Environmental Assessment
FOR
The Issuance of a National Marine Fisheries Service Scientific Research Permit and a Permit Amendment for Vessel and Aerial Surveys of Beluga Whales in Cook Inlet, Alaska

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Lead Agency:	USDC National Oceanic and Atmospheric Administration National Marine Fisheries Service, Office of Protected Resources
Responsible Official:	James H. Lecky, Director, Office of Protected Resources
For Further Information Contact:	Office of Protected Resources National Marine Fisheries Service 1315 East West Highway Silver Spring, MD 20910 (301) 713-2289
Location:	Cook Inlet, Alaska

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a scientific research permit and a permit amendment for takes of marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.) and the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Permit No. 14210 would be valid for five years from the date of issuance and would authorize LGL Alaska Research Associates to closely approach up to 375 beluga whales (*Delphinapterus leucas*) by vessel in Cook Inlet, Alaska annually for photo-identification. The purposes of the research are to identify individual whales and to provide information about movement patterns, habitat use, survivorship, reproduction, and population size. The amendment to Permit No. 782-1719-07 would authorize NMFS National Marine Mammal Laboratory to conduct aerial surveys of the entire population of beluga whales in Cook Inlet, Alaska in 2009. The purposes of the surveys are to 1) provide distribution information during June and July; 2) compare distribution changes over time; 3) provide group size estimates for calculations of stock size; 4) estimate fractions of calves and juveniles in the population; and 5) calibrate and improve survey methodology. The amendment would be valid until the permit expires.

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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

The National Marine Fisheries Service (NMFS) proposes to issue a scientific research permit to LGL Alaska Research Associates (LGL; File No.14210) and a permit amendment to NMFS National Marine Mammal Laboratory, (NMML; File No. 782-1719). These would authorize "takes"[1] by "level B harassment"[2] of marine mammals in the wild pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq*.), the regulations governing the taking and importing of marine mammals (50 CFR Part 216), the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.), and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR Parts 222-226). The primary focus of the proposed activities involves the directed taking, for scientific research purposes, of the recently ESA-listed distinct population segment (DPS) of beluga whales (*Delphinapterus leucas*) in Cook Inlet, Alaska.

1.1.1 Purpose and Need

The primary purpose of the permit and permit amendment is to provide an exemption from the take prohibitions under the MMPA and ESA to allow "takes" by "level B harassment" of marine mammals, including endangered species, for *bona fide*[3] scientific research. The need for issuance of the permit and amendment is related to NMFS' mandates under the MMPA and ESA. Specifically, NMFS has a responsibility to implement both the MMPA and the ESA to protect, conserve, and recover marine mammals and threatened and endangered species under its jurisdiction. The MMPA and ESA prohibit takes of marine mammals and threatened and endangered species, respectively, with only a few very specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require that research activities are consistent with the purposes and polices of these federal laws and will not have a significant adverse impact on the species or stock.

1.1.2 Need for Proposed Research and Research Objectives

A Final Rule was published in the *Federal Register* on October 22, 2008 listing the Cook Inlet DPS of beluga whales as endangered under the ESA (73 FR 62919). Prior to this listing, the applicants' Cook Inlet beluga research was authorized under the MMPA by Letter of Confirmation (LOC) No. 481-1795-01 for LGL and by Permit No. 782-1719-07 for NMML.

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[1] Under the MMPA, "take" is defined as to "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." [16 U.S.C. 1362(18)(A)] The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The term "harm" is further defined by regulations (50 CFR §222.102) as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering."

[2] "Harass" is defined by regulation (50 CFR §216.3) as "Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment)."

[3] The MMPA defines bona fide research as "scientific research on marine mammals, the results of which – (A) likely would be accepted for publication in a refereed scientific journal; (B) are likely to contribute to the basic knowledge of marine mammal biology or ecology; or (C) are likely to identify, evaluate, or resolve conservation problems."

This species' ESA status, effective December 22, 2008, prompted the necessity for a scientific research permit for LGL and a permit amendment for NMML under the ESA.

Scientific research is an important means of gathering valuable information about endangered and threatened marine mammals and is necessary to conserve them and promote their recovery. Research conducted by both applicants will address objectives specified in the Conservation Plan for the Cook Inlet Beluga Whale (NMFS 2008a).

NMFS is proposing to issue a new scientific research permit to LGL Alaska Research Associates (LGL) to conduct vessel-based photo-identification research to supplement the identification catalog of distinctively marked Cook Inlet beluga whales. These surveys would continue research ongoing since 2005, and would provide information used to:

- develop abundance estimates
- describe population characteristics
- determine life history characteristics.

This information could then be used in developing a species recovery plan and in the designation of critical habitat. Over the long-term, this data will help NMFS determine if the population is recovering, declining, or stable.

NMFS proposes to amend NMML's permit to authorize takes of Cook Inlet beluga whales, pursuant to the ESA, during aerial surveys which would continue population monitoring ongoing since 1993. These surveys would provide annual information on the distribution of Cook Inlet belugas during June and July, the optimal survey period, and would provide data for:

- comparing distributional changes over time
- group size estimates to calculate stock size
- estimating fractions of calves and juveniles in the population
- calibrating and improving survey methodology.

1.2 OTHER EA/EIS THAT INFLUENCE SCOPE OF THIS EA

NMML's permit (File No. 782-1719), issued in June 2004, has been amended seven times. The environmental assessments conducted through the permit's history evaluated research on all species of cetaceans under NMFS jurisdiction for stock assessment activities throughout U.S. territorial waters and the high seas of the North Pacific Ocean, Southern Ocean, Arctic Ocean, and the territorial waters of Mexico (Gulf of California only), Canada, Russia, Japan, and the Philippines. The permit authorizes close approach during Level B harassment (aerial surveys, vessel-based surveys, observations, and photo-identification) and Level A harassment (biopsy sampling and attachment of scientific instruments) for all age and sex classes.

Under the MMPA, the permit authorized takes for aerial surveys, vessel surveys, photo-identification, and captures for biopsy sampling and tagging of Cook Inlet beluga whales, which must now be re-evaluated because of the ESA-listing. Since NMML and LGL are both requesting to conduct research on Cook Inlet belugas over the next one-year and five-year period, respectively, NMFS determined it was appropriate to batch their permit actions into one EA for analysis, rather than separately supplementing the previous analyses of NMML's permit and completing a new EA for LGL.

1.3 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. CEQ regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) do not require that a draft EA be made available for public comment as part of the scoping process.

The MMPA and its implementing regulations governing issuance of special exception permits for scientific research (50 C.F.R. §216.33) require that, upon receipt of a valid and complete application for a new permit, NMFS publish a notice of receipt in the *Federal Register*. The notice summarizes the purpose of the requested permit and invites interested parties to submit written comments concerning the application. The applications were made available for public review and comment for 30 days (74 FR 6578; 2/10/2009) and provided to the Marine Mammal Commission.

NMFS did not receive any substantive public comments. However, one expert reviewer expressed concern that the number of takes requested by LGL would not be adequate to conduct vessel-based photo-identification as described in the application. The reviewer recommended increasing the number of authorized takes to reflect the entire population of Cook Inlet belugas. NMFS determined that this is reasonable, and increased the proposed take for Permit No. 14210 accordingly. No other comments were received that changed the scope of the proposed action.

1.4 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action, as well as who is responsible for obtaining them. Even when it is the applicant's responsibility to obtain such permissions, NMFS is obligated under NEPA to ascertain whether the applicant is seeking other federal, state, or local approvals for their action.

1.4.1 National Environmental Policy Act

NEPA was enacted in 1969 and is applicable to all "major" federal actions significantly affecting the quality of the human environment. A major federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a federal agency. NMFS' issuance of permits for research represents approval and regulation of activities. While NEPA does not dictate substantive requirements for permits, licenses, etc., it requires consideration of environmental issues in federal agency planning and decision making. The procedural provisions outlining federal agency responsibilities under NEPA are provided in the Council on Environmental Quality's (CEQ) implementing regulations (40 CFR Parts 1500-1508).

NMFS has, through NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by the CEQ. NAO 216-6 specifies that issuance of scientific research permits under the MMPA and ESA is among a category of actions that are generally exempted (categorically excluded) from further

environmental review, except under extraordinary circumstances. When a proposed action that would otherwise be categorically excluded is the subject of public controversy based on potential environmental consequences, has uncertain environmental impacts or unknown risks, establishes a precedent or decision in principle about future proposals, may result in cumulatively significant impacts, or may have an adverse effect upon endangered or threatened species or their habitats, preparation of an EA or EIS is required.

While issuance of scientific research permits is typically subject to a categorical exclusion, as described in NAO 216-6, NMFS is preparing an EA for this action to provide a more detailed analysis of effects to ESA-listed species. This EA is prepared in accordance with NEPA, its implementing regulations, and NOAA 216-6.

1.4.2 Endangered Species Act

Section 9 of the ESA, as amended, and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption such as by a permit. Permits to take ESA-listed species for scientific purposes, or for the purpose of enhancing the propagation or survival of the species, may be granted pursuant to Section 10(a)(1)(A) of the ESA.

NMFS has promulgated regulations to implement the permit provisions of the ESA (50 CFR Part 222) and has produced OMB-approved application instructions that prescribe the procedures necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the ESA.

Section 10(d) of the ESA stipulates that, for NMFS to issue permits under section 10(a)(1)(A) of the ESA, the Agency must find that the permit: was applied for in good faith; if granted and exercised will not operate to the disadvantage of the species; and will be consistent with the purposes and policy set forth in Section 2 of the ESA.

Section 2 of the ESA sets forth the purposes and policy of the Act. The purposes of the ESA are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in section 2(a) of the ESA. It is the policy of the ESA that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA. In consideration of the ESA's definition of conserve, which indicates an ultimate goal of bringing a species to the point where listing under the ESA is no longer necessary for its continued existence (i.e., the species is recovered), exemption permits issued pursuant to section 10 of the ESA are for activities that are likely to further the conservation of the affected species.

Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the U.S. Fish and Wildlife Service) for federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS issuance of a permit affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these Section 7 consultation requirements. Section 7 requires federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of

endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 CFR Part 402).

1.4.3 Marine Mammal Protection Act

The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Permits for bona fide scientific research on marine mammals, or to enhance the survival or recovery of a species or stock, issued pursuant to section 104 of the MMPA are one such exception. These permits must specify the number and species of animals that can be taken, and designate the manner (method, dates, locations, etc.) in which the takes may occur. This section of the MMPA also allows bona fide scientific research that would result only in taking by level B harassment of marine mammals under a General Authorization (GA). NMFS has sole jurisdiction for issuance of such permits and authorizations for all species of cetacean, and for all pinnipeds except walrus[4].

NMFS may issue a permit or authorization pursuant to section 104 of the MMPA to an applicant who submits with their application information indicating that the taking is required to further a bona fide scientific purpose. An applicant must demonstrate to NMFS that the taking will be consistent with the purposes of the MMPA and applicable regulations. If lethal taking of a marine mammal is requested, the applicant must demonstrate that a non-lethal method of conducting research is not feasible. NMFS must find that the manner of taking is "humane"[5] as defined in the MMPA. In the case of proposed lethal taking of a marine mammal from a stock listed as "depleted" NMFS must also determine that the results of the research will directly benefit the species or stock, or otherwise fulfill a critically important research need.

NMFS has promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and has produced OMB-approved application instructions that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. Letters of Intent to conduct research under the GA must be submitted according to regulations at 50 CFR §216.45.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated objective, as well as alternatives eliminated from detailed study. This chapter also summarizes the expected outputs and any related mitigation of each alternative. One alternative is the "No Action" alternative where the proposed permit would not be issued. The No Action alternative is the baseline for the rest of the analyses. The Proposed Action alternative represents the research proposed in the submitted applications for a permit and a permit amendment, with standard permit terms and conditions specified by NMFS.

[4] The U.S. Fish and Wildlife Service has jurisdiction for walrus, polar bears, sea otters, and manatees.

[5] The MMPA defines humane in the context of the taking of a marine mammal, as "that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved."

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action Alternative, neither the proposed permit to LGL nor the permit amendment to NMML would be issued. As of December 22, 2008, the date the ESA-listing of the Cook Inlet beluga whale went into effect, all existing LOCs under the GA for Cook Inlet beluga whales became invalid without an accompanying ESA permit, and research that would result in taking of beluga whales from the Cook Inlet DPS under existing MMPA scientific research permits was prohibited. Therefore, the No Action Alternative would eliminate the potential risks to Cook Inlet beluga whales posed by research activities.

2.2 ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE OF PERMIT AND PERMIT AMENDMENT WITH STANDARD CONDITIONS)

Under the proposed action, the scientific research permit and permit amendment would be issued to allow takes of endangered Cook Inlet beluga whales for scientific research purposes under the ESA and MMPA (50 CFR Parts 216 and 222-226). The proposed permit and permit amendment would be issued as described in the submitted permit and permit amendment applications and as conditioned in the resulting permit and permit amendment.

LGL - Vessel surveys

NMFS proposes to authorize up to 375 annual takes to LGL to closely approach belugas in Cook Inlet by vessel for photo-identification. If authorized, the permit would be valid for five years.

Dedicated surveys of Upper Cook Inlet would be conducted from small vessels in the Susitna River Delta, Knik Arm, around the Port of Anchorage, and Chickaloon Bay/Southeast Fire Island. Boat-based surveys of the lower Inlet, including around Kalgin Island, might also occur (Figure 1). Up to 30 surveys per year would be conducted during the 25 ice-free weeks between mid-May and October annually. All boat launch and retrieval would occur at the Port of Anchorage Small Boat Launch.

Vessel-based surveys would cover a pre-determined route of a given area, determined by tidal stage, water depth, and navigational hazards. The survey vessel would be a Zodiac ProMan9, 4.9-m rigid-hull inflatable with a 4-stroke 50 hp Yamaha motor. The vessel would carry one skipper and one crew, both of whom would also photograph the whales and record data.

Whale groups would be approached at no-wake speed (< 4 knots) then followed slowly, parallel to the group, matching the speed and heading of the group in order to obtain lateral images of all individual whales while minimizing disruption to the group. When possible, the survey vessel would be maneuvered to parallel a traveling group towards the leading edge and then slowed to idle, allowing the majority of the group to pass by the boat. Often the boat would first approach the group at a 45 degree angle, and then close the angle during approach until the boat is parallel to the group, with a distance of greater than 50 meters between the vessel and the whales. Researchers would occasionally approach belugas to a distance of less than 50 meters to obtain quality identification photographs. If whales approach within *ca.* 2 m of the boat, the engine would be put into neutral and/or turned off to minimize effects to the whales, as described in the permit application.

Data collected during encounters would include estimated minimum group size, minimum number of whales present by color-class, number of calves and newborns, group behavior, and digital photographs for individual whale identification. Attempts would be made to obtain photographs of the right and left sides of whales. Positions of whale groups and survey track lines would be recorded using a GPS. Digital photographs of beluga whales would be collected using a Nikon D70, 6.1 megapixel digital SLR camera, with zoom telephoto auto focus lenses. Once all individuals in the group have been photographed or observers determine that they are unable to photograph all whales in a group, the survey boat would leave the group and continue the survey. Whale groups would not be "tracked" (i.e., followed over time) once photographs have been collected. Whale groups would only be approached once per survey day, unless a group is initially difficult to photograph, abandoned by the survey vessel within five minutes, and encountered again later in the day.

Mitigation Measures - LGL: General conditions would be included in Permit No. 14210 to minimize disturbance to target animals. These include, from section B of the proposed permit:

Counting and Reporting Takes

6. Any "approach"[6] of a cetacean constitutes a take by harassment and must be counted and reported.

7. No individual animal may be taken more than 3 times in one day.

General

8. To minimize disturbance of the subject animals the Permit Holder must exercise caution when approaching animals and must retreat from animals if behaviors indicate the approach may be interfering with reproduction, feeding, or other vital functions.

9. Where females with calves are authorized to be taken, Researchers:

    a. Must immediately terminate efforts if there is any evidence that the activity may be interfering with pair-bonding or other vital functions;

    b. Must not position the research vessel between the mother and calf;

    c. Must approach mothers and calves gradually to minimize or avoid any startle response; and

    d. Must not approach any mother or calf while the calf is actively nursing.

[6] An "approach" is defined as a continuous sequence of maneuvers (episode) involving a vessel, including drifting, directed toward a cetacean or group of cetaceans closer than 100 yards for large whales, or 50 yards for smaller cetaceans.

The permit would also require that LGL coordinate with other researchers in the area, specifically NMML, to minimize harassment to Cook Inlet belugas.

NMML - Aerial surveys

NMFS is proposing to authorize an amendment to NMML's current permit to allow the conduct of aerial surveys of the entire population of belugas in Cook Inlet up to 20 times annually. The requested permit amendment would be effective from issuance through June 30, 2009. NMFS has also received and is considering a separate request for a one-year permit extension from NMML. The issuance of a one-year extension, if granted, would also extend this amendment through June 30, 2010. This potential extension would not issue any new takes, it would allow the takes authorized for the final year of the permit to be used through June 30, 2010 instead of expiring on June 30, 2009. While the granting of a one-year extension of NMML's permit was analyzed in a Supplemental EA (SEA) (NMFS 2008d) and found not to be significant in the FONSI issued (April 15, 2008), that SEA did not consider the taking of Cook Inlet belugas as a listed species. Since this EA evaluates annual takes as requested in NMML's amendment application, also it inherently analyzes whether there would be any change in the nature of those effects should a one-year permit extension be granted.

Aerial surveys would generally be flown at an altitude of 800 ft at approximately 100 knots (185 km/hr). Up to 20 surveys would be conducted annually over a period of approximately two weeks each summer, generally in June. Multiple passes would be made until observers have at least four good counts, maximizing accuracy. This typically requires 4-8 passes over or near a whale group, but may occasionally require up to 16 passes. The flight pattern used to count a group involves an extended oval around the longitudinal axis of the group with turns made well beyond the belugas. On some surveys, high-resolution video or still photography would be used to determine the calving success of the population, requiring up to four additional passes over each group of whales. Overall encounter times vary based on many factors including group size and sighting conditions, and can range from 10 minutes for a small group to two hours with a very large group. An Aero Commander 680 or NOAA twin otter, with twin-engines, high-wings, and more than 6-hour flying capability would be used for surveys.

Coastal surveys would be conducted approximately 1.4 km offshore to search all nearshore, shallow waters where belugas are typically seen in late spring/early summer. This includes searches up rivers until the water appears to be too shallow for belugas. In addition to the coastal surveys, systematic transects would be flown across the Inlet. Offshore tracklines would run the length of Cook Inlet or cross it, minimizing overlap with the 2008 survey effort and between previous survey years.

The flight schedule would take advantage of tidal patterns relative to workable daylight hours, and specific areas would be surveyed when belugas are easiest to locate and count. Researchers would attempt to synchronize flights with low tides in the Susitna delta because large areas of mudflats are exposed at low tide. Tide changes in Turnagain Arm can be so rapid that tide rips with white caps compromise visibility, so attempts would be made to survey this area at slack tide. In Chickaloon Bay, belugas tend to be close to shore or in Chickaloon River at high tide. Aerial surveys south of East and West Foreland would be scheduled based on weather.

If other marine mammal species are observed during aerial surveys, aircraft would only circle long enough to determine species before continuing on the trackline.

NMML's Permit No. 782-1719-07 authorized takes to capture Cook Inlet beluga whales for genetic sampling and tagging purposes. These activities have been discontinued and will not be authorized in the proposed amended permit.

Mitigation Measures - NMML: All current mitigation measures within Permit No. 782-1719-07 would remain in effect except as noted here. Permit conditions would clarify that only aerial surveys at 800 feet or higher would be authorized for Cook Inlet belugas. The following condition (B.2.d.2) regarding beluga captures would be removed from the permit because it would no longer apply to the permitted research:

> In Cook Inlet whales must be released:
>
> (A) if after 10 minutes the encircled whale has not become entangled in the net;
>
> (B) if within 30 minutes of encirclement the whale is not secured in the sling or in shallows for tagging; and
>
> (C) regardless of the sampling protocol, the whale is secured up to 60 minutes. An animal will not be handled more than 60 minutes, with no more than 30 minutes partially immobilized.

The condition would be replaced with:

> In Cook Inlet **beluga** whales **must not be captured**.

The permit would also require that NMML coordinate with other researchers in the area, specifically LGL, to minimize harassment to Cook Inlet belugas.

Description of take numbers:

LGL: It is possible that the entire population of Cook Inlet belugas, estimated at 375 animals in 2008 (95% CI = 240-585; Hobbs and Shelden 2008), could be seen during up to 30 vessel surveys conducted annually by LGL. While LGL does not intend to approach belugas within 50 meters, Level B harassment leading to behavioral changes may occur outside of 50 meters. Based on information from LGL's 2008 annual report (McGuire 2008), there were three instances in 2008 where beluga groups were difficult to approach and photograph, noted at the initial observation of the group. While this may have been due to level B harassment, it also may have been related to natural behaviors by the beluga groups. If each individual on these three occasions were conservatively counted as taken, 91 takes would have occurred just from these three groups.

NMML: It is also possible that the entire population of Cook Inlet belugas could be taken on each of up to 20 aerial surveys conducted annually by NMML. During aerial surveys, any animal that is observed while at an altitude of less than 1000 feet is considered to have been

taken. NMML proposes aerial surveys at an altitude of 800 feet, so all belugas seen would be considered takes as defined under the ESA regardless of whether behavioral changes are observed.

Taking these conservative scenarios into account, and acknowledging that the population may increase during the authorized time period, NMFS PR1 proposes to authorize LGL takes for 375 Cook Inlet belugas (Table 1). In their application, NMML used the high end of the confidence interval to determine requested take numbers, so NMFS PR1 is proposing to authorize 20 takes per each of 585 individuals in their amended permit (Table 1).

Table 1. Proposed Annual Takes in Cook Inlet, Alaska.

Applicant	Species	Life Stage	Sex	Expected Take	Number of Takes per Individual	Take Action	Time Period
LGL	Beluga whale, Cook Inlet DPS (*Delphinapterus leucas*)	All ages	Males and Females	375	1	Close approach*, photo-id	May 15-October 31
NMML	Beluga whale, Cook Inlet DPS (*Delphinapterus leucas*)	All ages	Males and Females	585	20	Aerial surveys	Year-round

* For purposes of this permit, an "approach" is described as a continuous sequence of maneuvers by a vessel, including drifting, that involves one or more intentional instances of coming closer than 50 yards to a whale or group of whales for the purpose of conducting authorized research.

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives, as well as environmental components that would affect the alternatives if they were to be implemented. The effects of the alternatives on the environment are discussed in Chapter 4.

3.1 SOCIAL AND ECONOMIC ENVIRONMENT

Economic and social factors are listed in the definition of effects in the NEPA regulations. However, the definition of human environment states that "economic and social effects are not intended by themselves to require preparation of an EIS." An EA must include a discussion of a proposed action's economic and social effects when these effects are related to effects on the natural or physical environment. The social and economic effects of the Proposed Action mainly involve the effects on the people involved in the research, as well as any industries that support the research, such as charter vessels, and suppliers of equipment needed to accomplish the research. There are no significant social or economic impacts of the Proposed Action interrelated with significant natural or physical environmental effects. Thus, the EA does not include any further analysis of social or economic effects of the proposed action.

3.2 PHYSICAL ENVIRONMENT

The action area is specific to Cook Inlet, a semi-enclosed tidal estuary that flows into the Gulf of Alaska. The inlet is approximately 370 km in length, roughly 20,000 sq km, and has 1,350 km of coastline. It has a northeast/southwest orientation that is generally divided into upper and lower regions by the East and West Forelands, land outcrops located just north of the city of Kenai. Prominent features of Upper Cook Inlet include Knik Arm and Turnagain Arm that enter Cook Inlet at the northeast end, the Susitna River Delta at the northern end, and a number of rivers and small streams entering the northwestern side amid mixed topography (Figure 1). The Inlet has extreme tidal fluctuations, with a mean diurnal tidal range of 8.8 m (29 ft). Currents at mid-inlet may reach or exceed 2.4 m/sec (8 ft/sec). A thorough description of Cook Inlet can be found in Chapter 3 of the Cook Inlet Beluga Whale Subsistence Harvest Final Supplemental EIS (NMFS 2008b).

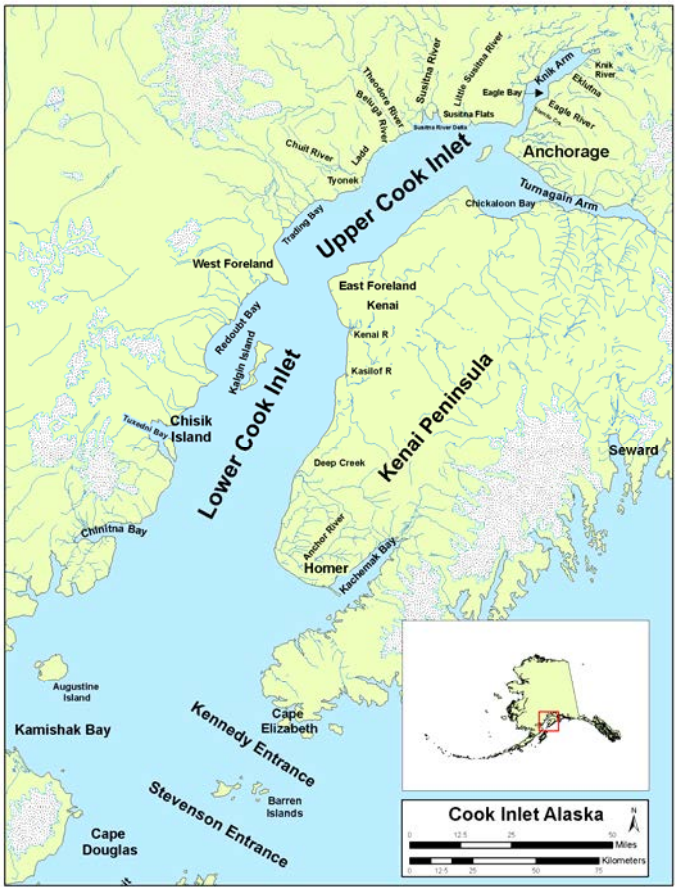

Figure 1. Map of Cook Inlet, Alaska.

3.2.1 Sanctuaries, Parks, Historic Sites, etc.

The Alaska State Legislature has classified certain areas as being essential to the protection of fish and wildlife habitat, but these Critical Habitat areas are not specific to any one species. There are a variety of refuges and critical habitat areas in Cook Inlet, including:

In upper Cook Inlet

- Goose Bay State Game Refuge
- Anchorage Coastal Wildlife Refuge
- Susitna Flats State Game Refuge

In lower Cook Inlet

- Kalgin Island Critical Habitat Area
- Redoubt Bay Critical Habitat Area
- Fox River Flats Critical Habitat Area
- Kachemak Bay Critical Habitat Area
- Homer Airport Critical Habitat Area
- McNeil River State Game Sanctuary and Refuge

At times LGL's survey route might approach the Anchorage Coastal Wildlife Refuge and the Susitna Flats State Game Refuge, but they would not enter the refuges. LGL's activities would not be expected to impact the physical environment because they would not anchor vessels or buoys, beach the vessel along mudflats, or collect fish. All boat launch and retrieval would occur at the Port of Anchorage Small Boat Launch. While NMML's proposed aerial surveys might fly over these areas, they would not be expected to affect the physical environment.

3.2.2 Essential Fish Habitat (EFH)

EFH has been designated for several species of groundfish and salmon within the action area. Details of the designations and descriptions of the habitats are available in the Pacific Fishery Management Plans. Activities that have been shown to affect EFH include disturbance or destruction of habitat from stationary fishing gear, dredging and filling, agricultural and urban runoff, direct discharge, and the introduction of exotic species. None of the activities in the Proposed Action are directed at or likely to have any impact on any designated EFH, therefore EFH is not considered further in this document.

3.2.3 Designated Critical Habitat

No Critical Habitat has been federally designated in the action area.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Target species

Cook Inlet beluga whales: Cook Inlet beluga whales are listed as endangered under the ESA and depleted under the MMPA. This DPS remains in the Inlet year-round, concentrating at rivers and bays in the upper Inlet during summer and fall, and dispersing offshore into the mid

Inlet during winter (Hobbs et al. 2005). Their movement patterns exploit seasonal changes in prey distribution (i.e., they follow their prey) (NMFS 2008a). They feed on a variety of seasonally-abundant prey, such as eulachon (*Thaleichthys pacificus*) and Saffron and Pacific cod (*Eleginus graciliis* and *Gadus macrocephalus*) in spring, several species of salmon (*Oncorhynchus* spp.) during summer, and bottom-dwellers such as Pacific staghorn sculpin (*Leptocottus armatus*) and flatfishes [e.g. starry flounder (*Platichthys stellatus*) and yellowfin sole (*Limanda aspera*)] in the fall (described in detail in Hobbs et al. 2006; NMFS 2008a).

Aerial surveys conducted in 1978-79 indicate that belugas were previously distributed over a relatively large area of Cook Inlet, but the highest concentration of belugas has since shifted northeast towards the Little Susitna River, Knick Arm, and Turnagain Arm (Hobbs and Shelden 2008). Satellite tagging and aerial abundance surveys indicate that Knick Arm, Turnagain Arm, Chickaloon Bay, and the Susitna River delta are high-use areas of the upper Inlet for belugas.

While there are no reliable historic abundance estimates, systematic, annual aerial surveys have been conducted by NMFS since 1993, and have documented a decline in abundance from an estimated 653 animals in 1994 to an estimated 375 animals in 2008 (Hobbs and Shelden 2008). It is possible that as the population declined the remaining animals retracted to preferred habitat, or that the remaining population is limited to optimal habitat where feeding opportunities are maximized by prey concentration in shallow river channels (Hobbs and Shelden 2008).

Cook Inlet belugas were subject to commercial whaling and sport hunting prior to the MMPA, and Alaska Natives have legally hunted them prior to and since the passage of the MMPA. Although it is difficult to obtain accurate estimates of harvest numbers by Alaska Natives, it is believed that at least 30 belugas were taken annually during the mid- to late-1990s (detailed in Mahoney and Shelden 2000). The Cook Inlet beluga population also declined during this period, from an estimated 653 in 1994 to an estimated 367 in 1999 (Hobbs et al. 2000). In 1999, concerns about this decline and continued exploitation led to the Native community voluntarily suspending the subsistence hunt. A limited number of belugas have since been taken annually.

Long-term limits on the maximum number of Cook Inlet belugas that may be taken by Alaska Natives for subsistence and handicraft purposes were established in 2008 and effective on November 14, 2008 (Final Rule, 73 FR 60976, October 15, 2008). In accordance with the *Subsistence Harvest Management Plan*, there will be no harvest from 2008-2012 because the most recent 5-year population average was less than 350 belugas (the 2003-2007 average was 336 belugas). A harvest will only be allowed from 2013-2017 if the 5-year population average from 2008-2012 is greater than 350 belugas. Harvest numbers are determined using a combination of that average and the best estimate of the population growth rate using data from the previous 10 years, as detailed in the final rule.

For more information, a detailed description of the biology and life history of Cook Inlet belugas can be found in section 3.2.1 of the Cook Inlet Beluga Whale Subsistence Harvest Final Supplemental EIS (NMFS 2008b).

3.3.2 Non-target species

In addition to the species that are the subject of the proposed action (target species), a wide variety of non-target species could be found within the action area, including other marine mammals, invertebrates, fish, and sea birds. Since merely being present within the action area does not necessarily mean a marine organism will be affected by the proposed action, the following discussion focuses not only on the distribution and abundance of various species with respect to the timing of the action, but also on whether and by what means the proposed research activities may affect the non-target species.

Endangered and Threatened Species under Fish and Wildlife Service Jurisdiction

Northern sea otters, southwest Alaska DPS (*Enhydra lutris kenyoni*; Threatened) and Steller's eiders (*Polysticta stelleri*; Threatened) are present in lower Cook Inlet, within the action area of NMML's aerial surveys. NMFS consulted with FWS, who concurred that aerial surveys conducted at 800 feet are not likely to adversely affect either species. As such, they are not considered further in this document.

Invertebrates, Fish, and Sea Birds

A variety of fish and sea birds may be present within the action area; however, none would be targeted during the proposed research. The distribution of Cook Inlet belugas throughout the year is dependent on prey species such as salmon and eulachon, found seasonally throughout Cook Inlet, and Pacific cod, Pacific staghorn sculpin, saffron cod, yellowfin sole, and starry flounder, found in upper Cook Inlet.

Vessel surveys conducted by LGL would not impact fish, sea birds, or the physical environment because they would not be anchoring vessels or buoys, beaching the vessel along mudflats, or collecting fish. The presence of the vessel would cause no greater effects than that of any other vessel in the area. NMML's aerial surveys would not affect fish, and would cause no greater effects to sea birds than that of any other plane in the area.

Detailed descriptions of fish and sea bird species in Cook Inlet can be found in sections 3.3 and 3.4.2, respectively, of the Cook Inlet Beluga Whale Subsistence Harvest Final Supplemental EIS (NMFS 2008b).

Marine mammals

Fifteen non-endangered marine mammal species are residents of or found seasonally in Cook Inlet, but only harbor seals (*Phoca vitulina*) are commonly observed in upper Cook Inlet. Killer whales (*Orcinus orca*) and harbor porpoise (*Phocoena phocoena*) are only occasionally observed in upper Cook Inlet. While these species might be in the vicinity of vessel surveys conducted by LGL, the presence of the vessel would cause no greater effects to them than that of any other vessel in the area. These species might also be sighted during aerial surveys conducted by NMML, but would only be circled long enough to determine species.

The range and seasonal distribution of endangered fin (*Balaenoptera physalus*), sei (*B. borealis*), and humpback (*Megaptera novaeangliae*) whales include lower Cook Inlet, but they are uncommon in upper Cook Inlet. The endangered western population of Steller sea lions (*Eumetopias jubatus*) is found in Cook Inlet, but is primarily observed in lower Cook Inlet, and no haulouts or rookeries exist in the action area. It is unlikely that these species would be in the

vicinity of vessel surveys. They might be sighted during aerial surveys conducted by NMML, but would only be circled long enough to determine species.

Since the proposed action is specific to the target species, research activities would not be expected to adversely affect other marine mammal species or other portions of the environment. No netting or in-water activities, other than operation of LGL's research vessel, would occur under the proposed action. The presence of the vessel would cause no greater effects than that of any other vessel in the area. Non-target marine mammals may be sighted during aerial surveys conducted by NMML, but would only be circled long enough to determine species. NMFS recognizes the possibility that non-target species could occur in the study area, however, the researchers would not intentionally approach any species other than Cook Inlet beluga whales.

A detailed description of marine mammals found in Cook Inlet can be found in section 3.3.4 of the Cook Inlet Beluga Whale Subsistence Harvest Final Supplemental EIS (NMFS 2008b).

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 EFFECTS OF ALTERNATIVE 1: No Action

Not issuing the proposed permit and permit amendment would eliminate any potential risk to the social, economic, physical, and biological environment from the proposed research activities. No research is currently authorized on Cook Inlet beluga whales, and denial of the permit and permit amendment would create no potential risk of harassment to this DPS of belugas or any other wildlife in the affected environment because the research would not be conducted. However, by not allowing the research to be conducted the opportunity would be lost to collect information that would contribute to better understanding Cook Inlet beluga whales and provide information to NMFS that is needed to implement NMFS management activities.

Under the No Action Alternative, NMFS would not have access to information on the species' population size and distributions, and would not be able to implement conservation measures to conserve and recover the Cook Inlet beluga whale.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit and permit amendment with standard conditions

Impacts of the proposed action would be limited primarily to the biological and physical environment, specifically to the target species and to non-target marine mammals in the vicinity of the research activities. The type of action proposed in the permit and permit amendment requests would be unlikely to affect the socioeconomic environment or pose a risk to public health and safety.

For all activities, the most likely impact would be the Level B harassment of individual whales. Such harassment would be minimal and temporary with animals resuming their previous behaviors within minutes. No serious injury or mortality would result from these activities, and they are not likely to disrupt the breathing, nursing, feeding, breeding, or sheltering behavior of beluga whales. The disturbance from these activities is not likely to have a significant effect on the Cook Inlet DPS of beluga whale.

Vessel surveys

The presence of vessels can lead to disturbance of marine mammals although the animals' reaction is generally short-term and of a low impact. Several researchers have studied the short-term responses of cetaceans to disturbance caused by vessel approaches (Killer whale: Williams, 1999; Williams *et al.*, 2002a; 2002b. Humpback whale: Hall, 1982; Baker *et al.*, 1983; Bauer and Herman, 1986. Sperm whale: Magalhães *et al.*, 2002; Richter *et al.*, 2006).

Williams (1999) and Williams *et al.* (2002a) noted that killer whales responded to experimental vessel approaches by adopting a less predictable path than observed during the preceding, no-boat period. Female killer whales responded by swimming faster and increasing the angle between successive dives, whereas males maintained their speed and chose a smooth, but less direct, path. Baker *et al.* (1983) described two responses of humpback whales to vessels: (1) "horizontal avoidance" of vessels 2,000 to 4,000 meters away characterized by faster swimming and fewer long dives; and (2) "vertical avoidance" of vessels from 0 to 2,000 meters away during which whales swam more slowly, but spent more time submerged. Watkins *et al.* (1981) found that both fin and humpback whales appeared to react to vessel approaches by increasing swim speed, exhibiting a startled reaction, and moving away from the vessel with strong fluke motions. Humpback whales appear to exhibit similar patterns of response to vessels on both their summering grounds (Baker *et al.*, 1983 and Baker and Herman, 1987) and their wintering grounds (Bauer and Herman, 1986). In the Azores, mature females accompanied by calves and immature sperm whales significantly increased their individual mean blow interval in the presence of boats, however, the whales showed no clear pattern of short-term reactions to whale-watching boats (Magalhães *et al.* 2002). Richter *et al.* (2006) reported that sperm whales off Kaikoura, New Zealand, responded to whale-watching activities by changing directions; however, these responses were small and most likely not of biological importance.

In addition, LGL's annual reports from 2007 and 2008 indicate that there were very few perceptible potential short-term responses to the vessel, such as approaching the vessel and bubble blowing, or avoiding the boat. In 2008, three of 29 beluga whale groups were difficult to approach, and in 2007 two of 54 groups exhibited behavioral changes that could have been caused by the vessel. While belugas can hear the motor at low idle, and behavioral changes may occasionally occur during close vessel approaches, in general belugas appear habituated to the vessel's presence. Photographs verify repeated sightings of individuals on multiple days, supporting the expectation that behavioral responses, if they occur, would be short-term.

Close vessel approaches to conduct photo-identification and behavioral observation are expected to result in Level B harassment because they have the potential to disturb the whales, but are not considered to have the potential to result in injury. As described in the proposed action, close approaches would be made in a controlled manner at safe speeds so as not to alarm the whales.

Due to slow vessel speed and constant surveillance for animals in the vicinity NMFS expects the risk of ship strike to be very low.

Methodologies are designed to minimize disturbance to belugas. Data collected by LGL are dependent on the ability to observe belugas, so every effort would be made to prevent causing avoidance behaviors.

Aerial surveys

Reactions of toothed whales to aircraft are reported less often than those of pinnipeds, perhaps indicating that visual and audible stimuli from aircraft are less relevant to marine mammals in the water than to pinnipeds hauled out on land or ice (Richardson et al. 2000). Animals sometimes respond to changes in engine pitch or shadows projected by aircraft by diving rapidly or swimming away. NMFS recognizes that approaches to marine mammals by aircraft below certain altitudes could result in Level B harassment because they have the potential to disturb the whales, but are not considered to have the potential to result in injury. However, proximity of the aircraft does not appear to result in changes in the whales' behavior that would suggest long-term adverse effects on individuals, pods, or populations, such as a decline in numbers or site abandonment.

Whale groups are known to occasionally split or merge, but seemingly not in response to survey aircraft. Whales are often seen swimming in the same direction and speed throughout the aerial circling procedure, without any observed change in activity (Rugh et al. 2000). Aircraft pose no apparent threat to the whales, and evidence suggests that they have habituated to the aerial traffic generated by several major airports around upper Cook Inlet (Rugh et al. 2000).

The proposed aerial surveys would be of short duration and aircraft would circle high (800 ft) above animals. Past NMML surveys have consistently been flown near 244 m (800 feet), and belugas have not exhibited overt avoidance behaviors (Rugh et al. 2000, NMML annual reports 2004-05, 2006-07, and 2007-08). This altitude has been previously shown to be a good compromise between maximum visual range and optimal sighting cue size without resulting in any evident disturbance to the animals (Rugh et al. 2000).

Based on the results from past aerial surveys conducted since 1993, little to no change in Cook Inlet beluga whale behavior is expected. Aerial surveys would primarily occur during a two-week period in June, but up to 20 surveys might be conducted year-round. Harassment from repeated surveys is not expected to be any greater than that from single surveys. Data collected by NMML are dependent on the ability to observe belugas, so methodologies are designed to minimize disturbance to belugas.

Effects to Non-target Species

While other marine mammals may occasionally be found in Cook Inlet, research would be conducted in such a manner that NMFS would not expect non-target species to be significantly affected. The applicants would not be working directly off of any known pinniped rookeries in the action area or make attempts to approach any pinniped species. The presence of the research vessel in the water column or the aircraft flying overhead is expected to be no different to non-target animals than any other routine vessel or aircraft that operates in the action area. NMML's

current permit authorizes take of any cetaceans that could be in the area; multiple pinniped permits held by NMML authorize the take of pinnipeds that could be in the area.

Effects to physical habitat

Since the proposed action would occur within the upper portion of the water column or in the air and routine vessel movements would not contact any substrate, the action would not affect any sediment, hard bottom, structures underlying the waters, or associated biological communities. Therefore, issuance of the permit and permit amendment would have no significant impacts to habitat.

4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

As summarized below, NMFS has determined that the proposed research is consistent with the purposes, policies, and applicable requirements of the MMPA, ESA, and NMFS regulations. NMFS' issuance of the permit and permit amendment would be consistent with the MMPA and ESA. NMFS is not aware of additional permits required by LGL or NMML to conduct the proposed research.

4.3.1 Endangered Species Act

This section summarizes conclusions resulting from consultation as required under section 7 of the ESA. The consultation process was concluded after close of the comment period on the application to ensure that no relevant issues or information were overlooked during the initial scoping process summarized in Chapter 1. For the purpose of the consultation, the draft EA represented NMFS' assessment of the potential biological impacts. A biological opinion was prepared for the proposed action and it concluded that the issuance of Permit No. 14210 and Permit Amendment No. 782-1719-08, and the subsequent conduct of research, is not likely to jeopardize the continued existence of the endangered Cook Inlet DPS of beluga whale (NMFS 2009). The biological opinion also considered the potential for a one-year extension to NMML's amended permit (No. 782-1719-08), allowing the takes authorized for the final year of the permit to be used through June 30, 2010.

4.3.2 Marine Mammal Protection Act

The applicants submitted applications which included responses to all applicable questions in the application instructions. The requested research is consistent with applicable issuance criteria in the MMPA and NMFS implementing regulations. The views and opinions of scientists or other persons or organizations knowledgeable of the marine mammals that are the subject of the application or of other matters germane to the applications were considered, and support NMFS's initial determinations regarding the applications.

The permit and permit amendment would contain standard terms and conditions stipulated in the MMPA and NMFS's regulations. Conditions in NMML's current permit (No. 782-1719-07) would remain in effect except as noted in section 4.5. As required by the MMPA, each permit would specify: (1) the effective date of the permit; (2) the number and kinds (species and stock) of marine mammals that may be taken; (3) the location and manner in which they may be taken; and (4) other terms and conditions deemed appropriate. Other terms and conditions deemed appropriate relate to minimizing potential adverse impacts of specific activities (e.g. capture,

sampling, etc.), coordination among permit holders to reduce unnecessary duplication and harassment, monitoring of impacts of research, and reporting to ensure permit compliance.

4.4 COMPARISON OF ALTERNATIVES

While denial of the proposed permit and permit amendment under the No Action alternative would eliminate the risk of harassment from scientific research on Cook Inlet beluga whales, the proposed scientific research activities are necessary to understand the effects of potential risk factors that have been linked to the decline of the Cook Inlet beluga whale DPS. Results from scientific research are important resources for developing science-based management actions to address the threats to declining cetacean species and their biological and physical environment. Strategy 1 of the Conservation Plan for the Cook Inlet beluga whale (NMFS 2008a) is to "Improve understanding of the biology of the Cook Inlet beluga whale and the factors limiting the population's growth". This includes objectives to (1) assess changes in the Cook Inlet beluga whale population size; (2) improve knowledge of Cook Inlet belugas to determine which factors are limiting recovery; and (3) refine knowledge of Cook Inlet beluga whale habitat requirements and describe their range, distribution, and migration.

Disturbance is the greatest potential threat from the research activities under the Proposed Action alternative. There is little information on the long-term impacts of disturbance on the target marine mammals, however, scientific literature indicates that disturbance such as that caused by limited close approach of vessels and overflights by aircraft can temporarily disrupt vital functions such as feeding, mating, nursing, and resting. At present, there is no indication that research-related disturbance has had a long-term negative impact on the target marine mammals in the proposed action area.

The annual conduct of the proposed research activities would involve close vessel approach by one vessel and aerial surveys by one plane resulting in level B harassment of Cook Inlet beluga whales. While this might result in a very small amount of disturbance as researchers closely approach or circle above the target cetacean species, the duration of sampling would be brief and mitigation measures would be used to ensure that any effects of the research are short lived. A maximum of 30 vessel surveys and 20 aerial surveys would be conducted annually, and would not be expected to have greater effects than the routine vessel and aircraft currently operating in the action area. Additional incidental disturbance of non-target cetacean or pinniped species would be expected to occur if those animals are in the vicinity of research activities. Compared to the No Action alternative, which would maintain the baseline of no scientific research on Cook Inlet beluga whales, this would not represent a substantial increase in the harassment of any marine mammals in the action area.

4.5 MITIGATION MEASURES

In addition to the mitigation measures identified by researchers in their applications all NMFS marine mammal research permits contain conditions intended to minimize the potential adverse effects of the research activities on the animals. These conditions are based on the type of research authorized, the species involved, and information in the literature and from the researchers themselves about the effects of particular research techniques and the responses of animals to these activities.

In addition to these mitigation measures, in signing the permit, the researchers acknowledge that the permit does not relieve them of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations.

Conditions specific to Cook Inlet beluga whales are detailed in Chapter 2, and a complete list of permit conditions are in LGL and NMML's permits.

4.6 UNAVOIDABLE ADVERSE EFFECTS

The mitigation measures imposed by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research on the targeted species as well as any other species that may be incidentally harassed. However, as discussed above, short-lived, minimal disturbance of target and non-target animals may still occur. The most likely effect would be disturbance to some of the target whales caused by the presence of the research vessel or plane. This may temporarily interrupt normal activities such as feeding and resting, but the effect on the animals is not expected to exceed level B harassment, as defined under the MMPA, or to have a significant long-term effect on individuals or the population. In other words, while individual whales may exhibit temporary disturbance or evasive behaviors in response to the activities of researchers, the impact to individual animals is not likely to be significant because the reactions will be short-lived.

4.7 CUMULATIVE EFFECTS

Cumulative effects are defined as those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

4.7.1 Other research permits and authorizations

There are currently no scientific research permits authorizing takes of Cook Inlet belugas. As discussed in section 1.1.2, both LGL and NMML were authorized to conduct the proposed research under the MMPA prior to the ESA listing of this DPS. Prior to the ESA listing, aerial and vessel surveys, including biopsy sampling, of Cook Inlet belugas were also authorized in the Southwest Fisheries Science Center's permit (No. 774-1714-08) and vessel approach for photo-identification was authorized in an LOC held by Michael Williams (No. 1066-1766-01). If both LGL's permit and NMML's permit amendment are issued, repeated disturbance of individual whales is likely to occur in some instances, but this would represent less than was authorized until the ESA listing. NMFS has taken steps to limit repeated harassment through permit conditions requiring coordination among permit holders. NMFS would continue to monitor the effectiveness of these conditions in avoiding unnecessary repeated disturbances. Overall, the proposed action would not be expected to have more than short-term or negligible effects on endangered Cook Inlet beluga whales.

NMFS is aware of one permit authorizing the take of Cook Inlet beluga whales for harassment of marine mammals incidental to the Port of Anchorage Marine Terminal Redevelopment Project. This would include Cook Inlet belugas exposed to noise from construction activities, specifically

pile driving. NMFS has received a request for future authorization of this project for up to five years. NMFS' 2008 EA on this action determined that responses of marine mammals, including beluga whales, to pile driving activities would be behavioral in nature and could likely include altered headings, fast swimming, changes in dive, surfacing, respiration, and feeding patterns, and changes in vocalizations. NMFS does not anticipate that beluga whales would be permanently displaced or undergo any short or long term adverse biologically significant behaviors (NMFS 2008c).

4.7.2 Potential anthropogenic threats

A detailed discussion of potential cumulative threats to Cook Inlet belugas and a threat assessment matrix can be found in the Conservation Plan (NMFS 2008a) and is summarized here.

Alaska Natives have harvested Cook Inlet beluga whales for decades. Harvest levels were high enough to account for the 14 percent annual rate of decline of the population from 1994 to 1998, and have been regulated since 1999. While there will be no subsistence harvest from 2008-2012, legal harvesting may be allowed in the future. The *Subsistence Harvest Management Plan* regulates the annual number of belugas that may be legally harvested, and a Supplemental Environmental Impact Statement (NMFS 2008b) was completed on this action.

The potential for poaching and illegal harassment of Cook Inlet belugas exists, but no poaching incidents have been confirmed.

A variety of personal use, subsistence, and recreational fisheries occur in Cook Inlet. Ship strikes, displacement from important feeding areas, harassment, and prey competition may result, however NMFS has no record of any Cook Inlet belugas injured or killed in these activities.

Several commercial fisheries also occur in Cook Inlet waters, and have varying likelihoods of interacting with belugas via entanglements, injuries, or mortalities that occur incidental to operations. Because belugas tend to concentrate in the upper Inlet in the summer, fisheries in the lower Inlet will likely have little direct impact on Cook Inlet belugas. The current rate of direct mortality from commercial fisheries appears to be insignificant (NMFS 2008a). It is unknown whether competition with commercial fishing operations for prey is having a significant or measurable effect on Cook Inlet belugas.

Pollution in Cook Inlet may come from sources such as wastewater treatment, stormwater runoff, airport deicing, and ballast water discharge, but the potential impacts on Cook Inlet belugas have not been analyzed.

Much of Cook Inlet overlies oil and natural gas reserves, with industry infrastructure that is more than 40 years old and will require repair for continued use. Alaska Department of Natural Resources has held an annual Cook Inlet Areawide Oil and Gas Lease Sale since 1999, and will do so through 2009, offering tracts throughout the State waters of the Inlet. While construction may temporarily result in habitat loss, a natural gas blowout or oil spill in upper Cook Inlet could severely impact belugas.

Southcentral Alaska is the most populated, industrialized area in the state. Belugas are predominantly found in nearshore waters, where they must compete with people for use of nearshore habitats. Alteration of habitat may occur indirectly due to bridges, vessels, in-water noise, and discharges affecting water quality. While over 90 percent of Knik Arm is undeveloped, there are several planned or proposed projects in a relatively confined portion of lower Knik Arm (see Conservation Plan for a partial list). As an important feeding area for belugas during the summer and fall, development could restrict passage along Knik Arm.

Vessel traffic may pose the threat of ship strikes to belugas, although ship strikes have not been definitively confirmed in a Cook Inlet beluga death. Port facilities are located at Anchorage, Point MacKenzie, Tyonek, Drift River, Nikiski, Kenai, Anchor Point, and Homer in Cook Inlet. Commercial shipping occurs year round, commercial fishing vessels operate throughout the Inlet, and sport fishing and recreational vessels are common. Belugas may avoid areas with high levels of boat traffic; displacement from transit areas or from sensitive feeding or calving habitats could be harmful to Cook Inlet belugas.

Belugas use sound instead of vision for many important functions, and in Cook Inlet, they must compete acoustically with natural and anthropogenic sounds. Vessels, oil and gas drilling, marine seismic surveys, pile driving, and dredging all increase the level of noise, and may mask communication between belugas.

4.7.3 Conclusion

Based on the review of past, present and future actions that impact the target marine mammal species, the incremental contribution of the short-lived impacts associated with the proposed action is not anticipated to result in significant cumulative impacts to the human environment.

All of the issues noted above are likely to have some level of impact on Cook Inlet beluga whales. Based on the analysis conducted under this EA, NMFS expects that the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions discussed here and in the accompanying Biological Opinion (NMFS 2009) would be minimal and not significant. While the effects of repeated or chronic disturbance from scientific research activities should not be dismissed, the potential long-term benefits and value of information gained also must be considered. The research would provide information that would help manage and recover the endangered species.

NMFS believes that these activities would not have a significant cumulative effect on the target cetacean species or the human environment. NMFS expects that issuance of Permit No. 14210 and Permit Amendment No. 782-1709-08, as proposed, would not likely jeopardize the continued existence of the Cook Inlet DPS of beluga whale. Further, NMFS believes issuance of the permit would be consistent with the goals of the ESA and MMPA.

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

This document was prepared by Kristy Beard with the Permits, Conservation and Education Division of NMFS' Office of Protected Resources in Silver Spring, Maryland.

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