



NOAA FISHERIES

PROPOSED ACTION: Issuance of an Incidental Harassment Authorization to Bluecrest Alaska Operating LLC for the Take of Marine Mammals Incidental to Drilling Activities in Cook Inlet, Alaska.

TYPE OF STATEMENT: Draft Environmental Assessment

LEAD AGENCY: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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ABSTRACT: This Environmental Assessment analyzes the environmental impacts of the National Marine Fisheries Service, Office of Protected Resources proposal to issue an Incidental Harassment Authorization, pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act, to Bluecrest Alaska Operating LLC for the take of small numbers of marine mammals incidental to conducting an exploratory drilling program in Cook Inlet, Alaska.

DATE: September 2014

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LIST OF ACRONYMS AND ABBREVIATIONS

ADCCE	Alaska Department of Commerce, Community, and Economic
ANO	Alaska Native Organization
Apache	Apache Alaska Corporation
APDES	Alaska Pollutant Discharge Elimination System
Authorization	Incidental Harassment Authorization
Bluecrest	Bluecrest Alaska Operating LLC
BOEM	Bureau of Ocean Energy Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dB re 1 μ Pa	decibel referenced to one microPascal
EA	Environmental Assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ft	feet
FR	Federal Register
Hz	Hertz
in ³	cubic inch
IPCC	Intergovernmental Panel on Climate Change
kg	kilogram
km	kilometer
km ²	square kilometer
m	meter
mi	miles
MMPA	Marine Mammal Protection Act
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OMB	Office of Management and Budget
ORPC	Ocean Renewable Power Company
POA	Port of Anchorage
PSO	Protected Species Observer
rms	root-mean-squared
SPL	Sound pressure level
VSP	Vertical seismic profile

Chapter 1 Introduction and Purpose and Need

1.1. Description of Proposed Action

The Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1631 *et seq.*) prohibits the incidental taking of marine mammals. The incidental take of a marine mammal falls under three categories: mortality, serious injury, or harassment, which includes injury and behavioral effects. The MMPA defines harassment as any act of pursuit, torment, or annoyance which: (1) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (2) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

There are exceptions, however, to the MMPA's prohibition on take. The National Marine Fisheries Service, Office of Protected Resources, Permits and Conservation Division (NMFS, hereinafter, we) may authorize the incidental taking of small numbers of marine mammals by harassment upon the request of a U.S. citizen provided we follow certain statutory and regulatory procedures and make determinations. We discuss this exception in more detail in section 1.2.

In response to Bluecrest Alaska Operating LLC's (Bluecrest) request, we propose to issue an Incidental Harassment Authorization (Authorization) to Bluecrest under Section 101(a)(5)(D) of the MMPA, which would allow Bluecrest to take small numbers of marine mammals, incidental to the conduct of Bluecrest's proposed exploratory drilling program in lower Cook Inlet, Alaska. We do not have the authority to permit, authorize, or prohibit Bluecrest's exploratory drilling program under Section 101(a)(5)(D) of the MMPA, as that authority lies with a different agency.

Our issuance of an Authorization to Bluecrest is a major federal action under the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality (CEQ) regulations in 40 CFR §§ 1500-1508, and NOAA Administrative Order (NAO) 216-6. Thus, we are required to analyze the effects on the human environment.

This Draft Environmental Assessment (EA), titled "*Issuance of an Incidental Harassment Authorization to Bluecrest Alaska Operating LLC for the Take of Marine Mammals Incidental to Drilling Activities in Cook Inlet, Alaska*," (hereinafter, Draft EA) addresses the potential environmental impacts of two alternatives available to us under section 101(a)(5)(D) of the MMPA, namely:

- Issue the Authorization to Bluecrest for Level B harassment take of marine mammals under the MMPA during their exploratory drilling program, taking into account the prescribed means of take, mitigation measures, and monitoring requirements; or
- Not issue an Authorization to Bluecrest in which case, for the purposes of NEPA analysis only, we assume that the activities would proceed and cause incidental take without the mitigation and monitoring measures prescribed in the proposed Authorization.

1.1.1. Background on Bluecrest's MMPA Application

Bluecrest proposes to conduct an exploratory drilling program in Cook Inlet, Alaska. The activity would occur for approximately 90 days between early to mid-April and end of October 2015. Bluecrest's primary objective is to determine if there are oil and gas resources at this well location. Acoustic stimuli

generated by the drill rig, impact hammer, and airgun array have the potential to cause behavioral disturbances to marine mammals in the proposed exploratory drilling area.

1.1.2. Marine Mammals in the Action Area

The proposed exploratory drilling program could adversely affect the following marine mammal species under our jurisdiction:

- Harbor seal (*Phoca vitulina richardsi*)
- Killer whale (*Orcinus orca*)
- Harbor porpoise (*Phocoena phocoena*)
- Dall's porpoise (*Phocoenoides dalli*)
- Gray whale (*Eschrichtius robustus*)
- Minke whale (*Balaenoptera acutorostrata*)

While beluga whales (*Delphinapterus leucas*) and Steller sea lions (*Eumetopias jubatus*) occur in Cook Inlet, as described in more detail in Section 1.4.1 of this Draft EA, the issuance of take of these two species is not considered in the MMPA Authorization. Encounters with beluga whales in lower Cook Inlet between May and September is less common. Moreover, mitigation measures to avoid take of these two species is proposed for inclusion in any issued Authorization. Therefore, these two species are not considered in Chapters 3 and 4 of this Draft EA.

Humpback whales (*Megaptera novaeangliae*) are common in the very southern part of Cook Inlet and are sometimes sighted in Cook Inlet north of Homer. However, those occurrences are considered rare or extralimital. The northern edge of their occurrence in Cook Inlet is considered the southern edge of Kachemak Bay, which is more than 30 miles south of the proposed exploratory drilling site. It is rare for humpback whales to venture north of Kachemak Bay (B. Mahoney, NMFS, pers. comm., August 2014). Therefore, humpback whales are not considered further in this Draft EA.

1.2. Purpose and Need

The MMPA prohibits “takes” of marine mammals, with a number of specific exceptions. The applicable exception in this case is an authorization for incidental take of marine mammals in section 101(a)(5)(D) of the MMPA.

Section 101(a)(5)(D) of the MMPA directs the Secretary of Commerce (Secretary) to authorize, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by United States citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if we make certain findings and provide a notice of a proposed authorization to the public for review.

We have issued regulations to implement the Incidental Take Authorization provisions of the MMPA (50 CFR Part 216) and have produced Office of Management and Budget (OMB)-approved application instructions (OMB Number 0648-0151) that prescribe the procedures necessary to apply for authorizations. All applicants must comply with the regulations at 50 CFR § 216.104 and submit applications requesting incidental take according to the provisions of the MMPA.

Purpose: The primary purpose of our proposed action is to authorize the take of marine mammals incidental to Bluecrest’s proposed exploratory drilling program. The Authorization, if issued, would exempt Bluecrest from the take prohibitions contained in the MMPA.

To authorize the take of small numbers of marine mammals, we must evaluate the best available scientific information to determine whether the take would have a negligible impact on marine mammals or stocks and not have an unmitigable impact on the availability of affected marine mammal species for certain subsistence uses.

In addition, we must prescribe, where applicable, the permissible methods of taking and other means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat (i.e., mitigation), paying particular attention to rookeries, mating grounds, and other areas of similar significance. If appropriate, we must also prescribe means of effecting the least practicable impact on the availability of the species or stocks of marine mammals for subsistence uses. Authorizations must also include requirements or conditions pertaining to the monitoring and reporting of such taking in large part to better understand the effects of such taking on the species.

Need: On July 16, 2014, Bluecrest submitted an adequate and complete application demonstrating both the need and potential eligibility for issuance of an Authorization in connection with the activities described in section 1.1.1. We now have a corresponding duty to determine whether and how we can authorize take by Level B harassment incidental to the activities described in Bluecrest's application. Our responsibilities under section 101(a)(5)(D) of the MMPA and its implementing regulations establish and frame the need for this proposed action.

Any alternatives considered under NEPA must meet the agency's statutory and regulatory requirements. Our described purpose and need guide us in developing reasonable alternatives for consideration, including alternative means of mitigating potential adverse effects.

1.3. The Environmental Review Process

NEPA compliance is necessary for all "major" federal actions with the potential to significantly affect the quality of the human environment. Major federal actions include activities fully or partially funded, regulated, conducted, authorized, or approved by a federal agency. Because our issuance of an Authorization would allow for the taking of marine mammals consistent with provisions under the MMPA and incidental to the applicant's activities, we consider this as a major federal action subject to NEPA.

Under the requirements of NAO 216-6 section 6.03(f)(2)(b) for incidental harassment authorizations, we prepared this Draft EA to determine whether the direct, indirect and cumulative impacts related to the issuance of an Authorization for incidental take of marine mammals under the MMPA during the conduct of Bluecrest's exploratory drilling program in Cook Inlet, Alaska, could be significant. If we deem the potential impacts to be not significant, this analysis, in combination with other analyses incorporated by reference, may support the issuance of a Finding of No Significant Impact for the proposed Authorization.

1.3.1. Laws, Regulations, or Other NEPA Analyses Influencing the EA's Scope

We have based the scope of the proposed action and nature of the two alternatives considered in this Draft EA on the relevant requirements in section 101(a)(5)(D) of the MMPA. Thus, our authority under the MMPA bounds the scope of our alternatives. We conclude that this analysis—when combined with the analyses in the following documents—fully describes the impacts associated with the proposed exploratory drilling program, including any required mitigation and monitoring measures. After

conducting an independent review of the information and analyses for sufficiency and adequacy, we incorporate by reference the relevant analyses on Bluecrest's proposed action, as well as a discussion of the affected environment and environmental consequences within the following documents per 40 CFR 1502.21 and NAO 216-6 § 5.09(d):

- our notice of the proposed Authorization in the *Federal Register* (79 FR 54398, September 11, 2014); and
- *Application for the Incidental Harassment Authorization for the Taking of Non-listed Marine Mammals in Conjunction with the Bluecrest Alaska Operating LLC Activities at Cosmopolitan State Unit, Alaska, 2014* (Owl Ridge Natural Resource Consultants, Inc., 2014).

MMPA APPLICATION AND NOTICE OF THE PROPOSED AUTHORIZATION

The CEQ regulations (40 CFR §1502.25) encourage federal agencies to integrate NEPA's environmental review process with other environmental review laws. We rely substantially on the public process for developing proposed Authorizations and evaluating relevant environmental information and provide a meaningful opportunity for public participation as we develop corresponding EAs. We fully consider public comments received in response to our publication of the notice of proposed Authorization during the corresponding NEPA process.

On September 11, 2014, we published a notice of proposed Authorization in the *Federal Register* (79 FR 54398), which included the following:

- a detailed description of the proposed action and an assessment of the potential impacts on marine mammals and their habitat and the availability of marine mammals for subsistence uses;
- plans for Bluecrest's mitigation and monitoring measures to avoid and minimize potential adverse impacts to marine mammals and their habitat and proposed reporting requirements; and
- our preliminary findings under the MMPA.

We considered Bluecrest's proposed exploratory drilling program and associated mitigation and monitoring measures that would effect the least practicable impact on marine mammals and preliminarily determined that the proposed exploratory drilling program in Cook Inlet, Alaska, during the open water season, would result, at worst, in a modification in behavior (Level B harassment) of certain species of marine mammals. In addition, we preliminarily determined that the activity would not have an unmitigable adverse impact on the availability of marine mammals for subsistence uses. Our *Federal Register* notice invites comments from the public on both the proposed Authorization and this Draft EA for 30 days. All comments received during the public comment period will be considered in the Final EA and prior to making a final decision on whether to issue the final Authorization.

1.3.2. Scope of Environmental Analysis

Given the limited scope of the decision for which we are responsible, this Draft EA provides more focused information on the primary issues and impacts of environmental concern related specifically to our issuance of the Authorization. This EA does not further evaluate effects to the elements of the human environment listed in Table 1 because we have determined through previous environmental reviews that the issuance of our Authorization would not affect those components of the human environment.

Table 1. Components of the human environment not affected by our issuance of an Authorization.

Biological	Physical	Socioeconomic / Cultural
Amphibians	Air Quality	Commercial Fishing
Humans	Essential Fish Habitat	Military Activities
Non-Indigenous Species	Geography	Oil and Gas Activities
Seabirds	Land Use	Recreational Fishing
	Oceanography	Shipping and Boating
	State Marine Protected Areas	National Historic Preservation Sites
	Federal Marine Protected Areas	National Trails and Nationwide Inventory of Rivers
	National Estuarine Research Reserves	Low Income Populations
	National Marine Sanctuaries	Minority Populations
	Park Land	Indigenous Cultural Resources
	Prime Farmlands	Public Health and Safety
	Wetlands	Historic and Cultural Resources
	Wild and Scenic Rivers	
	Ecologically Critical Areas	

1.3.3. NEPA Public Process Summary

NAO 216-6 established agency procedures for complying with NEPA and the implementing NEPA regulations issued by the CEQ. Consistent with the intent of NEPA and the clear direction in NAO 216-6 to involve the public in NEPA decision-making, we are requesting comments on the potential environmental impacts described in Bluecrest’s MMPA application, the *Federal Register* notice of the proposed Authorization, and this Draft EA. The CEQ regulations further encourage agencies to integrate the NEPA review process with review under the environmental statutes. Consistent with agency practice, we integrated our NEPA review and preparation of this EA with the public process required by the MMPA for the proposed issuance of an Authorization.

The *Federal Register* notice of the proposed Authorization, combined with our preliminary determinations, supporting analyses, and corresponding public comment period are instrumental in providing the public with information on relevant environmental issues and offering the public a meaningful opportunity to provide comments to us for consideration in both the MMPA and NEPA decision-making processes. We posted Bluecrest’s application on our [website](#) concurrently with the release of the *Federal Register* notice of the proposed Authorization and this Draft EA.

1.4. Other Permits, Licenses, or Consultation Requirements

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary for NMFS to implement the proposed action.

1.4.1. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) and implementing regulations at 50 CFR §402 require 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 critical habitat. NMFS’ issuance of an Authorization affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these section 7 consultation requirements. Accordingly, NMFS is required to ensure that its action is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat for such species.

There are two marine mammal species under NMFS’ jurisdiction listed as endangered under the ESA with confirmed or possible occurrence in the proposed project area (i.e., Cook Inlet): the Cook Inlet beluga whale, and the Steller sea lion. Additionally, while critical habitat for beluga whales exists within Cook Inlet, the proposed action falls outside designated critical habitat for the Cook Inlet beluga whale.

The U.S. Army Corps of Engineers consulted with NMFS on this proposed project pursuant to section 7 of the ESA. On April 25, 2013, NMFS concluded that the proposed exploratory drilling program in lower Cook Inlet is not likely to adversely affect beluga whales, beluga whale critical habitat, or Steller sea lions. The Letter of Concurrence concluded that it was highly unlikely that beluga whales would occur in the proposed drilling location during project activities, and the mitigation measures required by the letter to protect such whales and Steller sea lions (should they be present) would further minimize the likelihood of take.

The U.S. Army Corps of Engineers has requested a reinitiation of the consultation that concluded in April 2013, and submitted a revised biological assessment to NMFS because the original section 7 consultation was conducted based on the fact that two wells would be drilled at the Cosmopolitan location (instead of just one proposed for 2015) and by Buccaneer, not Bluecrest. That informal consultation will be concluded prior to a final determination on Bluecrest’s MMPA Authorization request. Mitigation measures laid out in the April 25, 2013, section 7 Letter of Concurrence to ensure no take of beluga whales and Steller sea lions have been included in the proposed action (see Section 2.3.1). Any new measures that arise from the new informal consultation would also be included in any issued Authorization. Therefore, NMFS’ Office of Protected Resources does not intend to initiate formal consultation under section 7 of the ESA. Because our proposed action in this Draft EA is the issuance of take incidental to the exploratory drilling program, this EA only analyzes impacts to marine mammals for which take is proposed to be authorized under the MMPA.

1.4.2. Marine Mammal Protection Act

The MMPA and its provisions that pertain to the proposed action are discussed above in section 1.2.

1.4.3. Magnuson-Stevens Fishery Conservation and Management Act

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Federal agencies are required to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency which may adversely affect essential fish habitat (EFH) identified under the MSFCMA. EFH has been identified in Cook Inlet for walleye Pollock, rock sole, Pacific cod, skate, weathervane scallop, Pacific salmon, and sculpin. NMFS’ action of authorizing harassment of marine mammals in the form of an Authorization does not impact EFH; therefore, an EFH consultation was not conducted.

Chapter 2 Alternatives

2.1. Introduction

The NEPA and the implementing CEQ regulations (40 CFR §§ 1500-1508) require consideration of alternatives to proposed major federal actions, and NAO 216-6 provides agency policy and guidance on the consideration of alternatives to our proposed action. An EA must consider all reasonable alternatives, including the No Action Alternative. This provides a baseline analysis against which we can compare the other alternatives.

To warrant detailed evaluation as a reasonable alternative, an alternative must meet our purpose and need. In this case, as we previously explained, an alternative meets the purpose and need if it satisfies the requirements under section 101(a)(5)(D) the MMPA. We evaluated each potential alternative against these criteria; identified one action alternative along with the No Action Alternative; and carried these forward for evaluation in this Draft EA.

Alternative 1 includes a suite of mitigation measures intended to minimize any potentially adverse effects to marine mammals. This chapter describes the alternatives and compares them in terms of their environmental impacts and their achievement of objectives.

2.2. Description of Bluecrest's Proposed Activities

We presented a general overview of Bluecrest's proposed exploratory drilling program in our *Federal Register* notice of proposed Authorization (79 FR 54398, September 11, 2014). Also, Bluecrest's application (Owl Ridge Natural Resource Consultants, Inc., 2014) describes the drilling program in detail. We incorporate those descriptions by reference in this EA and briefly summarize them here.

2.2.1. Specified Time and Specified Area

Bluecrest proposes to conduct the one well exploratory drilling program during the 2015 open water season (approximately April 15 through October 31). Bluecrest estimates that the drilling period could extend up to 90 days, including up to 15 days of well testing. During this time period, conductor pipe driving would only occur for a period of 1 to 3 days (although actual sound generation would occur only intermittently during this time period), and vertical seismic profiling (VSP) operations would only occur for a period of less than 1 to 2 days. Mobilization and demobilization rig tows are estimated to take less than 24 hours. This IHA (if issued) would be effective for 1 year, beginning on April 1, 2015.

Bluecrest's proposed program would occur at Cosmopolitan State #B-1 (originally Cosmopolitan #2) in lower Cook Inlet, AK, approximately seven miles north of Anchor Point. The exact well location is latitude 59° 52' 13.887" N., 151° 52' 17.225" W. in water depth of 61 ft and is only a few miles from shore. The exact location of Bluecrest's well site can be seen in Figure 1.

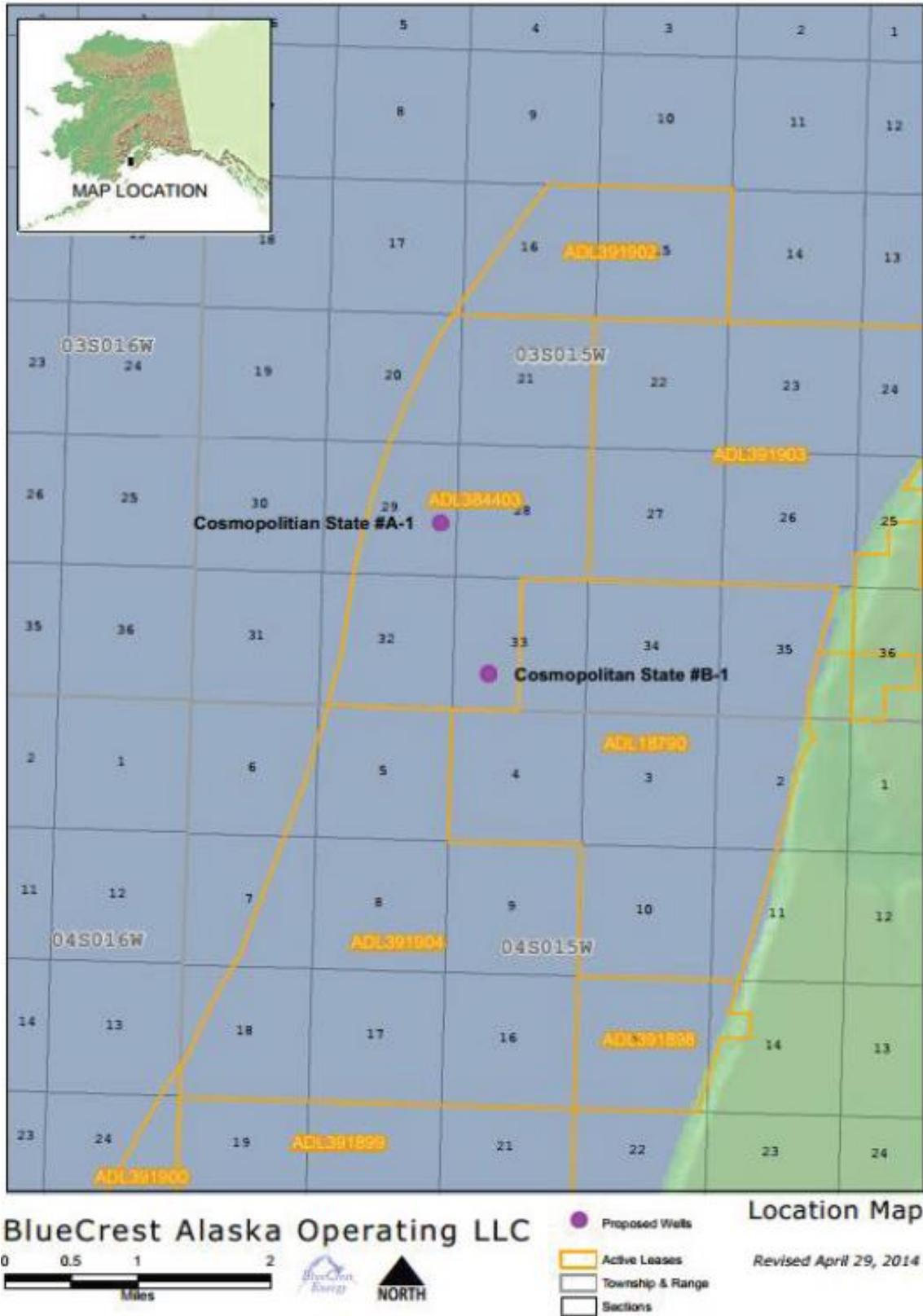


Figure 1. Location of the proposed Bluecrest Cosmopolitan Unit well sites in lower Cook Inlet, Alaska.

2.2.2. Exploratory Drilling Operations

Bluecrest proposes to conduct exploratory drilling operations at one well site in lower Cook Inlet during the 2015 open water (ice-free) season (i.e., April through October), using the *Endeavour-Spirit of Independence (Endeavour)* jack-up drill rig or the *Spartan 151* jack-up drill rig, depending on availability. The rig would be towed to the drilling site by ocean-going tugs. The activities of relevance to this analysis include: mobilization and demobilization of the drill rig to and from the well location at the start and end of the season; driving of the conductor pipe; exploratory drilling; and VSP operations. Bluecrest proposes to utilize both helicopters and vessels to conduct resupply, crew change, and other logistics during the exploratory drilling program. The jack-up drilling rig *Endeavour's* drilling platform and other noise-generating equipment is located above the sea's surface, and there is very little surface contact with the water compared to drill ships and semi-submersible drill rigs; therefore, lattice-legged jack-up drill rigs are relatively quiet (Richardson et al., 1995a; Spence et al., 2007).

A conductor pipe is a relatively short, large-diameter pipe driven into the sediment prior to the drilling of oil wells. This section of tubing serves to support the initial sedimentary part of the well, preventing the looser surface layer from collapsing and obstructing the wellbore. The pipe also facilitates the return of cuttings from the drill head. Conductor pipes are usually installed using drilling, pile driving, or a combination of these techniques. In offshore wells, the conductor pipe is also used as a foundation for the wellhead. Bluecrest proposes to drive approximately 200 ft (60 m) below mudline of 30-inch conductor pipe at Cosmopolitan State #B-1 prior to drilling using a Delmar D62-22 impact hammer. This hammer has impact weight of 13,640 pounds (6,200 kg) and reaches a maximum impact energy of 165,215 foot-pounds (224 kilonewton-meters) at a drop height of 12 ft (3.6 m).

Once a well is drilled, accurate follow-up seismic data can be collected by placing a receiver at known depths in the borehole and shooting a seismic airgun at the surface near the borehole. The gathered data provide not only high resolution images of the geological layers penetrated by the borehole but can be used to accurately correlate (or correct) the original surface seismic data. The procedure is known as VSP. Bluecrest intends to conduct VSP operations at the end of drilling the well using an array of airguns with total volumes of between 600 and 880 cubic inches (in³). The VSP operation is expected to last less than one or two days. Additional details on the components of the exploratory drilling program can be found in our *Federal Register* notice of the proposed Authorization and Bluecrest's application (Owl Ridge Natural Resource Consultants, Inc., 2014).

2.3. Description of Alternatives

2.3.1. Alternative 1 – Issuance of an Authorization with Mitigation Measures

The Proposed Action constitutes Alternative 1 and is the Preferred Alternative. Under this alternative, we would issue an Authorization (valid from April 2015 through March 2016) to Bluecrest allowing the incidental take, by Level B harassment, of six species of marine mammals subject to the mandatory mitigation and monitoring measures and reporting requirements set forth in the proposed Authorization, if issued, along with any additions based on consideration of public comments.

MITIGATION AND MONITORING MEASURES

As described in Section 1.2.1, we must prescribe the means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat. In order to do so, we must consider Bluecrest's proposed mitigation measures, as well as other potential measures, and assess how such measures could

benefit the affected species or stocks and their habitat. Our evaluation of potential measures includes consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, we expect the successful implementation of the measures to minimize adverse impacts to marine mammals; (2) the proven or likely efficacy of the measures to minimize adverse impacts as planned; and (3) the practicability of the measures for applicant implementation.

Any additional mitigation measure proposed by us beyond what the applicant proposes should be able to or have a reasonable likelihood of accomplishing or contributing to the accomplishment of one or more of the following goals:

- Avoidance or minimization of marine mammal injury, serious injury, or death wherever possible;
- A reduction in the numbers of marine mammals taken (total number or number at biologically important time or location);
- A reduction in the number of times the activity takes individual marine mammals (total number or number at biologically important time or location);
- A reduction in the intensity of the anticipated takes (either total number or number at biologically important time or location);
- Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base; activities that block or limit passage to or from biologically important areas; permanent destruction of habitat; or temporary destruction/disturbance of habitat during a biologically important time; and
- For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

To reduce the potential for disturbance from acoustic stimuli associated with the activities, Bluecrest has proposed to implement several monitoring and mitigation measures for marine mammals. NMFS has proposed some additional measures. The proposed monitoring and mitigation measures include:

- (1) Utilize a sufficient number of vessel-based Protected Species Observers (PSOs) to visually watch for and monitor marine mammals near the drill rig during daytime operations (from nautical twilight-dawn to nautical twilight-dusk) and before and during start-ups of sound sources day or night. PSOs shall have access to reticle binoculars, big-eye binoculars, and night vision devices. PSO shifts shall last no longer than 4 hours at a time. PSOs shall also make observations during daytime periods when the sound sources are not operating for comparison of animal abundance and behavior, when feasible. When practicable, as an additional means of visual observation, drill rig or vessel crew may also assist in detecting marine mammals. Within safe limits, the PSOs should be stationed where they have the best possible viewing. PSOs should be instructed to identify animals as unknown where appropriate rather than strive to identify a species if there is significant uncertainty.
- (2) Conductor Pipe Driving Mitigation:
 - a. PSOs will observe from the drill rig during impact hammering out to the 160 dB re 1 μ Pa (rms) radius of 1.6 km (1 mi). If marine mammal species for which take is not authorized are about to enter this zone, then use of the impact hammer will cease.
 - b. If cetaceans for which take is authorized approach or enter within the 180 dB re 1 μ Pa (rms) radius of 250 m (820 ft) or if pinnipeds for which take is authorized approach or

enter within the 190 dB re 1 μ Pa (rms) radius of 60 m (200 ft), then use of the impact hammer will cease. Following a shutdown of impact hammering activities, the applicable zones must be clear of marine mammals for at least 30 minutes prior to restarting activities.

- c. PSOs will visually monitor out to the 160 dB re 1 μ Pa (rms) radius for at least 30 minutes prior to the initiation of activities. If no marine mammals are detected during that time, then Bluecrest can initiate impact hammering using a “soft start” technique. Hammering will begin with an initial set of three strikes at 40 percent energy followed by a 1 min waiting period, then two subsequent three-strike sets. This “soft-start” procedure will be implemented anytime impact hammering has ceased for 30 minutes or more. Impact hammer “soft-start” will not be required if the hammering downtime is for less than 30 minutes and visual surveys are continued throughout the silent period, and no marine mammals are observed in the applicable zones during that time.
- (3) VSP Airgun Mitigation:
- a. PSOs will observe from the drill rig during airgun operations out to the 160 dB re 1 μ Pa (rms) radius of 2.5 km (1.55 mi). If marine mammal species for which take is not authorized are about to enter this zone, then use of the airguns will cease.
 - b. If cetaceans for which take is authorized approach or enter within the 180 dB re 1 μ Pa (rms) radius of 240 m (787 ft) or if pinnipeds for which take is authorized approach or enter within the 190 dB re 1 μ Pa (rms) radius of 120 m (394 ft), then use of the airguns will cease. Following a shutdown of airgun operations, the applicable zones must be clear of marine mammals for at least 30 minutes prior to restarting activities.
 - c. PSOs will visually monitor out to the 160 dB re 1 μ Pa (rms) radius for at least 30 minutes prior to the initiation of activities. If no marine mammals are detected during that time, then Bluecrest can initiate airgun operations using a “ramp-up” technique. Airgun operations will begin with the firing of a single airgun, which will be the smallest gun in the array in terms of energy output (dB) and volume (in³). Operators will then continue ramp-up by gradually activating additional airguns over a period of at least 30 minutes (but not longer than 40 minutes) until the desired operating level of the airgun array is obtained. This ramp-up procedure will be implemented anytime airguns have not been fired for 30 minutes or more. Airgun ramp-up will not be required if the airguns have been off for less than 30 minutes and visual surveys are continued throughout the silent period, and no marine mammals are observed in the applicable zones during that time.
- (4) No initiation of survey operations involving the use of sound sources is permitted from a shutdown position at night or during low-light hours (such as in dense fog or heavy rain).

In addition to the mitigation measures proposed by Bluecrest, we have proposed additional mitigation measures:

- (1) If any marine mammal species for which take is not authorized are encountered during exploratory drilling operations and are likely to be exposed to sound pressure levels (SPLs) greater than or equal to 160 dB re 1 μ Pa (rms) for impulse sources or greater than or equal to 120 dB re 1 μ Pa (rms), then Bluecrest must shut-down the sound source prior to the animal entering the applicable Level B isopleth to avoid take.

- (2) During rig towing operations, speed will be reduced to 8 knots or less, as safety allows, at the approach of any whales or Steller sea lions within 2,000 ft (610 m) of the towing operations.
- (3) Helicopters must maintain an altitude of at least 1,000 ft (305 m), except during takeoffs, landings, or emergency situations.
- (4) Live Stranding Event Mitigation:
 - a. Should Bluecrest become aware of a live stranding event (from NMFS or another source), Bluecrest must immediately implement a shutdown of the airgun array.
 - i. A shutdown must be implemented whenever the animal is within 5 km of the seismic airguns.
 - ii. Shutdown procedures will remain in effect until NMFS determines that, and advises Bluecrest that, all live animals involved in the stranding have left the area (either of their own volition or following herding by responders).
 - b. Within 48 hours of the notification of the live stranding event, Bluecrest must inform NMFS where and when they were operating airguns and at what discharge volumes.
 - c. Bluecrest must appoint a contact who can be reached 24/7 for notification of live stranding events. Immediately upon notification of the live stranding event, this person must order the immediate shutdown of the airguns.

Bluecrest proposes to sponsor marine mammal monitoring during the present project, in order to implement the mitigation measures that require real-time monitoring and to satisfy the monitoring requirements of the Authorization. The researchers would monitor the area for marine mammals during all activities. Monitoring would be conducted from vessels or the drill rig. Monitoring data would include the following:

- (1) Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from the PSO, apparent reaction to activities (e.g., none, avoidance, approach, paralleling, etc.), closest point of approach, and behavioral pace;
- (2) Time, location, speed, activity of the vessel, sea state, ice cover, visibility, and sun glare;
- (3) The positions of other vessel(s) in the vicinity of the PSO location (if applicable);
- (4) The rig's position, speed if under tow, and water depth, sea state, ice cover, visibility, and sun glare will also be recorded at the start and end of each observation watch, every 30 minutes during a watch, and whenever there is a change in any of those variables.

REPORTING MEASURES

After conclusion of the exploratory drilling program and the effectiveness of the Authorization, Bluecrest would submit a draft Technical Report on all activities and monitoring results to NMFS' Permits and Conservation Division within 90 days. The Technical Report would include:

- (1) Summaries of monitoring effort (e.g., total hours, total distances, and marine mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals);
- (2) Analyses of the effects of various factors influencing detectability of marine mammals (e.g., sea state, number of observers, and fog/glare);

- (3) Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover;
- (4) Analyses of the effects of drilling operation activities; and
- (5) Sighting rates of marine mammals during periods with and without drilling operation activities (and other variables that could affect detectability), such as: (A) initial sighting distances versus activity state; (B) closest point of approach versus activity state; (C) observed behaviors and types of movements versus activity state; (D) numbers of sightings/individuals seen versus activity state; (E) distribution around the drill rig versus activity state; and (F) estimates of take by Level B harassment based on presence in the 120 dB and 160 dB harassment zones.

NMFS would review the draft 90-day Technical Report. Bluecrest must then submit a final report to the Chief, Permits and Conservation Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft report. If NMFS decides that the draft report needs no comments, the draft report shall be considered to be the final report.

In the unanticipated event that Bluecrest's specified activity clearly causes the take of a marine mammal in a manner prohibited by the Authorization, such as an injury (Level A harassment), serious injury, or mortality (e.g., ship-strike, gear interaction, and/or entanglement), Bluecrest shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, the Alaska Region Protected Resources Division, NMFS, and the Alaska Regional Stranding Coordinators. The report must include the following information:

- (1) Time, date, and location (latitude/longitude) of the incident;
- (2) The name and type of vessel involved;
- (3) The vessel's speed during and leading up to the incident;
- (4) Description of the incident;
- (5) Status of all sound source use in the 24 hours preceding the incident;
- (6) Water depth;
- (7) Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- (8) Description of marine mammal observations in the 24 hours preceding the incident;
- (9) Species identification or description of the animal(s) involved;
- (10) The fate of the animal(s); and
- (11) Photographs or video footage of the animal (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with Bluecrest to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Bluecrest may not resume their activities until notified by NMFS via letter or email, or telephone.

In the event that Bluecrest discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), Bluecrest would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, the Alaska Region Protected Resources Division, NMFS, and the NMFS Alaska Stranding

Hotline. The report must include the same information identified above. If the observed marine mammal is dead, activities may continue while NMFS reviews the circumstances of the incident. If the observed marine mammal is injured, measures described above regarding a live stranding event must be implemented. NMFS will work with Bluecrest to determine whether modifications in the activities are appropriate.

In the event that Bluecrest discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the Authorization (e.g., carcass with moderate to advanced decomposition or scavenger damage), Bluecrest shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, her designees, the Alaska Region Protected Resources Division, NMFS, the NMFS Alaska Stranding Hotline, and the Alaska Regional Stranding Coordinators within 24 hours of the discovery. Bluecrest shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. If the observed marine mammal is dead, activities may continue while NMFS reviews the circumstances of the incident. If the observed marine mammal is injured, measures described above regarding a live stranding event must be implemented. In this case, NMFS will notify Bluecrest when activities may resume.

In our *Federal Register* notice of proposed Authorization, which we incorporate by reference, we preliminarily determined that the measures included in the proposed Authorization were sufficient to reduce the effects of Bluecrest's activity on marine mammals to the level of least practicable impact. In addition, we described our analysis of impacts and preliminarily determined that the taking of small numbers of marine mammals, incidental to Bluecrest's action would have a negligible impact on the relevant species or stocks and would not have an unmitigable adverse impact on affected species or stocks for taking for subsistence uses. Accordingly, this Preferred Alternative would satisfy the purpose and need of our proposed action under the MMPA—issuance of an Authorization, along with required mitigation measures and monitoring that meets the standards set forth in section 101(a)(5)(D) of the MMPA and the implementing regulations. These proposed mitigation, monitoring, and reporting measures may change based on public comments received on the proposed Authorization and/or this Draft EA.

2.3.2. Alternative 2 – No Action Alternative

We are required to evaluate the No Action Alternative per CEQ NEPA regulations. The No Action Alternative serves as a baseline to compare the impacts of the Preferred and other alternatives. Under the No Action Alternative, we would not issue the requested Authorization to Bluecrest.

Under the No Action Alternative, Bluecrest could choose not to proceed with their proposed activities or to proceed without an Authorization. If they choose the latter, Bluecrest would not be exempt from the MMPA prohibitions against the take of marine mammals and would be in violation of the MMPA if take of marine mammals occurs.

For purposes of this EA, we characterize the No Action Alternative as Bluecrest not receiving an Authorization and Bluecrest conducting the Cook Inlet exploratory drilling program without the protective measures and reporting requirements required by an Authorization under the MMPA. We take

this approach to meaningfully evaluate the primary environmental issues relevant to the No Action Alternative—the impact on marine mammals from these activities in the absence of protective measures.

2.4. Alternatives Considered but Eliminated from Further Consideration

NMFS considered whether other alternatives could meet the purpose and need and support Bluecrest’s proposed activities. An alternative that would allow for the issuance of an Authorization with no required mitigation or monitoring was considered but eliminated from consideration, as it would not be in compliance with the MMPA and therefore would not meet the purpose and need. For that reason, this alternative is not analyzed further in this document.

Chapter 3 Affected Environment

This chapter describes existing conditions in the proposed action area. Complete descriptions of the physical, biological, and social environment of the action area are contained in the documents listed in Section 1.3.1 of this EA. We incorporate those descriptions by reference and briefly summarize or supplement the relevant sections for marine mammals in the following subchapters.

3.1. Physical Environment

We are required to consider impacts to the physical environment under NOAA NAO 216-6. As discussed in Chapter 1, our proposed action and alternatives relate only to the authorization of incidental take of marine mammals and not to the physical environment. Certain aspects of the physical environment are not relevant to our proposed action (see subchapter 1.3.2 - Scope of Environmental Analysis). Because of the requirements of NAO 216-6, we briefly summarize the physical components of the environment of relevance here.

3.1.1. Marine Mammal Habitat

We presented information on marine mammal habitat and the potential impacts to marine mammal habitat in the *Federal Register* notice of the proposed Authorization. In summary, beluga whales, harbor porpoise, and harbor seals use the waters of Cook Inlet for foraging, calving, and other important life history functions. The mouths of river streams are important beluga whale feeding habitat. Harbor seals also use coastal haul-outs in Cook Inlet.

Pursuant to the ESA, critical habitat has been designated for Cook Inlet beluga whales and Steller sea lions. The proposed drilling site does not fall within critical habitat designated in Cook Inlet for beluga whales or within critical habitat designated for Steller sea lions. The Cosmopolitan State unit is nearly 100 miles south of beluga whale Critical Habitat Area 1 and approximately 27 miles south of Critical Habitat Area 2. It is also located about 25 miles north of the isolated patch of Critical Habitat Area 2 found in Kachemak Bay. Area 2 is based on dispersed fall and winter feeding and transit areas in waters where whales typically appear in smaller densities or deeper waters (76 FR 20180, April 11, 2011). Figure 2 identifies Cook Inlet beluga whale critical habitat. Bluecrest's proposed drill site occurs just north of Homer, outside any designated critical habitat.

3.2. Biological Environment

3.2.1. Marine Mammals

We provide information on the occurrence of marine mammals most likely present in the proposed seismic survey areas in section 1.1.2 of this EA. The marine mammals most likely to be harassed incidental to conducting the exploratory drilling program in lower Cook Inlet are: harbor seal; killer whale; harbor porpoise; gray whale; minke whale; and Dall's porpoise. None of these species are listed as threatened or endangered under the ESA, and none are categorized as depleted under the MMPA. We provided information on the distribution, population size, and conservation status for each species in the *Federal Register* notice on the proposed Authorization, and we incorporate those descriptions by reference here. Bluecrest's application (Owl Ridge Natural Resource Consultants, Inc., 2014) and our 2013 EA regarding the issuance of an Authorization to Apache Alaska Corporation for the take of marine mammals incidental to a three-dimensional seismic survey in Cook Inlet (NMFS 2013a) contain detailed

information on life history functions, hearing abilities, and distribution, of several of these marine mammal species, which are also incorporated by reference. A brief summary is provided next.

Data collected during marine mammal monitoring at Cosmopolitan State #A-1 during summer 2013 recorded 104 harbor porpoise, 72 harbor seals, 32 minke whales, 19 Dall's porpoise, 12 gray whales, and two killer whales between May and August (112 days of monitoring). Based on their seasonal patterns, gray whales are not likely to be encountered during spring. Minke whales have been considered migratory in Alaska (Allen and Angliss, 2014) but have recently been observed off Cape Starichkof and Anchor Point year-round. The remaining species could be encountered year-round. Table 2 provides a summary of the abundance and population status of the six marine mammal species for which take is proposed to be authorized. Table 3 provides information on the hearing ranges of marine mammals.

While Cook Inlet beluga whales and Steller sea lions occur in Cook Inlet, take is not proposed to be authorized for these two species, as mitigation and monitoring measures are proposed to avoid take of these species. Because our proposed action is the issuance of take of marine mammals, these two species are not considered further in this EA.

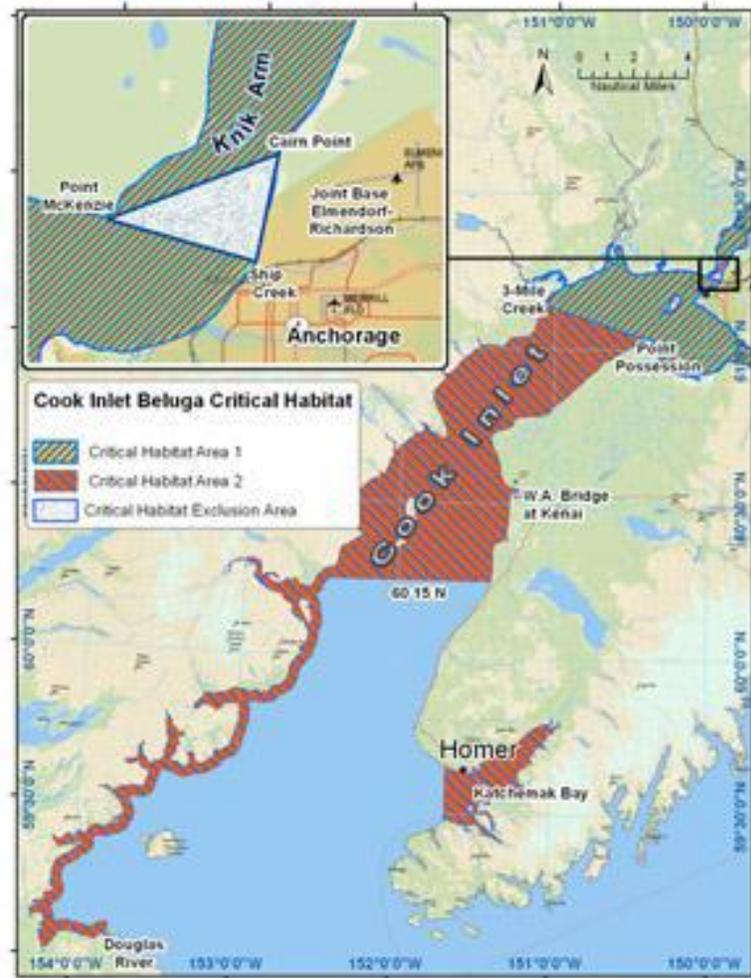


Figure 2. Final critical habitat of Cook Inlet beluga whales (76 FR 20180, April 11, 2011).

Table 2. Abundance estimates and population trends of the marine mammal species for which take is proposed to be authorized.

Species	Abundance	Trend
Harbor Seal	22,900	Stable
Harbor Porpoise	25,987	No reliable information
Killer Whale	1,123 (resident) 552 (transient)	Resident stock possibly increasing Transient stock stable
Gray whale	18,017	Stable/increasing
Minke whale	810-1,233	No reliable information
Dall's porpoise	83,400	No reliable information

Table 3. Classification of marine mammals that could potentially occur in the proposed exploratory drilling site and for which take is proposed to be authorized by functional hearing groups (Southall et al., 2007; NMFS, 2013b).

Low Frequency Hearing Range (7 Hz to 30 kHz)	Minke and gray whale
Mid-Frequency Hearing Range (150 Hz to 160 kHz)	Killer whale
High Frequency Hearing Rang (200 Hz to 180 kHz)	Harbor and Dall's porpoise
Phocid in Water Hearing Range (75 Hz to 100 kHz)	Harbor seal

3.3. Socioeconomic Environment

3.3.1. Subsistence

The subsistence harvest of marine mammals transcends the nutritional and economic values attributed to the animal and is an integral part of the cultural identity of the region's Alaska Native communities. Inedible parts of the whale provide Native artisans with materials for cultural handicrafts, and the hunting itself perpetuates Native traditions by transmitting traditional skills and knowledge to younger generations (NOAA, 2007).

The three communities closest to the Cosmopolitan proposed drill site with subsistence use areas are Homer, Ninilchik, and Kenai. Ninilchik Village and the Kenaitze Indian Tribe (Kenai) are both federally recognized as Native villages. Homer is not federally recognized as a Native village. According to 2010 U.S. Census data, the populations of Ninilchik, Kenai, and Homer were approximately 36 percent, 24 percent, and 12 percent American Indian or Alaska Native (ADCCE, 2014).

Native hunters historically have hunted beluga whales and harbor seals for food. The subsistence harvest of beluga transcends nutritional and economic value of the whale as the harvest is an integral part of the cultural identity of the region's Alaska Native communities. Inedible parts of the whale provide Native artisans with materials for cultural handicrafts, and the hunting perpetuates Native traditions by transmitting traditional skills and knowledge to younger generations. However, due to dramatic declines

in the Cook Inlet beluga whale population, on May 21, 1999, legislation was passed to temporarily prohibit (until October 1, 2000) the taking of Cook Inlet belugas under the subsistence harvest exemption in section 101(b) of the MMPA without a cooperative agreement between NMFS and the affected Alaska Native Organizations (ANOs) (Public Law No. 106-31, section 3022, 113 Stat. 57,100). That prohibition was extended indefinitely on December 21, 2000 (Public Law No. 106-553, section 1(a)(2), 114 Stat. 2762). NMFS subsequently entered into six annual co-management agreements (2000-2003, 2005-2006) with the Cook Inlet Marine Mammal Council, an ANO representing Cook Inlet beluga hunters, which allowed for the harvest of 1-2 belugas. On October 15, 2008, NMFS published a final rule that established long-term harvest limits on the Cook Inlet beluga whales that may be taken by Alaska Natives for subsistence purposes (73 FR 60976). That rule prohibits harvest for a five-year period (2008-2012), if the average abundance for the Cook Inlet beluga whales from the prior five years (2003-2007) is below 350 whales. The next five-year period that could allow for a harvest (2013-2017), would require the previous five-year average (2008-2012) to be above 350 whales. No beluga whale hunts occurred in 2013 or 2014, and none are proposed to occur in 2015.

There is a low level of subsistence hunting for harbor seals in Cook Inlet. Seal hunting occurs opportunistically among Alaska Natives. Some data are available on the subsistence harvest of harbor seals, harbor porpoises, and killer whales in Alaska in the marine mammal stock assessments. However, these numbers are for the Gulf of Alaska including Cook Inlet, and they are not indicative of the harvest in Cook Inlet. Some detailed information on the subsistence harvest of harbor seals is available from past studies conducted by the Alaska Department of Fish & Game (Wolfe et al., 2009). In 2008, only 33 harbor seals were taken for harvest in the Upper Kenai-Cook Inlet area. In the same study, reports from hunters stated that harbor seal populations in the area were increasing (28.6%) or remaining stable (71.4%). The specific hunting regions identified were Anchorage, Homer, Kenai, and Tyonek, and hunting generally peaks in March, September, and November (Wolfe et al., 2009). Since 1992, Alaska Natives from the Cook Inlet villages of Homer and Kenai have annually taken (harvested plus struck and lost) an average of 14-15 harbor seals. There are no data for Ninilchik alone. The villages are located between 14 mi (Ninilchik) and 50 mi (Kenai) away from the Cosmopolitan well site.

Chapter 4 Environmental Consequences

This chapter of the EA analyzes the impacts of the two alternatives on the human environment.

Bluecrest's application, our notice of a proposed Authorization, and other related environmental analyses identified previously inform our analysis of the direct, indirect, and cumulative effects of our proposed issuance of an Authorization.

Under the MMPA, we have evaluated the potential impacts of Bluecrest's exploratory drilling program operations in order to determine whether to authorize incidental take of marine mammals. Under NEPA, we have determined that an EA is appropriate to evaluate the potential significance of environmental impacts resulting from the issuance of our Authorization.

4.1. Effects of Alternative 1 – Issuance of an Authorization with Mitigation Measures

Alternative 1 is the Preferred Alternative where we would issue an Authorization to Bluecrest allowing the incidental take, by Level B harassment, of six species of marine mammals during the open water season, subject to the mandatory mitigation and monitoring measures and reporting requirements set forth in the Authorization (see Section 2.3.1), if issued.

4.1.1. Impacts to Marine Mammal Habitat

Our proposed action would have no additive or incremental effect on the physical environment beyond those resulting from the proposed activities. Bluecrest's proposed exploratory drill site is not located within a marine sanctuary or a National Park. State wildlife conservation areas have been designated in Cook Inlet; however, those occur mostly on land with some portions along the coasts and would not be impacted by our proposed action of the issuance of an Authorization to take marine mammals. Bluecrest's application and our notice of a proposed Authorization contain descriptions of habitat impacts and are incorporated by reference. A short summary is provided next.

The proposed exploratory drilling program would minimally add to vessel traffic in the region. The proposed activities would not result in substantial damage to ocean and coastal habitats that might constitute marine mammal habitat. The potential direct habitat impact by the Bluecrest drilling operation is limited to the actual drill-rig footprint defined as the area occupied and enclosed by the drill-rig legs. The jack-up rig would temporarily disturb one offshore location in lower Cook Inlet, where the well is proposed to be drilled. Bottom disturbance would occur in the area where the three legs of the rig would be set down and where the actual well would be drilled. The jack-up drill rig footprint would occupy three steel piles at 14 m (46 ft) diameter. The well casing would be a 76 cm (30 in) diameter pipe extending from the seafloor to the rig floor. The casing would only be in place during drilling activities at the well location. The total area of disturbance was calculated as 0.54 acres, which represents a very small fraction of the 7,300 square mile Cook Inlet surface area. Potential damage to the Cook Inlet benthic community would be limited to the actual surface area of the three spud cans (1,585 square feet each or 4,755 square feet total) that form the "foot" of each leg. Given the high tidal energy at the well site locations, drilling footprints are not expected to support benthic communities equivalent to shallow lower energy sites found in nearshore waters where harbor seals mostly feed. The presence of the drill rig is not expected to result in direct loss of marine mammal habitat. The Authorization would not impact physical habitat features, such as substrates and/or water quality.

In examining impacts to fish as prey species for marine mammals, we expect fish to exhibit a range of behaviors including no reaction or habituation (Peña et al., 2013) to startle responses and/or avoidance

(Fewtrell and McCauley, 2012). We expect that the exploratory drilling program would have no more than a temporary and minimal adverse effect on any fish or invertebrate species. Although there is a potential for injury to fish or marine life in close proximity to the equipment, we expect that the impacts of the exploratory drilling program on fish and other marine life specifically related to acoustic activities would be temporary in nature, negligible, and would not result in substantial impact to these species or to their role in the ecosystem.

Twelve effluents are authorized for discharge into Cook Inlet, including: drilling fluids and drill cuttings, deck drainage, sanitary waste, domestic waste, blowout preventer fluid, boiler blow down, fire control system test water, uncontaminated ballast water, bilge water, excess cement slurry, mud cuttings cement at sea floor, and completion fluids. Areas prohibited from discharge in the Cook Inlet are 10-meter (33-foot) isobaths, 5-meter (16-foot) isobaths, and other geographic area restrictions (AKG-31-5021.I.C.). Drilling wastes include drilling fluids, known as mud, rock cuttings, and formation waters. Drilling wastes (non-hydrocarbon) would be discharged to the Cook Inlet under the approved Alaska Pollutant Discharge Elimination System (APDES) general permit. Drilling wastes (hydrocarbon) would be delivered to an onshore permitted location for disposal. Bluecrest would follow best management practices to ensure that a sufficient inventory of barite and lost circulation materials are maintained on the drilling vessel to minimize the possibility of a well upset and the likelihood of a release of pollutants to Cook Inlet waters. Bluecrest plans to conduct an Environmental Monitoring Study of relevant hydrographic, sediment hydrocarbon, and heavy metal data from surveys conducted before and during drilling mud disposal and up to a least one year after drilling operations cease in accordance with the APDES general permit for discharges of drilling muds and cuttings. No hazardous wastes should be generated as a result of this project. However, if any hazardous wastes were generated, they would be temporarily stored in an onboard satellite accumulation area and then transported offsite for disposal at an approved facility.

With oil and gas platforms presently operating in Cook Inlet, there is concern for continuous exposure to potentially toxic heavy metals and metalloids (i.e., mercury, lead, cadmium, copper, zinc, and arsenic) that are associated with oil and gas development and production. These elements occur naturally in the earth's crust and the oceans but many also have anthropogenic origins from local sources of pollution or from contamination from atmospheric distribution. Discharging drill cuttings or other liquid waste streams generated by the drilling vessel could potentially affect marine mammal habitat. Toxins could persist in the water column, which could have an impact on marine mammal prey species. However, despite a considerable amount of investment in research on exposures of marine mammals to organochlorines or other toxins, there have been no marine mammal deaths in the wild that can be conclusively linked to the direct exposure to such substances (O'Shea, 1999). Drilling muds and cuttings discharged to the seafloor can lead to localized increased turbidity and increase in background concentrations of barium and occasionally other metals in sediments and may affect lower trophic organisms. Effects on benthic communities are nearly always restricted to a zone within about 328 to 492 ft (100 to 150 m) of the discharge, where cuttings accumulations are greatest. Discharges and drill cuttings could impact fish by displacing them from the affected area. Because of the limited discharges no water quality impacts are anticipated that would negatively affect habitat for Cook Inlet marine mammals.

NMFS has established critical habitat for both the western distinct population segment of Steller sea lions and Cook Inlet beluga whales (described in section 3.1.1 of this Draft EA). The proposed exploratory drilling program would not occur in locations designated as critical habitat for Steller sea lions, so there would be no effect. The closest significant patch of Cook Inlet beluga whale critical habitat is located approximately 27 miles north of the proposed drill site. Another small patch of beluga whale critical

habitat is located approximately 25 miles south of the proposed drill site. The drill site does not occur in any critical habitat. Therefore, no effects are anticipated. Bluecrest would implement several measures to prevent an oil spill, including the use of a blowout preventer and the implementation of an approved Oil Discharge Prevention and Contingency Plan. Because of the very low likelihood of an oil spill, marine mammal habitat is not anticipated to be impacted.

4.1.2. Impacts to Marine Mammals

We expect that Bluecrest's proposed exploratory drilling program has the potential to take six species of marine mammals by Level B harassment, as defined by the MMPA. Acoustic stimuli generated by the drill rig, impact hammer, and airgun array may affect marine mammals in one or more of the following ways: tolerance, masking of natural sounds, behavioral disturbance, and temporary or permanent hearing impairment, or non-auditory physical effects (Richardson et al., 1995a). Our notice of proposed Authorization and Bluecrest's application provide detailed descriptions of the potential effects of exploratory drilling operations on marine mammals. That information is incorporated herein by reference and summarized next.

Numerous studies have shown that underwater sounds from industry activities are often readily detectable by marine mammals in the water at distances of many kilometers. Numerous studies have also shown that marine mammals at distances more than a few kilometers away often show no apparent response to industry activities of various types (Miller et al., 2005; Bain and Williams, 2006). This is often true even in cases when the sounds must be readily audible to the animals based on measured received levels and the hearing sensitivity of that mammal group. Although various baleen whales, toothed whales, and (less frequently) pinnipeds have been shown to react behaviorally to underwater sound such as airgun pulses or vessels under some conditions, at other times mammals of all three types have shown no overt reactions (e.g., Malme et al., 1986; Richardson et al., 1995a,b; Madsen and Mohl, 2000; Croll et al., 2001; Jacobs and Terhune, 2002; Madsen et al., 2002; Miller et al., 2005).

Masking is the obscuring of sounds of interest by other sounds, often at similar frequencies. Marine mammals are highly dependent on sound, and their ability to recognize sound signals amid other noise is important in communication, predator and prey detection, and, in the case of toothed whales, echolocation. Although some degree of masking is inevitable when high levels of manmade broadband sounds are introduced into the sea, marine mammals have evolved systems and behavior that function to reduce the impacts of masking. Structured signals, such as the echolocation click sequences of small toothed whales, may be readily detected even in the presence of strong background noise because their frequency content and temporal features usually differ strongly from those of the background noise (Au and Moore, 1988, 1990). The components of background noise that are similar in frequency to the sound signal in question primarily determine the degree of masking of that signal.

Masking effects of underwater sounds from Bluecrest's proposed activities on marine mammal calls and other natural sounds are expected to be limited. For example, porpoises and killer whales primarily use high-frequency sounds to communicate and locate prey; therefore, masking by low-frequency sounds associated with survey activities is not expected to occur (Gales, 1982). There is evidence of other marine mammal species continuing to call in the presence of industrial activity. Annual acoustical monitoring near BP's Northstar production facility during the fall bowhead migration westward through the Beaufort Sea has recorded thousands of calls each year (for examples, see Richardson et al., 2007; Aerts and Richardson, 2008). Construction, maintenance, and operational activities have been occurring from this

facility for over 10 years. To compensate and reduce masking, some mysticetes may alter the frequencies of their communication sounds (Richardson et al., 1995a; Parks et al., 2007).

The sounds generated by the proposed equipment for the exploratory drilling program will consist of low frequency sources (most under 500 Hz). Lower frequency man-made sounds are more likely to affect detection of communication calls and other potentially important natural sounds such as surf and prey noise. There is little concern regarding masking near the jack-up rig during exploratory drilling operations, as the species most likely to be found in the vicinity are mid- to high-frequency cetaceans or pinnipeds with low-frequency cetaceans occurring less frequently. Additionally, masking is not expected to be a concern from airgun usage due to the brief duration of use (less than a day to up to 2 days with sound generation occurring intermittently during that time) and the low-frequency sounds that are produced by the airguns. Therefore, masking effects are anticipated to be limited, especially in the case of odontocetes, given that they typically communicate at frequencies higher than those of the equipment.

Marine mammals may behaviorally react to sound when exposed to anthropogenic noise. These behavioral reactions are often shown as: changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where noise sources are located; and/or flight responses (e.g., pinnipeds flushing into water from haul-outs or rookeries). The onset of behavioral disturbance from anthropogenic noise depends on both external factors (characteristics of noise sources and their paths) and the receiving animals (hearing, motivation, experience, demography) and is also difficult to predict (Richardson et al. 1995a; Southall et al. 2007).

Table 4 outlines our current acoustic thresholds for estimating marine mammal harassment, and Table 5 outlines the various radii for the main sound sources proposed for use during Bluecrest’s exploratory drilling program. Based on the small isopleths from the drill rig and the minimal time the airgun array and impact hammer would be used, impacts to marine mammals are expected to be minor.

Table 4. Current acoustic exposure criteria used by NMFS.

Criterion	Criterion Definition	Threshold
Level A Harassment (Injury)	Permanent Threshold Shift (PTS) (Any level above that which is known to cause TTS)	180 dB re 1 microPa-m (cetaceans) / 190 dB re 1 microPa-m (pinnipeds) root mean square (rms)
Level B Harassment	Behavioral Disruption (for impulse noises)	160 dB re 1 microPa-m (rms)
Level B Harassment	Behavioral Disruption (for continuous, noise)	120 dB re 1 microPa-m (rms)

Table 5. Measured acoustic radii for the primary sound sources proposed for use during Bluecrest’s exploratory drilling program.

	190 dB radius	180 dB radius	160 dB radius	120 dB radius
Impact hammer during conductor pipe driving	60 m (200 ft)	250 m (820 ft)	1.6 km (1 mi)	NA
Airguns during VSP	120 m (394 ft)	240 m (787 ft)	2.5 km (1.55 mi)	NA
Rig tow	NA	NA	NA	600 m (2,000 ft)
Deep well pumps on the jack-up rig	NA	NA	NA	260 m (853 ft)

NA=Not applicable

In sum, we interpret these effects on all marine mammals as falling within the MMPA definition of Level B (behavioral) harassment. We expect these impacts to be minor because we do not anticipate measurable changes to the population or impacts to rookeries, mating grounds, and other areas of similar significance. Moreover, impacts to marine mammal hearing are not anticipated because some of the sources do not emit sounds at levels though to cause auditory threshold shifts in marine mammals or because of the small zones of the sources that do emit sounds at those levels and the incorporation of mitigation measures.

Under the Preferred Alternative, we would authorize incidental take, by Level B harassment only, of six species of marine mammals. Based on our best professional judgment and our evaluation of all of the available data, we expect no long-term or substantial adverse effects on marine mammals, their habitats, or their role in the environment.

Bluecrest proposed a number of monitoring and mitigation measures for marine mammals, and we proposed some additional measures, as part of our evaluation for the Preferred Alternative. In consideration of the potential effects of the proposed exploratory drilling program, we determined that the mitigation and monitoring measures described in section 2.3.1 of this EA would be appropriate for the Preferred Alternative to meet the Purpose and Need.

Injury: Bluecrest did not request authorization to take marine mammals by injury (Level A harassment), serious injury, or mortality. Based on the results of our analyses, Bluecrest’s environmental analyses, and previous monitoring reports for the same activities, there is no evidence that Bluecrest’s planned activities could result in injury, serious injury, or mortality within the action area. The mitigation and monitoring measures described in section 2.3.1 of this EA would minimize any potential risk for marine mammals.

Vessel Strikes: The potential for striking marine mammals is a concern with vessel traffic. Studies have associated ship speed with the probability of a ship strike resulting in an injury or mortality of an animal. However, it is highly unlikely that Bluecrest would strike a marine mammal. While under tow, the rig and tow vessels move at slow speeds (2-4 knots). The support barges supplying pipe to the drill rig can typically run at 7-8 knots but may move slower inside Cook Inlet. Moreover, mitigation measures would be required of Bluecrest to reduce speed if whales or Steller sea lions are sighted within 2,000 ft of rig towing operations.

Estimated Take of Marine Mammals by Level B Incidental Harassment: Bluecrest has requested take by Level B harassment as a result of the acoustic stimuli generated by their proposed exploratory drilling

program. We expect that the drilling program would cause short-term behavioral disturbance for marine mammals in the proposed drilling area.

As mentioned previously, we estimate that the activities associated with the proposed exploratory drilling program could potentially affect, by Level B harassment only, six species of marine mammals under our jurisdiction. For each species, these estimates are small numbers (less than one percent for each species, except minke whales for which estimated takes are 4.1-6.2 percent) relative to the population sizes. Table 6 outlines the number of Level B harassment takes that we propose to authorize in this Authorization, the regional population estimates for marine mammals in the action area, the percentage of each population or stock that may be taken as a result of Bluecrest’s activities, and the population trends.

Our proposed Authorization notice contains a complete description of how these take estimates were derived. A short summary is provided here. In their application, Bluecrest provided estimates for harbor seals and harbor porpoises by multiplying the expected species densities by the anticipated area to be ensonified by the 120 dB re 1 μ Pa (rms) SPL (rig tow and deep-well pumps) and 160 dB re 1 μ Pa (rms) SPL (VSP airgun operations and impact hammering). NMFS then included duration factors for the rig tow (2 days), drilling operations (90 days), impact hammering (3 days), and VSP airgun operations (2 days). These calculations provided take estimates of 24 harbor seals and 3 harbor porpoises. Bluecrest also included very low take estimates for the other four marine mammal species for which density information is not currently available. However, marine mammal sightings data conducted during the 2013 Cosmopolitan State #A-1 drilling program noted observations of 104 harbor porpoise, 72 harbor seals, 32 minke whales, 19 Dall’s porpoise, 12 gray whales, and two killer whales between May and August (112 days of monitoring). Of those sightings, 12 harbor porpoises and 18 harbor seals were sighted within the applicable Level B isopleths. Three minke whales were recorded within 984 ft (300 m) of the active drill rig. None of the gray whales, Dall’s porpoises, or killer whales were seen within the Level B isopleths. Therefore, we increased the take estimates from what was requested by Bluecrest, taking into consideration typical group sizes for each species, the potential for attraction to the drilling operations activities, and the 2013 sightings data. We do not expect the proposed exploratory drilling activities to impact rates of recruitment or survival for any affected species or stock. Further, the activities would not adversely affect marine mammal habitat.

Table 6. Density estimates (where available), proposed Level B harassment take levels, species or stock abundance, and percentage of population proposed to be taken during Bluecrest’s exploratory drilling program.

Species	Density (#/km ²)	Proposed Level B Take	Abundance	Percentage of Population	Trend
Harbor Seal	0.278	100	22,900	0.4	Stable
Harbor Porpoise	0.013	150	25,987	0.6	No reliable information
Killer Whale	NA	5	1,123 (resident) 552 (transient)	0.45 0.91	Resident stock possibly increasing Transient stock stable
Gray whale	NA	20	18,017	0.1	Stable/increasing
Minke whale	NA	50	810-1,233	4.1-6.2	No reliable information
Dall’s porpoise	NA	40	83,400	0.05	No reliable information

4.1.3. Impacts on Subsistence

Under Alternative 1 (the Preferred Alternative), Bluecrest's proposed exploratory drilling program in lower Cook Inlet is expected to have none to minor (temporary) effects on subsistence wildlife and marine mammals in the area. Sound from drilling operations activities might temporarily displace wildlife from the area, but animals are expected to return to the area following the cessation of use of sound sources during drilling program activities.

Marine mammals could be behaviorally harassed and either become more difficult to hunt or temporarily abandon traditional hunting grounds. If a large or very large oil spill occurred, it could impact subsistence species. However, as previously mentioned one is not anticipated to occur, and measures have been taken to prevent a large or very large oil spill. Oil spill trajectory scenarios developed in preparation of the Oil Discharge Prevention Contingency Plan indicate that potential spills would travel south through the central channel of Cook Inlet, away from shoreline subsistence harvest areas. The proposed exploratory drilling program should not have any impacts to beluga harvests as none currently occur in Cook Inlet, and no takes of belugas are anticipated or proposed to be authorized. Additionally, subsistence harvests of other marine mammal species are limited in Cook Inlet and typically occur in months when the proposed exploratory drilling program would not operate or only for very short periods of time late in the proposed drilling season.

The mitigation measures described in Section 2.3.1 of this EA would reduce even further any potential interaction with harbor seal or other subsistence hunts in lower Cook Inlet. Bluecrest concluded, and NMFS agrees, that the size of the affected area, mitigation measures, and the low levels of marine mammal subsistence hunting in the vicinity should result in the proposed action having no unmitigable adverse impact on the availability of marine mammals for subsistence uses.

NMFS anticipates that any effects from Bluecrest's proposed exploratory drilling program on marine mammals, especially harbor seals and Cook Inlet beluga whales, which are or have been taken for subsistence uses, would be short-term, site specific, and limited to inconsequential changes in behavior and mild stress responses. NMFS does not anticipate that the authorized taking of affected species or stocks would reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (1) Causing the marine mammals to abandon or avoid hunting areas; (2) directly displacing subsistence users; or (3) placing physical barriers between the marine mammals and the subsistence hunters; and that cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met. Therefore, impacts to subsistence are anticipated to be inconsequential.

4.2. Effects of Alternative 2 – No Action Alternative

Under the No Action Alternative, we would not issue an Authorization to Bluecrest. As a result, Bluecrest would not receive an exemption from the MMPA prohibitions against the take of marine mammals and would be in violation of the MMPA if take of marine mammals occurs.

The impacts to elements of the human environment resulting from the No Action Alternative—conducting the exploratory drilling program in the absence of required protective measures for marine mammals under the MMPA—would be greater than those impacts resulting from Alternative 1, the Preferred Alternative.

4.2.1. Impacts to Marine Mammal Habitat

Under the No Action Alternative, the survey would have no additive effects on the physical environment beyond those resulting from Bluecrest's exploratory drilling activities, which we evaluated in our notice of proposed Authorization and Bluecrest's application. This Alternative would result in similar effects on the physical environment as Alternative 1 (see Section 4.1.1). In summary, there would be temporary bottom disturbance to a small portion of lower Cook Inlet, and impacts to prey species would be minimal. Additional information can be found in Section 4.1.1 of this EA.

4.2.2. Impacts to Marine Mammals

Under the No Action Alternative, Bluecrest's activities would likely result in increased amounts of Level B harassment to marine mammals and possibly takes by injury (Level A harassment), serious injury, or mortality—specifically related to acoustic stimuli—due to the absence of mitigation and monitoring measures required under the Authorization. While it is difficult to provide an exact number of takes that might occur under the No Action Alternative, the numbers would be expected to be larger than those presented in Table 6 above because Bluecrest would not be required to shutdown activities when marine mammals entered various isopleths or to operate aircraft above altitudes for which we do not assume take to occur. Additionally, takes of marine mammals for which take is not proposed to be authorized in Alternative 1 would also be higher. Under Alternative 1, Bluecrest would be required to cease activities prior to beluga whales, Steller sea lions, and other marine mammals other than the six listed in Table 6 entering the applicable Level B harassment isopleths to avoid take completely. Under the No Action Alternative, Bluecrest would not be required to abide by any such measure. This would potentially lead to impacts to and take of marine mammal species not considered here. However, reactions of beluga whales, Steller sea lions, and other marine mammal species (such as humpback whales) would likely react in similar manners to those discussed in Section 4.1.2 of this Draft EA with alterations in behavioral patterns.

If the activities proceeded without the protective measures and reporting requirements required by a final Authorization under the MMPA, the direct, indirect, or cumulative effects on the human or natural environment of not issuing the Authorization would include the following:

- Marine mammals within the drilling area could experience injury (Level A harassment) and potentially serious injury or mortality. The lack of mitigation measures required in the Authorization could lead to not ramping up or powering or shutting down airguns or impact hammering when marine mammals are within applicable injury harassment zones;
- Increases in the number of behavioral responses and frequency of changes in animal distribution because of the lack of mitigation measures required in the Authorization. Thus, the incidental take of marine mammals would likely occur at higher levels than we have already identified and evaluated in our *Federal Register* notice on the proposed Authorization;
- Take of marine mammals other than the six species considered in Alternative 1 could potentially occur because measures to eliminate take of those species would not be required; and
- We would not be able to obtain the monitoring and reporting data needed to assess the anticipated impact of the activity upon the species or stock; and increased knowledge of the species as required under the MMPA.

4.2.3. Impacts to Subsistence

Under the No Action Alternative, the survey would have no additive effects on subsistence beyond those resulting from Bluecrest's activities, which we evaluated in the referenced documents. Subsistence hunting of Cook Inlet beluga whales is not allowed at this time, and subsistence hunts of other marine mammal species is limited, as described earlier in this EA. The only potential difference in impacts is that Bluecrest would not be required to ensure availability of marine mammals for subsistence uses and would not be required to implement mitigation measures to that effect.

4.3. Compliance with Necessary Laws – Necessary Federal Permits

We have determined that the issuance of an Authorization is consistent with the applicable requirements of the MMPA, ESA, MSFMCA, and our regulations. Please refer to Section 1.4 of this Draft EA for more information.

4.4. Unavoidable Adverse Impacts

Bluecrest's application, our notice of a proposed Authorization, and other environmental analyses identified previously summarize unavoidable adverse impacts to marine mammals or the populations to which they belong or on their habitats, as well as subsistence uses of marine mammals, occurring in the exploratory drilling program area. We incorporate those documents by reference.

We acknowledge that the incidental take authorized would potentially result in unavoidable adverse impacts. However, we do not expect Bluecrest's activities to have adverse consequences on the viability of marine mammals in Cook Inlet or on the availability of marine mammals for subsistence uses, and we do not expect the marine mammal populations in that area to experience reductions in reproduction, numbers, or distribution that might appreciably reduce their likelihood of surviving and recovering in the wild. We expect that the numbers of individuals of all species taken by harassment would be small (relative to species or stock abundance), that the exploratory drilling program and the take resulting from exploratory drilling program activities would have a negligible impact on the affected species or stocks of marine mammals, and that there would not be an unmitigable adverse impact to subsistence uses of marine mammals in Cook Inlet.

4.5. Cumulative Effects

NEPA defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

The Cook Inlet region is a major population center in the State of Alaska and supports a wide range of activities. The proposed exploratory drilling program would add another, albeit temporary, industrial activity to lower Cook Inlet. The proposed drilling program would be limited to a small area of the lower Inlet for a relatively short period of time, and there would be no objects permanently released into the water column. This section provides a brief summary of the human-related activities affecting the marine mammal species in the action area.

4.5.1. Subsistence Hunting

In Cook Inlet, Native hunters historically have hunted beluga whales and harbor seals for food. The subsistence harvest of beluga transcends nutritional and economic value of the whale as the harvest is an integral part of the cultural identity of the region's Alaska Native communities. Inedible parts of the whale provide Native artisans with materials for cultural handicrafts, and the hunting perpetuates Native traditions by transmitting traditional skills and knowledge to younger generations. However, due to dramatic declines in the Cook Inlet beluga whale population, on May 21, 1999, legislation was passed to temporarily prohibit (until October 1, 2000) the taking of Cook Inlet belugas under the subsistence harvest exemption in section 101(b) of the MMPA without a cooperative agreement between NMFS and the affected Alaska Native Organizations (Public Law No. 106-31, section 3022, 113 Stat. 57,100). That prohibition was extended indefinitely on December 21, 2000 (Public Law No. 106-553, section 1(a)(2), 114 Stat. 2762). NMFS subsequently entered into six annual co-management agreements (2000-2003, 2005-2006) with the Cook Inlet Marine Mammal Council, an Alaska Native Organization representing Cook Inlet beluga hunters, which allowed for the harvest of 1-2 belugas. On October 15, 2008, NMFS published a final rule that established long-term harvest limits on the Cook Inlet beluga whales that may be taken by Alaska Natives for subsistence purposes (73 FR 60976). That rule prohibits harvest for a five-year period (2008-2012), if the average abundance for the Cook Inlet beluga whales from the prior five years (2003-2007) is below 350 whales. The next five-year period that could allow for a harvest (2013-2017), would require the previous five-year average (2008-2012) to be above 350 whales. Additional information on the Cook Inlet beluga harvest can be found in NMFS (2008).

4.5.2. Pollution

As the population in urban areas continues to grow, an increase in the amount of pollutants that enter Cook Inlet is likely to occur. Sources of pollutants in urban areas include runoff from streets and discharge from wastewater treatment facilities. Gas, oil, and coastal zone development projects (e.g., the Chuitna Coal Mine) also contribute to pollutants that enter Cook Inlet through discharge. Gas, oil, and coastal zone development will continue to take place in Cook Inlet; therefore, it would be expected that pollutants could increase in Cook Inlet. However, the EPA and the Alaska Department of Environmental Conservation will continue to regulate the amount of pollutants that enter Cook Inlet from point and non-point sources through NPDES permits. As a result, permittees will be required to renew their permits, verify they meet permit standards and potentially upgrade facilities. Additionally, the extreme tides and strong currents in Cook Inlet may contribute in reducing the amount of pollutants found in the Inlet.

4.5.3. Fisheries Interaction

Fishing is a major industry in Alaska. As long as fish stocks are sustainable, subsistence, personal use, recreational and commercial fishing will continue to take place in Cook Inlet. As a result there will be continued prey competition, risk of ship strikes, potential harassment, potential for entanglement in fishing gear and potential displacement from important foraging habitat for the Cook Inlet beluga whales and other marine mammal species. NMFS and the Alaska Department of Fish and Game will continue to manage fish stocks and monitor and regulate fishing in Cook Inlet to maintain sustainable stocks.

4.5.4. Vessel Traffic

Major contributors to vessel traffic throughout Cook Inlet include port facilities, oil and gas development, and commercial and recreational fishing. The Port of Anchorage (POA) is a major Alaskan port located

adjacent to Anchorage in upper Cook Inlet (more than 100 miles north of the proposed Cosmopolitan drill site). While the POA is outside the action area considered in this Draft EA, the POA yields a high volume of vessels traffic that must pass through or near the action area described in this Draft EA. The POA provides 90 percent of the consumer goods for 85 percent of the state of Alaska. The POA handles the majority of Alaska's refined petroleum products and the bulk of jet fuel for Joint Base Elmendorf-Richardson and the Ted Stevens Anchorage International Airport (100 and 60 percent respectively; POA, 2014). Major vessels calling to the POA include cargo ships, barges, tankers, dredgers, military ships and tug boats (POA, 2009). Based on data from 1998-2011, an average of approximately 450 vessels call to the POA annually (POA, 2014). The POA is currently under construction and expanding its facilities. As a result, vessel traffic will increase once the project is complete.

Port MacKenzie is located in upper Cook Inlet outside of the action area described in this Draft EA; however, it also contributes to vessel traffic that passes through or near the EA action area. It receives about two large ships annually (i.e. a landing craft and/or a barge), which is substantially less than the POA. However, the number of ships calling to port at Port MacKenzie is expected to increase over the next five years; the Rail Extension and expanding the currently existing deep draft dock are planned for construction. Smaller port facilities that contribute to vessel traffic in the action area include Nikiski, the City of Kenai, Kasilof, Ninilchik, Anchor River, Tyonek and Drift River. Vessels ranging from tankers to fishing boats call to these ports (Kenai Peninsula Borough, 2003). Gas and oil development also contribute to vessel traffic in the action area, as well as commercial and recreational fishing vessels.

4.5.5. Gas and Oil Development

Currently, there are several gas and oil development projects in the proposed action area, and it is likely that future gas and oil development will continue to take place in the action area. Apache Alaska Corporation (Apache) conducted seismic surveys in the Inlet in 2012 and 2014 and recently submitted an application for a five-year MMPA Authorization for the take of marine mammals incidental to seismic surveys in Cook Inlet for the period of March 2015 through February 2020. A low number of Level B takes occurred during the 2012 and 2014 Apache seismic surveys; however, take levels were within those analyzed. Additionally, we have received Authorization applications from other oil and gas companies requesting takes of marine mammals incidental to seismic surveys and drilling operations, including two requests to conduct seismic survey programs very similar to those conducted by Apache in 2012 and 2014 with some spatial overlap and also temporal overlap. The Department of the Interior's Bureau of Ocean Energy Management proposed one lease sale in Cook Inlet in its 2012-2017 Five-Year Outer Continental Shelf Oil and Gas Lease Plan (BOEM, 2013). Depending on the level of interest during the lease sale, this could lead to an increase in seismic surveying and future oil exploration in the next several years.

Impacts from gas and oil development include increased noise from seismic activity, vessel and air traffic and well drilling; discharge of wastewater; habitat loss from the construction of oil and gas facilities; and contaminated food sources and/or injury from a natural gas blowout or oil spill. The risk of these impacts may increase as oil and gas development increases; however, new development will undergo consultation and permitting requirements prior to exploration and development. If Authorizations are issued to these other applicants, they would be required to implement mitigation and monitoring measures to reduce impacts to marine mammals and their habitat in the area and would be subject to the MMPA and ESA standards.

Support vessels are required for gas and oil development to transport supplies and products to and from the facilities. Not only will the support vessels from increased gas and oil development likely increase noise in the action area, there is a potential for a slightly increased risk of ship strikes with marine mammals; however, ship strikes have not been definitively confirmed in a Cook Inlet beluga whale or other Cook Inlet marine mammal deaths, and monitoring measures should reduce this risk by placing visual monitors on the drill rig to look out for marine mammals.

4.5.6. Coastal Zone Development

Coastal zone development may result in the loss of habitat, increased vessel traffic, increased pollutants and increased noise associated with construction and noise associated with the activities of the projects after construction. In the action area, two main projects are being considered, the Chuitna Coal Mine and the Ocean Renewable Power Company (ORPC) Tidal Energy Project.

Chuitna Coal Project

PacRim Coal, LP is proposing to develop, construct and operate a coal mine and export facility 19 km (12 mi) northwest of the Village of Tyonek, which is well north of the proposed Cosmopolitan State #B-1 drill site. Potential impacts to marine mammals in upper Cook Inlet from the Chuitna Coal Project would include the construction of the coal export facility and surface water discharge. The coal export facility that includes an overland coal conveyer and ship loading berth would extend from shore into Cook Inlet. The conveyer and ship berth would incorporate tower sites approximately 335 m (1,100 ft) apart to allow for uninhibited movement of marine life (PacRim Coal, LP, 2011). No chemical or water-based processing of the coal would take place; therefore, the expected sources of discharge from the project would include rainfall, snowmelt and groundwater (PacRim Coal, LP, 2011). Prior to discharging water into Cook Inlet, the water would be directed to sediment control structures and meet the water quality criteria described by the APDES permit (PacRim Coal, LP 2011).

ORPC Alaska Tidal Energy Projects

The ORPC is proposing two tidal energy projects in Cook Inlet. The first tidal energy project would be located on the Westside of Fire Island near Anchorage, and the second project would be located adjacent to the East Foreland in the vicinity of Nikiski on the Kenai Peninsula (ORPC, 2011), both of which are relatively near the proposed Cosmopolitan State #B-1 drill site. The tidal energy projects would require the installation of an array of turbine generator units and transmission cables on the seafloor to harness the tidal energy. The tidal energy will be converted to electrical energy at stations on land. These projects are still in preliminary testing and environmental monitoring phases (ORPC, 2011).

4.5.7. Marine Mammal Research

Because many important aspects of marine mammal biology remain unknown, or are incompletely studied, and because management of these species and stocks requires knowledge of their distribution, abundance, migration, population, ecology, physiology, genetics, behavior, and health, free-ranging marine mammal species are frequently targeted for scientific research and studies. Research activities normally include close approach by vessel and aircraft for line-transect surveys; behavioral observation; photo-identification and photo-video-grammetry; passive acoustic recording; attachment of scientific instruments (tagging), both by implantable and suction cup tags; biopsy sampling, including skin and blubber biopsy and swabbing; land-based surveys; live capture for health assessments, and blood and tissue sampling, pinniped tooth extraction, and related pinniped anesthesia procedures. All researchers

are required to obtain a scientific research permit from NMFS Office of Protected Resources under the MMPA and/or ESA (if an ESA-listed species is involved). Currently, the permits authorizing research on beluga whales in Cook Inlet, as well as permits authorizing research on harbor seals, harbor porpoises, Steller sea lions, and killer whales in Alaskan waters may have cumulative effects on these species and stocks. NMFS anticipates that scientific research on marine mammals in Cook Inlet will continue, and possibly expand, due to the increasing need to better understand distribution and abundance relative to temporal (seasonal, diel, or tidal) and spatial (geographic or bathymetric) parameters.

4.5.8. Climate Change

The 2007 Intergovernmental Panel on Climate Change (IPCC) concluded that there is very strong evidence for global warming and associated weather changes and that humans have “very likely” contributed to the problem through burning fossil fuels and adding other “greenhouse gases” to the atmosphere (IPCC, 2007). This study involved numerous models to predict changes in temperature, sea level, ice pack dynamics, and other parameters under a variety of future conditions, including different scenarios for how human populations respond to the implications of the study.

Evidence of climate change in the past few decades, commonly referred to as global warming, has accumulated from a variety of geophysical, biological, oceanographic, and atmospheric sources. The scientific evidence indicates that average air, land, and sea temperatures are increasing at an accelerating rate. Although climate changes have been documented over large areas of the world, the changes are not uniform and affect different areas in different ways and intensities. Arctic regions have experienced some of the largest changes, with major implications for the marine environment as well as for coastal communities. Recent assessments of climate change, conducted by international teams of scientists (Gitay et al., 2002 for the Intergovernmental Panel on Climate Change; (IPCC) Arctic Climate Impact Assessment, 2004; IPCC, 2007), have reached several conclusions of consequence for this EA:

- Average arctic temperatures increased at almost twice the global average rate in the last 100 years.
- Satellite data since 1978 show that perennial arctic sea ice extent has shrunk by 2.7 percent per decade, with larger decreases in sea ice extent in summer of 7.4 percent per decade.
- Arctic sea ice thickness has declined by about 40 percent during the late summer and early autumn in the last three decades of the 20th century.

Marine mammals are classified as sentinel species because they are good indicators of environmental change. Arctic marine mammals are ideal indicator species for climate change, due to their circumpolar distribution and close association with ice formation. NMFS recognizes that warming of the Arctic, which results in the diminishing of ice, could be a cause for concern to marine mammals. In Cook Inlet, marine mammal distribution is dependent upon ice formation and prey availability, among other factors. For example, belugas often travel just along the ice pack and feed on prey beneath it (Richardson et al., 1990, 1991). Any loss of ice could result in prey distribution changes or loss; however, beluga whales do not use ice for resting, reproduction, or rearing of young like pinnipeds.

It is not clear how governments and individuals will respond or how much of these future efforts will reduce greenhouse gas emissions. Although the intensity of climate changes will depend on how quickly and deeply humanity responds, the models predict that the climate changes observed in the past 30 years

will continue at the same or increasing rates for at least 20 years. Although NMFS recognizes that climate change is a concern for the sustainability of the entire ecosystem in Cook Inlet, it is unclear at this time the full extent to which climate change will affect marine mammal species.

4.5.9. Conclusion

Based on the summation of activity in the area provided in this section, NMFS believes that the incremental impact of an Authorization for the proposed Bluecrest exploratory drilling program in Cook Inlet would not be expected to result in a cumulative significant impact to the human environment from past, present, and future activities. The potential impacts to marine mammals, their habitats, and the human environment in general are expected to be minimal based on the limited and temporary noise footprint and mitigation and monitoring requirements of the Authorization.

Chapter 5 List of Preparers and Agencies Consulted

Agencies Consulted

No other persons or agencies were consulted in preparation of this EA.

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