MMS 1996). Given the low number of opportunistic sightings, the low population estimates relative to their initial abundance, and the low intrinsic rate of increase for most baleen whale populations, it is unlikely that blue whale populations are recovering (Mizroch et al. 1984).

4.2.5 Northern Right Whale (*Eubalaena glacialis*)

4.2.5.1 Distribution

Historically, right whales ranged across the entire North Pacific north of 35° N latitude. Commercial whalers hunted right whales nearly to extinction during the 1800s. Before this exploitation, concentrations were found in the Gulf of Alaska, eastern Aleutian Islands, southcentral Bering Sea, Sea of Okhotsk, and the Sea of Japan (Braham and Rice 1984). Sightings have been reported as far south as Baja California in the eastern North Pacific, as far south as Hawaii in the central North Pacific, and as far north as the subarctic waters of the Bering Sea and Sea of Okhotsk in the summer (Herman et al. 1980; Berzin and Dorshenko 1982; NMFS 1991b).

4.2.5.2 Life History

Northern right whales are baleen whales that can grow up to 50 feet in length. These large, slow-swimming whales tend to congregate in coastal waters. Little is known about the life history of the right whale. No calving grounds have ever been found in the eastern North Pacific (Scarff 1986). Consequently, right whales are thought to calve in southern coastal waters of their distribution during the winter months (Scarff 1986). Scarff (1986) hypothesized that right whales summering in the eastern North Pacific mate, calve, and overwinter in the mid-Pacific or western North Pacific. The migration patterns of the North Pacific stock are also unknown. During summer, it is assumed that right whales migrate to their feeding grounds in the higher latitudes of their range. In winter, they migrate to the more temperate waters (Braham and Rice 1984).

4.2.5.3 Diet

The diet of right whales is primarily zooplankton, calanoid copepods, and euphausiids (MMS 1996).

4.2.5.4 Population Status

Pre-exploitation abundance estimates for right whales in the North Pacific stock exceeded 11,000 individuals (NMFS 1991b). The most current population estimate of right whales is 100 to 200 individuals in the North Pacific (Wada 1973). It is unknown whether the population has increased, decreased, or remained stable since this estimate was calculated; a current reliable estimate of the abundance for the North Pacific right whale stock is not available (Hill and DeMaster 2000).

Sightings of right whales are extremely rare. From 1958 to1982 there were only 32 to 36 sightings of right whales in the central North Pacific and Bering Seas (Braham 1986). In the eastern North Pacific south of 50° N, only 29 reliable sightings were recorded between 1900 and 1994 (Scarff 1986, Scarff 1991, Carretta et al. 1994). In 1996 a right whale was sighted off Maui (Hill and DeMaster 2000) and a group of 3 to 4 right whales were sighted in Bristol Bay. This latter group was thought to include a juvenile (Goddard and Rugh 1998). In 1997, a group of 5 to 9 individuals was seen in approximately the same Bristol Bay location (Hill and DeMaster 2000).

4.2.5.5 Critical Habitat

Little information exists on the natural history of right whales. Consequently, the location and type of critical habitat for right whales is unknown due to the rarity of this species.

4.2.5.6 Factors Affecting Survival

Due to the lack of information on right whales and their rarity, the factors that affect the survival of right whales are not known. Consequently, the annual estimated rate of human-caused mortality and serious injury is thought to be minimal for this stock and there are no known habitat issues of concern (Hill and DeMaster 2000).

4.2.6 Cetacean of Special Concern – Beluga Whale (*Delphinapterus leucas*)

4.2.6.1 Distribution

The beluga whale is a long-lived, medium-sized, toothed cetacean (ADFG 1999). Beluga whales are distributed throughout seasonally ice-covered arctic and subarctic waters of the Northern Hemisphere (Gurevich 1980). Based on mitochondrial analysis, five separate stocks of belugas are recognized in Alaskan waters: 1) Cook Inlet, 2) Bristol Bay, 3) Eastern Bering Sea, 4) Eastern Chukchi Sea, and 5) Beaufort Sea (Hill and DeMaster 2000).

4.2.6.2 Life History

Adult belugas are sexually dimorphic with males ranging from 11 to 15 feet and weighing between 1,000 and 2,000 pounds (ADFG 1999). Adult females are smaller, averaging slightly more than 10 feet (Morris 1992), but usually less than 12 feet (ADFG 1999). They have a blubber layer which can be 5 inches thick (ADFG 1999) and are the only species of whale that can bend its neck, which is thought to be an adaptation to maneuvering and catching prey in silty, ice-covered waters (ADFG 1999). This species is unique, being the only known whale species that molts its skin on an annual basis (Huntington et al. 1999).

Information on breeding and reproduction specific to the Cook Inlet belugas is generally lacking. However, some information can be inferred from studies of other parts of the beluga range. The average age at sexual maturity is estimated to be 5 or 6 years and breeding takes place triennially in early spring (Calkins 1989; ADFG 1999). Breeding can occur as early as February, but generally occurs from March through April (Morris 1992; ADFG 1999). Gestation is estimated between 14 and 15 months with calving occurring from May through July (ADFG 1999). Belugas usually give birth to one calf at a time. The lactation period of these mammals has been estimated at between one and two years with an average of 23 months (Morris 1992). Calves may begin to take their first prey between months 12 and 18 while continuing to nurse (Morris 1992). Calves normally take smaller prey, such as shrimp, when they begin to forage for themselves (Morris 1992).

4.2.6.3 Diet

Beluga whales feed seasonally on a variety of fishes, shrimps, squids, and octopus (Burns et al., 1985). Fish species that belugas feed on during the summer include salmon, herring, eulachon (*Thaleichthys pacificus*), capelin, smelt, and arctic cod (*Boregadus saida*) (Calkins 1989). Pacific tomcod (*Microgadus proximus*) may be an important food source for Cook Inlet belugas in autumn and winter when salmon and eulachon are not available (Calkins 1989).

Large groups of belugas congregate at river mouths in the upper drainages of Cook Inlet to feed on migrating prey species, such as the eulachon and salmon (Morris 1992). Belugas generally feed in the upper 30 feet of the water column (Morris 1992), with most feeding dives are thought to be between depths of 20 and 100 feet and to last 2 to 5 minutes (ADFG 1999).

4.2.6.4 Predation

The killer whale is the beluga whale's only natural predator. Killer whales are common visitors to Cook Inlet and have been known to pursue belugas in the Inlet (M. Eagleton, NMFS, pers. comm.).

4.2.6.5 Population Status

Due to their population decline, the Cook Inlet stock of beluga whales was listed as depleted under the Marine Mammal Protection Act (MMPA) on May 31, 2000 (65 FR 105; 50 CFR 216.15). Upon further investigation, on June 22, 2000, NMFS denied a petition to list the Cook Inlet stock of belugas as endangered (65 FR 21).

Estimates of the world beluga population range between 40,000 and 55,000, while current estimates in Alaska and western Canadian Beaufort Sea stock range between 21,000 and 39,258 individuals (Duval 1993; Harwood et al. 1996).

Beluga surveys in Cook Inlet have concentrated on the upper inlet during periods when belugas congregate at the mouths of the rivers for calving or feeding (Morris 1992). Whales can only be counted as they surface because of the turbid water in upper Cook Inlet. Therefore, the population estimate is based on assumptions of the numbers of unseen animals. The Cook Inlet stock was first surveyed in 1964 and 1965 by the Alaska Department of Fish and Game (ADFG). The ADFG estimated a minimum of 300 to 400 whales sighted (Calkins 1989). In 1979, 1982, and 1983, Calkins performed extensive aerial surveys of the inlet and reported sighting as many as 479 in 1979 (Morris 1992). However, Calkins (1989) did not survey to estimate the abundance of beluga whales in the entire Cook Inlet region

A multi-year study supported by the National Marine Mammal Laboratory, which began in 1993, reported that virtually all sightings were within one kilometer of shore in upper Cook Inlet (Withrow et al. 1994). Surveys between 1994 and 1999 produced abundance estimates of 653, 491, 594, 440, 347, and 357 whales, respectively (65 FR 105). These numbers suggested a more than 40 percent drop in population size over the last 6 years. Beluga distribution data also suggest a reduction in offshore sightings in both upper and lower Cook Inlet (Rugh et al. 2000).

There were 184 individuals during the 2000 Cook Inlet beluga whale surveys (Rugh et al. 2000). This was the lowest median raw count (the number of whales actually observed and not corrected for missed whales) of belugas since NMFS initiated Cook Inlet beluga surveys. These statistics raise concern about the long-term health and viability of the Cook Inlet stock.

4.2.6.6 Habitat

Belugas are sighted most often in coastal and continental shelf waters. They frequent bays, estuaries and river mouths (Sheldon 1993). The immensity of Cook Inlet and its high productivity provide ideal habitat for the Cook Inlet stock of belugas. The shallow, upper inlet is demarcated by the Forelands which constrict the flow of water into and out of the upper inlet (Sheldon 1993), thus providing warmer waters early in the spring, and may restrict beluga access during ice cover in the winter months. Tidal swirls and rips are common throughout the inlet and, coupled with the large tidal ranges, complex circulation patterns are formed particularly in the lower inlet (Sheldon 1993). These contribute to the generally ice-free status of the lower inlet in winter, providing winter habitat for the beluga stock.

Beluga whales occupy different parts of Cook Inlet in different seasons (Sheldon 1993). Belugas have been observed regularly in Cook Inlet from March through November (Morris 1992). Although the population is thought to use the lower inlet during winter months (Calkins 1989) due to ice cover in the upper inlet (Sheldon 1993), no sightings have been recorded between the months of December and February (Morris 1992), and little effort has been directed during this time of year as well. As the ice recedes in the early spring, belugas move into the upper inlet (Sheldon 1993). Concentrations occur nearshore in the northwestern upper inlet from April through June (Calkins 1989), with the largest counts of belugas during May and June (Morris 1992), particularly between West Foreland and Knik Arm (Sheldon 1993). Withrow et al. (1994) report large aggregations of up to 260 near the mouths of the rivers.

By August, beluga concentrations disperse along the coastline of the upper and central inlet. Groups of less than 10 animals dispersed along the coastline north of Kalgin Island were reported in late September (Withrow et al. 1994). With the return of ice in late fall, the population likely moves into the lower inlet (Sheldon 1993), although it appears that some belugas remain in the upper Cook Inlet during the winter if conditions are appropriate. The tracking of two satellite-tagged belugas (tracking data available at http://nmml.afsc.noaa.gov/CetaceanAssessment/BelugaTagging/2000_Folder/2000_beluga_whale_tagging.htm) during November to December 2000 indicate that these whales are spending a portion of the winter in upper Cook Inlet in Knik Arm and Chickaloon Bay (NMFS 2000b).

4.2.6.7 Factors Affecting Survival

The principal disturbances to beluga distribution are reported to include: 1) commercial fishing, 2) industrial development, 3) proximity to human settlement, and 4) hunting.

Current data on mortality and serious injury from fishery-related activities are not available for the Cook Inlet stock of beluga whales. It is currently thought that commercial fisheries in Cook Inlet have little, if any, interaction with belugas. In Cook Inlet, belugas may contact purse seines, drift gillnets, and set gillnets. Between 1981 and 1983 in Cook Inlet, an estimated 3 to 6 belugas per year were killed from interactions with fishing gear (Burns and Seaman 1986). Self-reports of beluga mortalities from commercial fishermen throughout the 1990s were considered incomplete and unreliable (Hill and DeMaster 2000). Since 1999, observers have been used to document beluga mortalities from the Cook Inlet gillnet fisheries. No beluga mortalities have been observed during the observer program (Hill and DeMaster 2000).

In Cook Inlet, over 50 percent of the human population lives on or near the shoreline of the beluga summer range (Morris 1992). Industrialization and increased size of human settlement bring a host of potential disturbances. Most industries and municipalities discharge wastewater to the inlet. Cook Inlet supports 13 offshore oil production platforms, one onshore petroleum refinery and one natural gas facility, which are serviced by large tankers (Morris 1992). Belugas may habituate to the routine noises of the platform operations, but may avoid the noise of the tankers, particularly in summer (Huntington et al. 1999). Frost and Lowry (1990) indicate that aircraft noise can also influence whale distribution and behavior. When aircraft fly below an altitude of about 300 feet, belugas have been observed to swim rapidly away from the source (Withrow et al. 1994). Municipalities, as well as the industries that discharge to the inlet, provide various levels of wastewater treatment, which may or may not remove contaminants that impact the beluga population.

The decline of Cook Inlet belugas has been primarily attributed to subsistence harvest by Alaska Natives. Mean annual subsistence take of beluga whales from the Cook Inlet stock averaged 87 whales between 1993 and 1997. Currently, there is a moratorium on harvesting Cook Inlet belugas. Future harvest levels have yet to be determined. Because of extremely low population numbers, cumulative harvest over years will affect the recovery rate of the Cook Inlet population. During 1998, local Alaska Native organizations and NMFS began to formalize a specific agreement for management of the Cook Inlet beluga stock; however, no formal agreement has yet been signed.

5.0 IMPACTS OF THE PROPOSED ACTION

In the analysis of the possible impacts of wastewater discharge from Forest Oil's Osprey Platform in the Redoubt Shoal Development Area, all direct, indirect, and cumulative impacts on threatened and endangered species or their critical habitat were assessed. The following were specifically considered:

- the proximity of the action to the species and the critical habitat,
- the distribution of where the actions may occur,
- the timing of the action and its relationship to sensitive periods in the life cycle of the various endangered species,
- the nature of the action and its associated effects,
- the duration of the action and its associated effects, and
- if impacts were associated with an action, the frequency, intensity, and severity of the impacts.

5.1 DEFINITION OF THE ACTION AREA

The action area for this project is the water immediately around Forest Oil's Osprey Platform, in the Forelands area of central Cook Inlet, Alaska (60º 41' 46" N latitude and 151º 40' 10' W longitude) [Figure 2]. The platform is located 1.8 miles southeast of the tip of the West Foreland, Alaska.

5.2 POTENTIAL IMPACTS ON BIRDS

5.2.1 Steller's eider

5.2.1.1 Abundance, Distribution and Habitat Use in Project and Action Area

Few Steller's eiders are expected to occur within the action area. The action area for the offshore Osprey Platform, situated on the western side of Cook Inlet, is not located within preferred habitat or proposed critical Steller's eider habitat. Currently, portions of lower Cook Inlet on the eastern side (Kachemak Bay, north to Ninilchik) and the western side (the marine waters from Chinitna Point south to Cape Douglas) are proposed as critical wintering habitat for Steller's eiders. Eiders may occur in the project area as occasional visitors during the winter months.

Little information exists on the abundance and distribution of Steller's eiders in the West Foreland area of lower Cook Inlet. Steller's eiders have wintered in Kachemak Bay and further north along the eastern side of Cook Inlet (Balogh 1999). This area is considered critical wintering habitat for Steller's eiders. Balogh (1999) also indicated that no Steller's eiders have been observed near the project area in recent years, but that a limited number of eider surveys have been conducted on the western side of Cook Inlet. The most recent observations of Steller's eiders in Cook Inlet reported approximately 1,000 Steller's eiders south of Ninilchik in

1999 (T. Antrobus, USFWS, pers. comm.). In 1997, 650 individuals were seen in the same area near Ninilchik. USFWS plans to conduct Steller's eiders surveys during early 2001 to ascertain abundance and distribution of Steller's eiders in Cook Inlet.

5.2.1.2 Timing of Habitat Use in the Action Area

Steller's eiders can be present in lower Cook Inlet during the winter months (Balogh 1999). On the eastern side of the Kodiak Archipelago, peak observation of eiders occurred in December, although eiders were present from October through March (ENRI 1998; Wilbor and Tande 1998). Numbers decline as winter progresses and eiders begin their northern migration to staging/feeding and eventually nesting grounds (King and Lanctot 2000). It is thought that some sub-adults may remain on wintering grounds or along the migration route during the summer breeding season (65 FR 49), although this has not been documented in Cook Inlet.

5.2.1.3 Direct Impacts

Production at the Osprey Platform will increase wastewater discharges (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry; Section 2.2) into Cook Inlet. These permitted discharges are typically low volumes of clean freshwater or seawater, which contain small amounts of added substances. Exposure to this discharge is the primary concern for Steller's eider.

The Osprey Platform will discharge its operational wastewaters on site, outside of any critical habitat for Steller's eiders. No concentrations of eiders are expected in the project area. Steller's eiders are only occasional winter visitors around the western side of Cook Inlet. During the winter months the amount of discharge from the Osprey Platform should be minimal and no displacement of, or direct impacts to eiders is expected from waste stream discharges.

5.2.1.4 Indirect Impacts

Of the wastewater discharges (e.g. deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry), sanitary waste is the most likely to create an indirect impact to Steller's eiders. The low concentrations of nutrients in the sanitary waste discharge may stimulate primary productivity and enhance zooplankton production, although the impact will probably be negligible. The total residual chlorine (the only toxic contaminant of concern) will be discharged at concentrations that meet water quality criteria designed to protect both human health and aquatic life. Other discharged wastewaters will comply with water quality standards for the state of Alaska (18 AAC.70). There should be no indirect adverse impacts to Steller's eiders from the discharge of wastewaters from the Osprey Platform.

5.2.1.5 Cumulative Impacts

Cumulative impacts of discharges (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry) from the Osprey Platform should have negligible effects for Steller's eider. The volume of discharge appears to be minimal as stated under Forest Oil's NPDES permit application. In addition, wastewater discharges of similar quality from other oil and gas platforms in Cook Inlet; and municipal waste streams from Anchorage, Homer, Kenai, and other smaller cities are released into Cook Inlet as well. Given the minimal nature of the discharges from the Osprey Platform, its contributions to the cumulative loading in Cook Inlet are anticipated to be negligible. The volume and concentration of pollutants in the discharges from the Osprey Platform are minimal. All contaminants of concern will be discharged at concentrations that meet the water quality criteria and the requirements of the NPDES General Permit for Oil and Gas Production Platforms in Cook Inlet (EPA 1999). Once released, the strong tidal fluxes associated with Cook Inlet and the West Foreland area will disperse discharges very rapidly (Haley et al. 2000). Thus, there would be no cumulative impacts to Steller's eiders expected to occur from the discharges associated with the Osprey Platform.

5.2.1.6 Conclusions

Wastewater discharges associated with the Osprey Platform are not likely to directly or indirectly affect Steller's eiders, nor is the action likely to adversely affect or jeopardize the threatened Alaska nesting population or its critical habitat. The actions are also not likely to have incremental effects resulting in a cumulative impact to Steller's eiders or their proposed critical habitat.

5.2.2 Short-tailed Albatross

Annual observations of the short-tailed albatross, a pelagic seabird, have been recorded in the Gulf of Alaska and the North Pacific since 1947. The short-tailed albatross has not been observed in the coastal waters of Cook Inlet since observations began (1947 through 1999) (AKNHP 2000; IPHC 1999). Therefore, wastewater discharges associated with the offshore Osprey Platform will not likely have any direct, indirect, or cumulative impacts on the short-tailed albatross. Neither will it jeopardize the recovery of this species.

5.3 POTENTIAL IMPACTS ON MARINE MAMMALS

5.3.1 Steller sea lion

5.3.1.1 Abundance, Distribution and Use of Habitat in the Project and Action Area

Although no rookeries or haul-out sites have been identified in the immediate project or action area, Steller sea lions may range and forage throughout Cook Inlet during salmon runs (Smith 1999). For example, one male Steller sea lion was observed at the mouth of the Susitna River (M. Eagleton, NMFS, pers. comm.). However, only a small number of animals are present at any particular time and they would not be present in any concentrations in the Redoubt Shoals area (Smith and Mahoney 1999). The nearest reported Steller sea lion rookery is the Sugarloaf Islands rookery located in the Barren Islands (58° 53.0" N, 152° 2.0" W) approximately 12 miles from the West Foreland (NMFS 2000c). The nearest major Steller sea lion haul-out is located on Ushagat Island (58° 55.0" N, 152° 22.0" W).

5.3.1.2 Direct Impacts

Although Steller sea lions can occur in the project area, wastewaters from the Osprey Platform (e.g. deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry) will be discharged outside of designated Stellar sea lion critical habitat and should not impact Steller sea lion marine habitat in the West Foreland area. It is possible that a small number of Steller sea lions could be present in the West Foreland area during the summer months, but it is unlikely that the discharges offshore would disturb them. Discharges will be diluted by the strong tidal flux of Cook Inlet. Any disturbance that might occur would be very short-term and unlikely to adversely affect Steller sea lions.

5.3.1.3 Indirect Impacts

Of the wastewater discharges (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry), sanitary waste is the most likely to create any indirect impact to Steller's sea lions. The low concentrations of nutrients in the sanitary waste discharge may stimulate primary productivity and enhance zooplankton production, but these effects will probably be negligible. The total residual chlorine (the only toxic contaminant of concern) will be discharged at concentrations that meet water quality criteria designed to protect both human health and aquatic life. All of the wastewater discharges will comply with water quality standards for the state of Alaska (18 AAC.70). No indirect impacts for Steller sea lions are anticipated from the discharge of wastewaters from the Osprey Platform.

5.3.1.4 Cumulative Impacts

Cumulative impacts of discharges (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry) from the Osprey Platform should have negligible effects for the Steller sea lion. The volume of discharges appear to be minimal as stated under Forest Oil's NPDES permit application. In addition, wastewater discharges of similar quality from other oil and gas platforms in Cook Inlet; and municipal waste streams from Anchorage, Homer, Kenai, and other smaller cities, are released into Cook Inlet as well. Given the minimal nature of the discharges from the Osprey Platform, its contributions to the cumulative loading in Cook Inlet are anticipated to be negligible. The volume and concentration of pollutants in the discharges from the Osprey Platform are minimal. All contaminants of concern will be discharged at concentrations that meet the water quality criteria and the requirements of the NPDES General Permit for Oil and Gas Production Platforms in Cook Inlet (EPA 1999). Once released, the strong tidal fluxes associated with Cook Inlet and the West Foreland area will disperse discharges very rapidly (Haley et al. 2000). Thus, there would be no cumulative impacts to Steller sea lion expected to occur from the discharges associated the Osprey Platform.

5.3.1.5 Conclusions

Wastewater discharges associated with the Osprey Platform are not likely to directly or indirectly affect Steller sea lions, nor is the action likely to adversely affect or jeopardize the threatened Alaska population or its critical habitat. The actions are also not likely to have incremental effects resulting in a cumulative impact to Steller sea lions or their proposed critical habitat.

5.3.2 Endangered Cetaceans

All of the endangered whale species being considered in this biological assessment (the humpback, fin, blue, and northern right whales) will be discussed as a group for simplicity. The impacts of the proposed action will be similar for all of the species concerned.

5.3.2.1 Abundance, Distribution and Use of Habitat in the Project and Action Area

The four whale species could be present in the lower Cook Inlet area and any observations would most likely be located near the entrance to Cook Inlet (Smith 1999). Most documentation of larger whales in Cook Inlet comes from historic records, mainly strandings (M. Eagleton, NMFS, pers. comm.). Historic data suggests that small numbers of humpback and fin whales have been observed in portions of lower Cook Inlet on occasion during the summer months and have been documented within one mile from shore (MMS 1996). Furthermore, humpback and fin whales would not be found regularly above Kachemak Bay (Smith and Mahoney 1999). During the summer of 2000, humpbacks were observed around the entrance of Cook Inlet, near the Barren Islands. Blue and northern right whales would be only accidental visitors in lower Cook Inlet. The project and action areas are located outside of critical habitat for all of the endangered whale species.

5.3.2.2 Direct Impacts

Wastewaters from the Osprey Platform in Cook Inlet (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry) will be discharged outside of critical and high use habitat for the humpback, fin, blue, and northern right whales. In general, humpback and fin whales are not present in the Forest Oil project area and no impacts are anticipated. Wastewater discharges would not likely influence marine habitat for whales in Cook Inlet either. Although the platform will be operated year-round, activities and sightings of these larger whales in Cook Inlet and the Gulf of Alaska waters would generally occur during the summer months. Thus, in the event that individual whales migrate into Cook Inlet waters, it is unlikely that wastewater discharges from the platform would disturb them. Any disturbance that did occur would be very short-term and unlikely to adversely affect the animals.

5.3.2.3 Indirect Impacts

Of the wastewater discharges (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry), sanitary waste is the most likely to create any indirect impact to humpback, fin, blue, and northern right whales. The low concentrations of nutrients in the sanitary waste discharge may stimulate primary productivity and enhance zooplankton production but will probably have a negligible effect. The total residual chlorine (the only toxic contaminant of concern) will be discharged at concentrations that meet the water quality criteria designed to protect both human health and aquatic life. Other discharged wastewaters will also comply with water quality standards for the state of Alaska (18 AAC.70). There will be no indirect adverse impacts to humpback, fin, blue, and northern right whales from the discharge of wastewater from the Osprey Platform.

5.3.2.4 Cumulative Impacts

Cumulative impacts of discharges (e.g. deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry) from the Osprey Platform should have negligible effects for humpback, fin, blue, and northern right whales. The volume of discharges appear to be minimal as stated under Forest Oil's NPDES permit application. In addition, wastewater discharges of similar quality from other oil and gas platforms in Cook Inlet; and municipal waste streams from Anchorage, Homer, Kenai, and other smaller cities are released into Cook Inlet as well. Given the minimal nature of the discharges from the Osprey Platform, its contributions to the cumulative loading in Cook Inlet are anticipated to be negligible. The volume and concentration of pollutants in the discharges from the Osprey Platform are minimal. All contaminants of concern are discharged at concentrations that meet the water quality criteria and the requirements of the NPDES General Permit for Oil and Gas Production Platforms in Cook Inlet (EPA 1999). Once released, the strong tidal fluxes in Cook Inlet and the West Foreland area will disperse discharges very rapidly (Haley et al. 2000). Thus, there would be no cumulative impacts to endangered whales expected to occur from the discharges associated the Osprey Platform.

5.3.2.5 Conclusions

Discharges from Forest Oil's Osprey Platform in the Redoubt Shoal Development Area is not likely to directly or indirectly impact any of the four endangered whale species (humpback, fin, blue, or northern right whales), nor is the action likely to adversely affect or jeopardize the endangered Alaska populations or their critical habitat. The proposed actions also will not have incremental effects resulting in a cumulative effect on these species.

5.3.3 Beluga Whale

5.3.3.1 Abundance, Distribution and Use of Habitat in the Project and Action Area

Little is known of the habitat use of beluga whales in Cook Inlet. Although beluga whales use portions of Cook Inlet throughout the year, the Forelands area is a natural travel corridor between upper Cook Inlet and lower Cook Inlet where belugas pass (NMFS 2000b). The project area is not heavily used by belugas and the Kustatan River does not appear to be as important to belugas as other rivers (Smith and Mahoney 1999), such as the Susitna, the Little Susitna, and Beluga rivers where large concentrations of belugas are present during the summer (NCG 1999).

Beluga whales can be present in the tidal rips near the West Foreland, but these are usually further offshore than the project area (Smith 1999).

5.3.3.2 Direct Impacts

Impacts on beluga whales associated with production activities at the Osprey Platform will be limited to increased exposure to wastewater discharges (e.g. deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry). Discharges will be diluted by the strong tidal flux of Cook Inlet.

Wastewater will be discharged from the Osprey Platform outside areas in Cook Inlet where large concentrations of belugas are present during the summer (NMFS 2000d). Although the platform will be operated year-round, the West Foreland is not heavily used by beluga whales (Smith and Mahoney 1999). It is unlikely that wastewater discharges from the Osprey Platform would affect belugas or their marine habitat. Any impacts from the wastewater discharges would be very short-term and unlikely to adversely affect the whales.

5.3.3.3 Indirect Impacts

Of the wastewater discharges (deck drainage, sanitary wastes, domestic wastes, boiler blowdown, fire control system test water, non-contact cooling water, and excess cement slurry), sanitary waste is the most likely to create any indirect impact to beluga whales. The low concentrations of nutrients in the sanitary waste discharge may stimulate primary productivity and enhance zooplankton production but will probably have a negligible effect. The total residual chlorine (the only toxic contaminant of concern) in the sanitary wastewater will be discharged at concentrations that meet the water quality criteria designed to protect both human health and aquatic life. Other discharged wastewaters will also comply with water quality standards for the state of Alaska (18 AAC.70). There will be no indirect adverse impacts to beluga whales from the discharge of wastewater from the Osprey Platform.

5.3.3.4 Cumulative Impacts

Cumulative impacts of discharges from the Osprey Platform should have negligible effects for beluga whales. The volume of the discharges appears to be minimal as stated under Forest Oil's NPDES permit application. In addition, wastewater discharges of similar quality from other oil and gas platforms in Cook Inlet; and municipal waste streams from Anchorage, Homer, Kenai, and other smaller cities are released into Cook Inlet as well. Given the minimal nature of the discharges from the Osprey Platform, its contributions to the cumulative loading in Cook Inlet are anticipated to be negligible. The volume and concentration of pollutants in the discharges from the Osprey Platform are minimal. All contaminants of concern will be discharged at concentrations that meet the water quality criteria and the requirements of the NPDES General Permit for Oil and Gas Production Platforms in Cook Inlet (EPA 1999). Once released, the strong tidal fluxes associated with Cook Inlet and the West Foreland area will disperse discharges very rapidly (Haley et al. 2000). Thus, no cumulative impacts to beluga whales are expected to occur from the discharges associated with the Osprey Platform.

5.3.3.5 <u>Conclusions</u>

Wastewater discharges from Forest Oil's Osprey Platform in the Redoubt Shoal Development Area is not likely to directly or indirectly impact Cook Inlet beluga whales, nor is the discharge likely to adversely affect or jeopardize the Cook Inlet population or their critical habitat. The proposed actions also should not have incremental effects resulting in a cumulative effect to these species.

5.4 SUMMARY FINDING

Based on the Cook Inlet tidal flux, the anticipated volume of wastewater discharge, and Osprey Platform's contribution to the cumulative loading of waste discharges in Cook Inlet, this Biological Assessment concludes that wastewater discharges from the Osprey Platform will be rapidly diluted and will likely have no adverse effect on the marine mammal and bird species listed in this assessment or critical habitat associated with these species.

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APPENDIX A

CORRESPONDENCE WITH NMFS AND USFWS

U.S. FISH & WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services Anchorage
605 West 4th Avenue, Room 62
Anchorage, Alaska 99501-2249

IN REPLY REFER TO:
WAES

January 12, 2000

Matt Harrington
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

RE: Request for Threatened and Endangered Species List, Forcenergy National Pollutant Discharge Elimination System Permit, Kustatan, Alaska

Dear Mr. Harrington:

On January 7, 2000, we received your request for a list of Federal threatened and endangered species that may occur in the vicinity of the proposed project, Kustatan, Alaska. Therefore, we are providing a list of potential listed species per section 7 of the Endangered Species Act of 1973, as amended. The following species are anticipated to occur in the action area:

Steller's eider	(*Polysticta stelleri*)	T
Short-tailed albatross	(*Phoebastria albatrus*)	E(PE)

This letter relates only to endangered species under our jurisdiction. It does not address species under the jurisdiction of the National Marine Fisheries Service, or other legislation or responsibilities under the Fish and Wildlife Coordination Act, Clean Water Act, or National Environmental Policy Act. Therefore, compliance with other environmental regulations may be appropriate.

If you have any questions regarding this letter please contact me at (907) 271-2781; Fax: (907) 271-2786; e-mail: arthur_davenport@fws.gov.

Sincerely,

Arthur E. Davenport

Arthur E. Davenport
Endangered Species Biologist

UNITED STATES DEPARTMENT OF COMMERC
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

February 14, 2000

RECEIVED
FEB 2
US EPA ...
OFFICE OF W...

Mr. Matt Harrington
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Re: Forcenergy

Dear Mr. Harrington:

Thank you for your letter requesting information on endangered, threatened, or any species of special concern under National Marine Fisheries Service (NMFS) jurisdiction. NMFS offers the following information for your review.

Marine mammals that regularly occur inside Cook Inlet include the western population of Steller sea lion, harbor seal, harbor porpoise, killer whale, and beluga whale. Marine mammals that are occasionally found in lower Cook Inlet waters include the humpback, gray, minke, and fin whales. Of these marine mammals, the Steller sea lion, fin whale, and humpback whale are listed as an endangered species under the Endangered Species Act (ESA). Given their distribution and limited seasonal occurrence in the inlet, none of the ESA listed species should be adversely impacted by your project. Further, critical habitat for the above listed species has not been identified within Cook Inlet or your project area.

The beluga whale is presently listed as a candidate species under the ESA and is proposed as a depleted stock under the Marine Mammal Protection Act (MMPA). We have identified the Cook Inlet beluga whale as a species of special concern and one which we believe justifies specific measures to protect. We offer the following information specific to the beluga whale stock found within Cook Inlet.

The distribution of beluga whales in Cook Inlet based on annual aerial surveys has indicated that all of Cook Inlet is occupied at one time or another throughout the year with major concentrations at the mouths of several anadromous fish streams and rivers such as the McArthur, Kustatan and Drift Rivers. The clustered distribution of the whales at the rivers, the physical characteristics and limited number of large rivers in the inlet, and the availability of concentrated food sources at the mouths of these rivers suggest that these areas provide habitat necessary to the well-being of the beluga.

The beluga whale can be very sensitive to disturbance, and we have often observed pronounced avoidance reactions to surface and in-water noise. Any activity that might disturb or cause these whales to abandon important feeding or calving areas could have adverse and significant consequences and would likely be in violation of the MMPA.

Please direct any further questions or concerns you may have especially regarding Cook Inlet beluga whales to our Anchorage Field Office at (907) 271-5006.

Sincerely,

Ronald J. Berg

For Steven Pennoyer
Administrator, Alaska Region

cc: USFWS, EPA(Rockwell), ADEC(McGee), ADFG, ADGC - Anchorage
Cook Inlet Marine Mammal Council

Matthew.Eagleton@noaa.gov

08/28/2000 11:29 AM

To: Matthew Harrington/R10/USEPA/US

cc: fen5@pcbox.alaska.net, Arthur_Davenport@fws.gov, wintersn@orcalink.com

Subject: Re: esa and efh for force energy

I am not sure if this will help, but may. ESA and EFH are consultations between agencies unless otherwise delegated by the federal agency.

Some differences between ESA and EFH:

ESA:

Federal action agency requests a list from NMFS or other for which T&E species may be found in/near the action along with brief description of the action.

EPA determines no effect or may effect. If no effect, then done. Also, if no adverse effect and want NMFS to concur with this, then we can and have in the past done this.

If a may effect, then BA (or similar) discusses action, determines whether or not there is an adverse effect, and is sent to NMFS or other. However, if BA determines an adverse effect, then we step into a more formal process which may lead to a NMFS Biological Opinion (BO). However, it gets a little "gray" if NMFS disagrees with a no adverse effect determination. In this case, NMFS would probably ask for some discussion with the action agency.

EFH:

Federal action agency investigates which EFH species are in/near action and determines if there may be an adverse effect to EFH (no species list request). If federal action determines no effect, then no EFH Assessment needs to prepared by action agency.

If there is an adverse effect then the EFH Assessment is submitted to NMFS. An EFH Assessment can either be a separate stand alone or folded into environmental document. If copmpleted alone, it must contain the requirements in 50 CFR Part 600. If folded, then it must be referenced as such and contain all the requirements. NMFS must review and offer any EFH Conservation Recommendations to lessen impact, if needed. However, if the action agency determines no effect and NMFS learns of the action through other means, such as a public notice, and feels the action may adversely effect EFH, then NMFS is required to offer EFH Conserve Rec's anyway.

I suspect EPA has determined there may be some effect or a BA would not be at this stage. I agree it would be best to list your determinations for ESA and EFH in whatever NEPA document you prepare. NMFS will review, offer comment and rec's and concur/not concur where needed. Most documents label the ESA sections, I suggest to clearly label the EFH section also.

I apologize if my above review is a repeat, but I feel it helps see the difference between the ESA and EFH. Please let me know if there are any questions.

ATTN: Matthew Harrington

The following preliminary information is per your telephone request regarding Threatened and Endangered species in the vicinity of the Force Energy project in Cook Inlet. The National Marine Fisheries Service (NMFS) is responsible for the administration of the Endangered Species Act (ESA) as it applies to certain cetaceans and pinnipeds in Alaska and the Magnuson Stevens Fisheries Conservation and Management Act as it applies to Essential Fish Habitat (EFH).

Marine Mammals

Marine mammals that range throughout the Gulf of Alaska, including Cook Inlet waters, include the Steller sea lion, harbor seal, Dall's and harbor porpoise, and minke, beluga, killer, humpback, fin, blue, and right whale.

Candidate Species

The Cook Inlet population of beluga whale is currently listed as a candidate species under the ESA.

Endangered Species

Endangered marine mammal species are as follows: fin, right, humpback, blue, sperm, sei, and bowhead whales and the western stock of the northern Steller sea lion (west of 144 degrees longitude). Humpback and fin whales are occasionally sighted offshore during summer months, and have been documented within one-mile of shore. Also, few (and rare) sightings of fin, blue, and right whales in the northern Gulf of Alaska have been reported. Steller sea lions may forage and transit waters of Cook Inlet during peak salmon returns. The closest listed Steller sea lion rookery is in the Barren Islands, specifically the Sugarloaf Islands Rookery at 58 53.0 N, 152 02.0 W. The closest major Steller sea loin haulout is the Ushagat Island Haulout at 58 55.0 N,152 22.0 W.

Essential Fish Habitat

Additionally, NMFS is responsible for provisions regarding Essential Fish Habitat (EFH) within the administration of the Magnuson Stevens Fishery *Conservation and Management Act* (MSFCMA) (16 U.S.C. 1801 et seq.). The MSFCMA states that each federal agency shall consult with NMFS with respect to any federal action authorized, funded, undertaken, or proposed by such agency that may adversely affect EFH. Therefore, your review should also include an EFH assessment as required by the MSFCMA and detailed in 50 CFR Part 600.920 (g). Please visit our website for specific information such as EFH species habitat associations, EFH species maps, and the EFH Environmental Assessment at http://www.fakr.noaa.gov/habitat.

Please call Matthew P. Eagleton in the NMFS Anchorage field office at (907) 271-6354 for any questions.