

Endangered Species Act – Section 7 Consultation Biological Opinion

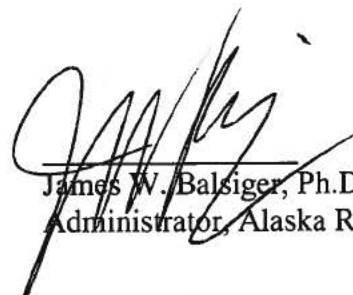
Activity Considered: Issuance of regulations and letters of authorization under the Marine Mammal Protection Act to authorize incidental take of marine mammals by U.S. citizens engaged in space vehicle and missile launch operations at the Kodiak Launch Complex on Kodiak Island, Alaska

Action Agency: National Marine Fisheries Service

Consultation
Conducted By: National Marine Fisheries Service,
Alaska Region

Date Issued:

Issued by:



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1. INTRODUCTION

This introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background and Consultation History

The biological opinion (opinion) and incidental take statement portions of this document were prepared by the National Marine Fisheries Service, Alaska Region (NMFS AKR) in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402.

The opinion is in compliance with section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-5444) (“Data Quality Act”) and underwent pre-dissemination review.

The Kodiak Launch Complex (KLC) was originally licensed by the Federal Aviation Administration in 1998. On July 26, 2001, NMFS received an application from the Alaska Aerospace Corporation (AAC) under section 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA) for authorization to take, by harassment, Steller sea lions (*Eumetopias jubatus*) and harbor seals (*Phoca vitulina*) incidental to rocket launches from KLC on Kodiak Island, Alaska. Since 1998, AAC has provided monitoring reports to U.S. Federal Aviation Administration (FAA) and NMFS related to noise and marine mammal impacts associated with ongoing rocket launches from KLC. After reviewing the information contained in the monitoring reports, NMFS then decided that a more current environmental analysis was necessary. In 2005, NMFS prepared an Environmental Assessment (EA) on the *Promulgation of Regulations Authorizing Take of Marine Mammals Incidental to Rocket Launches at Kodiak Launch Complex, Alaska, and the Issuance of Subsequent Letters of Authorization*. The analysis contained within the EA specifically addressed the impacts launches would have on Steller sea lions and harbor seals on nearby Ugak Island. NMFS found that the promulgation of a 5-year Rule and issuance of Letters of Authorization (LOA) would not significantly impact the quality of the human environment and issued a Finding of No Significant Impact (FONSI) on December 22, 2005. Accordingly, preparation of an Environmental Impact Statement or Supplemental Environmental Impact Statement for that action was not necessary.

There have been several past section 7 consultations by NMFS AKR regarding the KLC. These resulted in our determination that the facility would not likely jeopardize the continued existence of the endangered Steller sea lion or adversely modify its critical habitat. Monitoring was specified to ensure that launch noise would not harass Steller sea lions on a nearby haul-out, or that other listed species were not taken. Data from two KLC launches did not definitively establish that noise from the rocket launch harassed Steller sea lions.

The operator of the KLC, AAC has reapplied for authorization for the harassment taking of marine mammals under the MMPA (75 FR 80775, 23 December 2010). This authorization would permit the unintentional and incidental taking of small numbers of marine mammals due to the operation

of the KLC. Because the western population of Steller sea lions is also listed as an endangered species, those takings must also be authorized under the ESA. Incidental takes of endangered species which are associated with a Federal action (i.e., NMFS's issuing regulations and subsequent LOAs) are authorized through the issuance of an Incidental Take Statement (ITS), prepared by NMFS AKR, and an accompanying biological opinion, which concludes that the action as authorized will not jeopardize the continued existence of the endangered species or result in the destruction or adverse modification of its designated critical habitat.

It was therefore necessary for NMFS Permits, Conservation, and Education Division (PR1), to request formal consultation on its promulgation of incidental take regulations and issuance of LOAs to authorize KLC operations to take Steller sea lions by harassment, and for NMFS AKR to prepare the required opinion and ITS.

On November 10, 2010, NMFS AKR received a letter from PR1 requesting formal consultation on the issuance of incidental take regulations and LOAs. The scope of the action AAC has presented in its current MMPA authorization application is not significantly different than that analyzed in NMFS' 2005 EA:

- 1) AAC proposes to launch the same or similar type space vehicles and missiles as those assessed in the 2005 EA. Although new space vehicles may be used during future launches, none would be larger or louder than currently used vehicles.
- 2) Currently, AAC is to conduct no more than three launches per year within the season when Steller sea lions may occupy the haul-out on Ugak Island (15 June-30 September). AAC's present request is for a total of 45 launches within the 5-year period, an average of nine per year, with a maximum of 12 launches in a single year. Although PR1 and AAC do not propose to continue the current seasonal restrictions, the number of launches that may occur during these dates would not significantly increase. AAC estimates that no more than one launch could occur during a 4-week period, so at most AAC could conduct four launches during the season when Steller sea lions may occupy Ugak Island.
- 3) AAC will improve monitoring protocols by installing a camera system that will use live feed to monitor the Steller sea lion haul-out site during rocket launches instead of aerial surveys that are weather dependent in an area where harsh weather conditions often made it difficult to access the haul-out sites.

This opinion is based upon the best available science, including information from the following documents: AAC's 5-year programmatic permit application for small takes of marine mammals (2010), proposed rule (75 FR 80775, 23 December 2010), final rule (71 FR 4297, January 26, 2006), and NMFS EA on the *Promulgation of Regulations Authorizing Take of Marine Mammals Incidental to Rocket Launches at Kodiak Launch Complex, Alaska, and the Issuance of Subsequent Letters of Authorization* (2005). A complete record of the consultation is on file at the offices of NMFS AKR.

NMFS has prepared this biological opinion to reflect the current and proposed operation of the facility and to address impacts to the Steller sea lion which may be present in the action area during launch operations. The objective of this biological opinion is to determine whether the action is

likely to jeopardize the continued existence of the Steller sea lion, or result in the destruction or adverse modification of its critical habitat.

1.2 Proposed Action

“Action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

The proposed action by PR1 is to issue 5-year regulations and subsequent LOAs under section 101 (a)(5) of the MMPA to AAC to incidentally take the endangered Steller sea lions during operations of a commercial rocket launch facility. The new regulations would be effective from March 18, 2011 through March 17, 2016. Launch activities could occur at any time of day or night and in any weather during the period to be covered under this rulemaking. Under the proposed action, the KLC may launch up to 45 vehicles during the five year period, or an average of nine vehicles annually, by both government and private users. Detailed descriptions of the complex and launch operations are provided in several documents, including PR1 Environmental Assessment (NMFS 2005) on the *Promulgation of Regulations Authorizing Take of Marine Mammals Incidental to Rocket Launches at Kodiak Launch Complex, Alaska, and the Issuance of Subsequent Letters of Authorization* and the proposed rule (75 FR 80775, 23 December 2010)

The number of launches of space launch vehicles and ballistic target vehicles from KLC is variable. Launch planning is a dynamic process, and launch delays, which can last from hours to more than a year, can and do occur. Launch delays occur due to variables ranging from technical issues to adverse weather. These factors have controlling influence over the vehicle numbers by class that are actually launched in any given year from KLC. Launches take place year round when all variables affecting launch decisions are in correct alignment.

AAC estimates the total number of vehicles that might be launched from KLC during the course of the 5-year period covered by the requested rulemaking has increased to 45 vehicles, with an average of nine per year. AAC estimates that of the 45 estimated launches from KLC during the 5-year period in consideration:

- 32 launches will be the small space launch and target vehicles of the Castor 120 or smaller size and modeling shows this rocket is about eight miles above the earth’s surface when it overflies Ugak Island. The sonic boom reaches earth between 21 to 35 miles down range, which is past the Outer Continental Shelf break and over the North Pacific abyss (USFAA 1996). Sound pressure from the Castor 120 at the traditional haul-out on Ugak Island was measured to be 101.4 dBA (SEL). This location is 3.5 miles away from the launch pad. None of the vehicles expected to be flown from KLC during the 5-year period covered by this rule making and associated permit is known to be louder than the Castor 120.
- 10 launches will be the tactical missiles or smaller size and sound pressures from these smaller systems are not available, but will be substantially less than those from Castor 120 (101.4 dBA (SEL)) and pose no potential for disturbance to marine mammals.

- Three launches will be the medium class launch vehicle and the anticipated sound pressure at the traditional Steller sea lion haul-out at Ugak Island is likely to be at or somewhat less than the 101.4 dBA (SEL) recorded for the Castor 120.

While it is difficult to estimate, the highest number of launches in any given year might be 12 events, if smaller tactical systems were flown for test and evaluation purposes. This is a high end number that represents the worst case scenario for analysis.

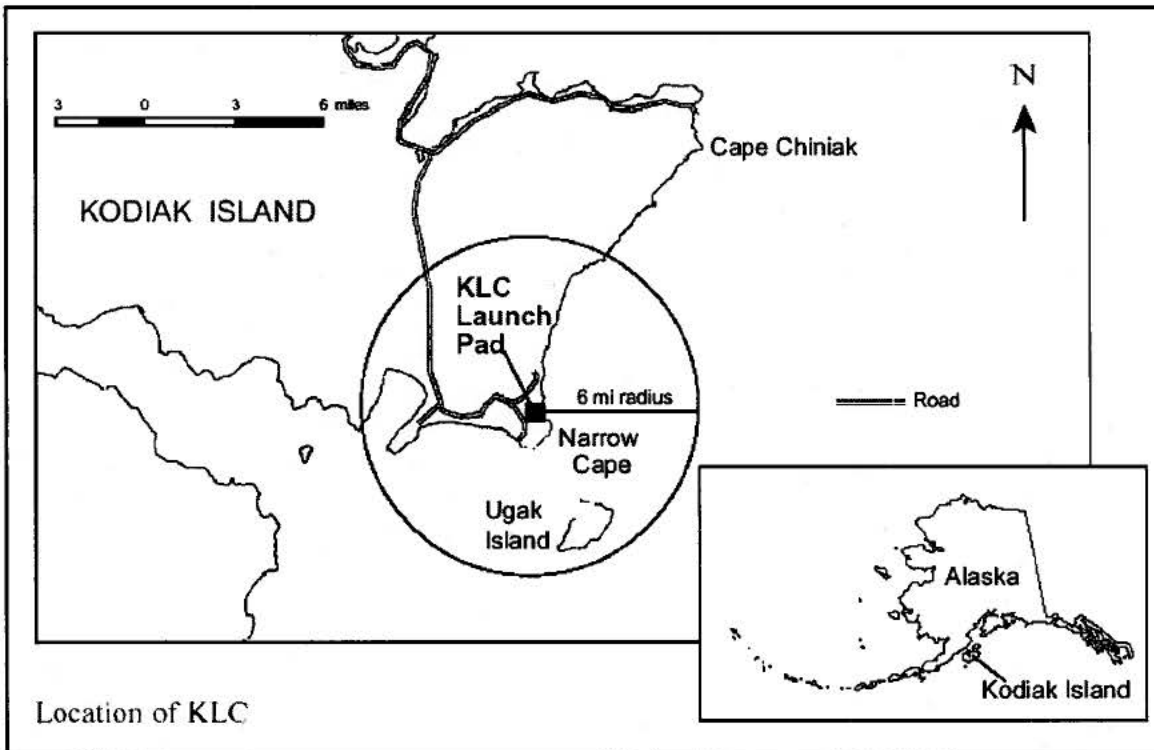
To minimize impacts to Steller sea lion haul-out sites, the AAC has proposed, as part of their specified activities, the following mitigation measures: 1) security over-flights immediately associated with the launch would not approach the occupied Steller sea lion haul-out on Ugak Island by closer than 0.25 mile (0.4 km), and would maintain a vertical distance of 1,000 ft (305 m) from the haul-outs when within 0.5 miles (0.8 km), unless indications of human presence or activity warrant closer inspection of the area to assure that national security interests are protected in accordance with law; 2) if launch monitoring or quarterly aerial surveys indicate that the distribution, size, or productivity of the potentially affected Steller sea lion population has been affected due to the specified activity, the launch procedures and the monitoring methods would be reviewed, in cooperation with NMFS, and, if necessary, appropriate changes may be made through modifications to a given LOA, prior to conducting the next launch of the same vehicle under that LOA.

1.3 Proposed Action Area

The action area is defined by NMFS' regulations (50 CFR 402.02) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

The area considered to be affected by the facility and its operations was set in a September 1996 meeting involving AAC and its environmental consultant (University of Alaska Anchorage, Environment and Natural Resources Institute), and government agencies represented by FAA, NMFS, U.S. Fish and Wildlife Service (FWS), and Alaska Department of Environmental Conservation. Attendees at that meeting reviewed information on the known effects of rocket operations on the environment and set the expected impact area to be within a six mile radius of the launch pad area (Figure 1). There are no federally listed terrestrial threatened or endangered species within this six mile radius area; however, there are several federally listed marine mammals present in the waters offshore and on haul-outs on Ugak Island, which lies about 3.5 miles distance from the launch pad area.

Figure 1. KLC Vicinity Map.



KLC launch azimuths range from 110 degrees to 220 degrees. The eastern most launch azimuth of 110 degrees is within a few degrees of most orbital launches, and crosses the extreme eastern edge of Ugak Island where pinniped haul-outs are found. Modeling done of Castor 120, the loudest vehicle, space launches indicates the vehicle is passing through 45,000 feet altitude by the time it reaches the island about seventy seconds post launch (USFAA 1996). Spent first stage rocket motors impact the ocean from 11 to more than 300 miles down range, depending on launch vehicle. Sonic booms reach the earth's surface beyond the Outer Continental Shelf, which ends about 20 miles offshore, where it plunges precipitously to the North Pacific abyss (USFAA 1996).

KLC is about 22 air miles from the City of Kodiak, which is the largest settlement on the Kodiak Island. Land elevations at KLC range from about 140 feet near the pad complex to about 300 feet at the Launch Control Center. The AAC has authority to restrict public access for safety purposes to land abutting KLC's northern and western boundaries, as well as to all of Ugak Island, which lies immediately south of Narrow Cape. Ugak Island's axis trends northeast to southwest. The island is about two miles long by about one mile wide. The land slopes steeply upward from a spit on the island's northern most point, which is a traditionally used Steller Sea Lion haul-out, to the southwest, culminating in cliffs that are approximately 1,000 feet in elevation. These cliffs run the entire length of the island's long axis. Eastward, the narrow Outer Continental Shelf ends about 20 miles offshore, where it plunges precipitously to the North Pacific abyss. Near shore water depths to the immediate south and west of the island range to several hundred feet.

The action area is the actual launch facilities within the KLC, and waters in and adjacent to Narrow Cape, which are along the vehicle launch trajectories from the facility, and the adjacent shorelines.

2. ENDANGERED SPECIES ACT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the FWS, NMFS, or both, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Section 7(b)(3) requires that at the conclusion of consultation, the Service provide an opinion stating how the agencies' actions will affect listed species or their critical habitat. If incidental take is expected, Section 7(b)(4) requires the provision of an incidental take statement (ITS) specifying the impact of any incidental taking, and including reasonable and prudent measures to minimize such impacts.

2.1 Biological Opinion

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The jeopardy analysis considers both survival and recovery of the species. The adverse modification analysis considers the impacts to the conservation value of the designated critical habitat.

“To jeopardize the continued existence of a listed species” means to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

This biological opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.¹

NMFS AKR must determine whether the action is likely to jeopardize the listed species, or result in the destruction or adverse modification of designated critical habitat. This analysis involves the initial steps of defining the biological requirements of the listed species, and evaluating the relevance of the environmental baseline to the species' current status.

2.1.1 Status of the Species and Critical Habitat

Four endangered species may occur within the action area: Steller sea lions from the western Distinct Population Segment (DPS), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), and North Pacific right whale (*Eubalaena japonica*). The Steller sea

¹ Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (Application of the “Destruction or Adverse Modification” Standard Under Section 7(a)(2) of the Endangered Species Act) (November 7, 2005).

lion is always around Kodiak Island, while the fin whale and humpback whale are seasonally-abundant, but may occur during all months of the year. The North Pacific right whale, with a population estimate at 31 whales (Wade et al. 2010), is rarely observed around Kodiak Island. Although the humpback whale can be found in waters near Ugak Bay during summer months, the fin whale is rarely observed, while the North Pacific right whale has not been observed there.

NMFS AKR has determined that all endangered whale species are not likely to be adversely affected by launch operations because they are not in the area (fin whale and Northern right whale) or would be below the surface of the water, and therefore not likely to be exposed to launch noise (humpback whale) that would significantly disrupt normal behavioral patterns. Airborne noise is generally reflected at the sea surface outside of a 26 degree cone extending downward from an airborne source (Richardson et al. 1995), directly below the launch vehicle. Submerged animals would normally have to be directly under the noise sources before they may hear it. Underwater acoustic transmissions are complex, and affected by the level and frequency of the noise, sea state, other surface conditions, water depth, and sea floor conditions. The launch sounds that would penetrate beneath the sea surface would not persist in the water for more than a few seconds. Given the recorded in-air noise levels from past launches (e.g. 80 to 101 dB re: 20 μ Pa.), it is unlikely that underwater noise would reach levels that would affect fin whales, humpback whales, and/or North Pacific right whales: 1) behaviorally (under the MMPA, NMFS considers the threshold for Level B harassment for baleen whales to be received sound levels that exceed 160 dB re: 1 μ Pa; the in-air equivalent would be approximately 98 dB re: 1 μ Pa.) or 2) injuriously (under the MMPA, NMFS considers the threshold for Level A harassment for baleen whales to be received sound levels that exceed 180 dB re: 1 μ Pa.; the in-air equivalent to this level would be approximately 116 dB re: 20 μ Pa.). Additionally, underwater noise propagation is limited by frequency, with higher frequencies having greater attenuation. Noise signals in water normally decrease exponentially with distance. NMFS also realizes that other in-water and air-borne noise sources (boats and planes) exist in waters surrounding Narrow Strait.

Based on the best available scientific information, NMFS AKR has determined that the action being considered in the opinion may adversely affect the endangered western DPS of the Steller sea lion and designated critical habitat for Steller sea lions. Individual Steller sea lions may be adversely affected by this project mostly due to noise and visual stimuli associated with launches. Detailed information about the Steller sea lion status and biology may be found in several documents, including those found on the NMFS AKR website at: <http://www.fakr.noaa.gov/>.

The Steller sea lion is described by two DPSs: the western stock (those animals born on rookeries west of 144 degrees West longitude) listed as an endangered species, and the eastern stock (those animals born on rookeries east of 144 degrees West longitude) listed as a threatened species. Sea lions present in the action area are assumed to be from the endangered western stock.

References to original literature are made throughout this section to identify scientific sources and guide readers to further information. However, much of the following information in this section is derived from the biological opinion NMFS recently prepared to evaluate the effects of

authorizing federal groundfish fisheries in the Gulf of Alaska and Bering Sea and Aleutian Islands (NMFS 2010).

In the 1950s, the worldwide abundance of Steller sea lions was estimated at 240,000 to 300,000 animals, with a range that stretched across the Pacific Rim from southern California, Canada, Alaska, and into Russia and northern Japan. In the 1980s, annual rates of decline in the range of what is now recognized as the western DPS were as high as 15 percent per year. By 1990, the U.S. portion of the population had declined by about 80 percent. On November 26, 1990, NMFS issued a final rule (55 FR 49204) to list Steller sea lions as a threatened species under the ESA. After listing, the rate of decline decreased to about 5 percent per year.

NMFS subsequently reclassified Steller sea lions as two DPSs under the ESA. The western DPS that extends from Japan around the Pacific Rim to Cape Suckling in Alaska (144°W) was listed as endangered due to its continuous decline and lack of recovery. This endangered listing was supported by population viability analysis (PVA), which indicated that a continued decline at the 1985-1994 rate would result in extinction of the western DPS in 100 years or a 65 percent chance of extinction if the 1989-1994 trend continued for 100 years (62 FR 24354).

NMFS has also designated critical habitat for the Steller sea lion (58 FR 45269). The areas designated as critical habitat for the Steller sea lion were determined using the best scientific and commercial information available (see regulations at 50 CFR Part 226.202). Particular attention was paid to life history patterns and the areas where animals haul-out to rest, pup, nurse their pups, mate, and molt. In the final rule designating critical habitat (58 FR 45269), NMFS stated that essential habitat for Steller sea lions includes terrestrial, air, and aquatic areas, and that physical and biological features within this habitat that support reproduction, foraging, rest, and refuge are essential to the conservation of this species.

Designated critical habitat for Steller sea lions west of 144° W longitude includes specified major haul-outs and rookeries and 1) a terrestrial zone that extends 3,000 ft (0.9 km) landward from the baseline or base point of each major rookery and major haul-out, 2) an air zone that extends 3,000 ft (0.9 km) above the terrestrial zone, measured vertically from sea level, 3) an aquatic zone that extends 20 nm (37 km) seaward in State and Federally managed waters from the baseline or base-point of each major rookery and major haul-out in Alaska and 4) three special aquatic foraging areas in Alaska: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

Steller sea lions require both terrestrial and aquatic resources for survival in the wild. Land sites used by Steller sea lions are referred to as rookeries and haul-outs. Haul-outs can be used by all size and gender classes, but are generally not sites of reproductive activity. The continued use of particular sites may be due to site fidelity, or the tendency for Steller sea lions to return repeatedly to the same site, which is often the site of their birth. Presumably, the haul-out sites were chosen by Steller sea lions because of their substrate and terrain, the protection they offer from terrestrial and marine predators, protection from severe climate or sea surface conditions, and the availability of prey resources.

Two kinds of marine foraging habitat were designated as critical: 1) areas immediately around rookeries and haul-outs, and 2) three aquatic foraging areas where large concentrations of important prey species were known to occur (Shelikof Strait, southeastern Bering Sea, and Seguam area).

Areas around haul-out sites are important for juveniles, because most juveniles are found at haul-outs not rookeries. Young animals are almost certainly less efficient foragers and may have relatively greater food requirements, which suggests that they may be more easily limited or affected by reduced prey resources or greater energetic requirements associated with foraging at distant locations. Therefore, the areas around haul-out sites must contain essential prey resources for juveniles, and those areas were deemed essential to protect.

2.1.2 Environmental Baseline

The “environmental baseline” includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

This section incorporates the relevant description of the environmental baseline in the biological opinion NMFS recently prepared in connection with its authorization of the federal groundfish fisheries in the Gulf of Alaska and Bering Sea and Aleutian Islands (NMFS 2010, sections 4.1-4.7). The reader should consult this source for a detailed description of the environmental baseline. The following briefly summarizes the environmental baseline as described therein and supplements it as appropriate for this action.

Presently, the western stock of the Steller sea lions, which includes those found in the Kodiak Island area, is estimated to total around 41,000 animals (Allen and Angliss 2010). The area inhabited by the western DPS is a fished ecosystem, from which large quantities of certain target species have been harvested since the 1960s, initially by foreign fisheries and by 1989, entirely domestic fisheries. The count of Steller sea lions in the western DPS in the Kenai to Kiska census area was more than 100,000 animals (non-pups) by the end of the 1950s, and about 90,000 animals by the end of the 1970s. Then a marked decline commenced with about 22,000 non-pups counted in this census area by 1990, and 15,000 non-pups counted by 2000. About 17,000 animals were counted as of 2008 in the Kenai to Kiska census area, the last survey date for non-pup animals. Because sea lion populations respond similarly within portions of their range and at finer scales than previously considered, the Alaskan western DPS were divided into 11 Rookery Cluster Areas (RCAs) (1-10 from west to east) (NMFS 2010). In RCA 9, essentially the eastern portion of the central Gulf of Alaska survey subarea (including Kodiak Island area), observed non-pup counts declined about six percent per year through the 1990s, and were stable from 2000 through 2008.

RCAs 8 and 9, essentially the central Gulf of Alaska, are characterized by a continental shelf and groundfish prey biomass of intermediate magnitudes compared to Areas 1-5 (smaller) and Areas 6-7 (larger). The Steller sea lion diet is relatively diverse in these areas, and the chief groundfish

prey species are pollock, salmon, Pacific cod, and arrowtooth flounder. A high proportion of the total catch for pollock and Pacific cod is caught in winter and within Steller sea lion critical habitat. Steller sea lion numbers have stabilized during the last 20 years, but have shown only slight increases in the 2000s in these RCAs, suggesting that fishery measures may have provided for limited recovery. High catch amounts for both pollock and Pacific cod within critical habitat during winter in RCAs 8 and 9, an intermediate Steller sea lion foraging environment, possibly resulted in chronic long-term nutritional stress that adversely affected reproduction, but probably not survival, resulting in the current population stability but lack of recovery.

Several critical habitat sites exist within the Gulf of Alaska and three occur along the southeastern shoreline of Kodiak Island: Cape Chiniak, Gull Point, and Ugak Island. Cape Chiniak and Gull Point are approximately 15 and 10 miles from the KLC, respectively, and the terrestrial portions of these areas would not be affected by launch operations as the expected impact area is within a six mile radius of the launch pad area. Ugak Island is located 3.5 miles from the launch pad complex and this critical habitat includes a 20 nm marine area. A Steller sea lion haul-out exists on a sand spit along the north eastern shoreline of Ugak Island. NMFS identified rest and refuge as two important habitat functions performed by haul-outs that were designated as critical habitat. In addition, NMFS identified the local prey availability in the marine area surrounding a haul-out as an important factor that affects sea lions' use of such habitat (NMFS 2010). NMFS recently evaluated the effect of federally authorized commercial fisheries on the conservation function of marine areas designated as Steller sea lion critical habitat, including those around Kodiak, and that discussion is incorporated by reference herein (NMFS 2010, section 7.5). NMFS does not expect this action to adversely affect the conservation function of Steller sea lion marine critical habitat. Therefore, the remainder of the discussion focuses on terrestrial habitat.

During breeding season, abundance estimates on Ugak Island was collected 18 times since 1957. On 13 surveys, Steller sea lions were not observed on Ugak Island (1989-1991, 1996-1998, 2000, 2002, 2004, and 2007-2010); while sea lions were observed in 1997 (318 animals), 1985 (17 animals), 1986 (270 animals), 1992 (four animals), and 1994 (one animal) (Fritz and Stinchcomb 2005, NMFS unpublished data). During non-breeding season, surveys were flown over Ugak Island in March 1993, 1994, 1997, and 1999; and December 1994 (NMFS unpublished data). Only during December 1994 were Steller sea lions observed (20 animals) (NMFS unpublished data). The survey data shows that use by Steller sea lions on Ugak Island is not consistent during the summer, as compared to other sites on eastern Kodiak Island; and during the off-season, what little information is available on Steller sea lions and Ugak Island, is also not consistent. More recent observations during launch-related environmental monitoring (2006-2008) within a six-mile radius study area identified 0-8 sea lions on Ugak Island.

These reduced counts are in line with the counts from other long-term trend count sites in the Kodiak Archipelago during the same time period (75 FR 80775, 23 December 2010). The low count data is supported by anecdotal reports from KLC staff (AAC 2010). Other long-term trend sites around Kodiak Island are removed from the six mile radius surrounding the KLC, in which impacts from the launch are anticipated to occur; and therefore these haul-out areas would not have been disturbed by launch noise. The Steller sea lion haul-out at Cape Chiniak has been surveyed 19

times since 1957 and Gull Point was surveyed 18 times since 1976. Although the Steller sea lion abundance estimates have declined at Cape Chiniak from 873 animals (1985) to 87 animals (2004) and at Gull Point from 281 animals (1985) to 40 animals (1996), the haul-outs were consistently used except when 0 animals were recorded in 1989 (Cape Chiniak); and 1986 and 1989 (Gull Point).

at the recently observed declines in Steller sea lions' use of Ugak Island is in keeping with general declines seen in the western DPS as a whole (AAC 2010, NMFs unpublished data). Because observed Steller sea lion abundance has declined throughout the region, not just the area affected by launches, NMFS AKR believes it is likely that any observed decline in the use of the Ugak Island haul-out is not attributable to the localized effect from past launches; rather, any decline in the use of the Ugak haul-out is likely due to the same factors that have affected the western stock throughout the region.

2.1.3 Analysis of Effects

2.1.3.1 Effects of the Proposed Action

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

This analysis evaluates the effects of the action during a 5-year period of time, which coincides with the 5-year duration of the incidental take regulations. As discussed below, the rocket launches associated with this action may disturb Steller sea lions. Based on observation data and the loudest measured sound pressure level recorded on Ugak Island (approximately 101.4 dBA), NMFS anticipates that if Steller sea lions are disturbed, they may begin to return to haul-out sites on Ugak Island within 2 to 55 minutes of the launch disturbance (75 FR 80773, December 23, 2010). As stated below, we do not expect this action to result in any discernible impacts to Steller sea lions that would persist beyond the 5-year duration of the incidental take regulations.

The Steller sea lion haul-out on Ugak Island, which is designated as critical habitat for this species, presents the opportunity for disturbance or harassment during launches. This site is 3.5 miles from the launch pad and, if sea lions are hauled out on the shoreline during a launch, they may be exposed to airborne noise and visual stimuli from the launch.

Launch operations are a major source of noise on Kodiak Island, as the operation of launch vehicle engines produce substantial sound pressures. Generally, launch related noise consists of: 1) combustion noise, 2) jet noise from interaction of combustion exhaust gases with the atmosphere, and 3) sonic booms. The latter noise, sonic booms, are not an issue with wildlife at KLC as modeling predicts that sonic booms created by ascending rockets launched from KLC reach the Earth's surface over deep ocean, well past the edge of the Outer Continental Shelf, which ends about 20 miles offshore, and well beyond Steller sea lion critical habitat. Launch azimuths to orbit from KLC pass over the extreme northeastern tip of Ugak Island, located about 3.5 miles

away from the launch pad area, at which location a rocket lifting to orbit will be nearing hypersonic velocities and be at an altitude of approximately eight miles above the Earth's surface. Spent first stage motors from space lift missions (i.e., those going to orbit) fall to Earth over the deep ocean beyond the edge of the Outer Continental Shelf (USFAA 1996).

There are other factors associated with the KLC which could impact Steller sea lions. These have been considered, but are not likely to adversely affect these animals for several reasons. The expendable solid rocket boosters from launch vehicles normally separate at very high altitudes, and spent rocket motors fall into the sea away from any sea lion habitat. Catastrophic failures are known to occur, but the combined probability of such an event and contact of an aborted launch vehicle with sea lions or their habitat would be very remote.

NMFS AKR recommended monitoring of the first five launches from the KLC to determine whether noise and other stimuli caused by launch activities would result in behavioral disturbance to sea lions and other marine mammals. Additionally, monitoring was to provide more detail on the seasonal occurrence of marine mammals in this region of Kodiak Island, as well as the noise signature of individual launch vehicles at this location. Through this work and past surveys, we now know that the Ugak Island Steller sea lion haul-out is seasonally occupied, largely between the months of June and September. Acoustic monitoring of several launches has shown received sound levels (RSL) at this haul-out may reach 101 dB re 20 μ Pa, but are not expected to exceed this level. RSLs are highly variable and depend on the launch vehicle (several different solid-fuel rockets may be launched from KLC), ambient noise levels, launch azimuth, and distance from the rocket engine. Behavioral reactions among hauled-out Steller sea lions could be anticipated at levels above 100 dB re 20 μ Pa, although this would depend largely on ambient noise levels as well as the behavior of the animals themselves. Unfortunately, remote behavioral observations of sea lion reactions to launch noise have not produced any definitive information that might allow a predictive model of RSL's and behavioral reaction. However, monitoring data suggest a likelihood that Steller sea lions present on Ugak Island at the time of a launch may be harassed due to noise and/or visual stimuli. Prior to the September 1999 launch from the KLC, 60 to 80 Steller sea lions were observed on the Ugak Island haul-out. A monitoring flight approximately one hour after this launch found the site abandoned, with sea lions swimming immediately offshore. While this provides evidence of disturbance and flight reactions due to launches, it was also noted that Steller sea lions were observed to stampede off this haul-out several hours prior to launch without any obvious stimuli, and that at other times sea lions on this site showed little reaction to transient noises from aircraft approaches or the presence of researchers (AADC 2001). The site appeared to be completely re-occupied by the following morning. Disturbances of this kind, occurring infrequently and unaccompanied by protracted harassment on the beach, are not known to cause abandonment of favored hauling areas, and usually the animals return to their previous hauling patterns within a day, as observed here (Bowles 2000).

The biological observations described above are consistent with the literature and applicable research regarding pinniped hearing and acoustic disturbance. In-air hearing deteriorates rapidly below 2 kHz, and pinnipeds appear to be considerably less sensitive to airborne sounds below 10

KHz than are humans (Richardson et al. 1995). Most of the acoustic energy associated with rocket launches of the type used at KLC falls below 2 kHz (AADC 2001).

Additionally, rocket launches from KLC will be infrequent, transient events characterized by an extremely rapid departure at a near-vertical trajectory. Typically, the launch vehicle will have attained an altitude of nearly eight miles before crossing above the Ugak Island haul-out (70 seconds after launch). Therefore, visually, the rocket launch effects on Steller sea lions on Ugak Island are limited, because they are of short duration and the vehicle would appear relatively small when it has reached an altitude of eight miles. The Castor 120 is the loudest launch vehicle motor expected to be launched from KLC during the 5-year period covered by the requested permit. Sound pressure from the Castor 120 at the traditional haul-out on Ugak Island (3.5 miles away from the launch pad) was measured to be 101.4 dBA (SEL) (ACC 2010). Such levels are likely to cause disturbance to Steller sea lions (e.g. greater than 100 dBA). However, acoustically, we expect most received noise levels at Ugak Island to be below these levels because all launch vehicles, but the largest and loudest Castor 120, will be somewhat less than or substantially less than the Castor 120 (75 FR 80775, 23 December 2010). When loud noises occur, their very short duration also would have some mitigating effect on the level of disturbance. Data for one California sea lion suggest an in-air hearing threshold of around 77 dB (re: 20 mPa) at 100 Hz. If hearing abilities of Steller sea lions are similar, then most of the launch noise that was recorded would have been audible to sea lions that may seasonally haul-out at Ugak Island; however, hearing impairment of sea lions exposed to this short duration noise event would not be likely (Stewart 1998). It is most likely the launch noise would trigger an alert (heads up) behavior and/or flush sea lions into the adjacent waters. NMFS anticipates that should Steller sea lions leave Ugak Island, they may begin to return to haul-out sites on Ugak Island within 2 to 55 minutes of the launch disturbance (75 FR 80773, December 23, 2010). These infrequent disturbances are unlikely to cause sea lions to abandon the Ugak Island site. Ugak Island is also exposed to disturbances from aircraft and fishing vessels transiting Narrow Strait. Although Steller sea lion breeding season is in May through June, Ugak Island haul-out is only used by non-breeding males and juveniles; therefore, the breeding segment of the population would be unaffected.

NMFS AKR anticipates that the action covered by this biological opinion is reasonably certain to result in the incidental take resulting from the disturbance and displacement of ESA listed Steller sea lions due to launch operations. Based on the best scientific and commercial data available, NMFS AKR expects this to be low level, non-lethal takes (Level B harassment). The Ugak Island haul-out is occupied for approximately four months each year, by up to eight Steller sea lions, and no more than four launches could occur during that time. NMFS AKR anticipates non-lethal incidental take of up to 32 individuals per year (eight animals per launch x four launches).

2.1.3.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of “future State or private activities, not involving federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation.” Future Federal actions that are unrelated to the proposed action are reviewed through separate section 7 consultation processes. Therefore, such actions are not considered cumulative to the proposed action.

Cumulative effects to Steller sea lions may result from the 1) subsistence harvest by Alaska Natives, 2) state-managed commercial and sport fisheries, and 3) climate change. Other than these, NMFS AKR is not aware of any specific future non-Federal activities within the action area. NMFS AKR assumes that future private and state actions will continue at similar intensities as in recent years.

Subsistence Harvest by Alaska Natives

Steller sea lions harvested by Alaska Natives result in direct lethal takes, and we expect subsistence harvest of these animals to continue into the foreseeable future. The western stock of sea lion harvest in 2008 by Alaska Natives were split among four main regions: Aleutian Islands (48 sea lions, or 33.1 percent of the total statewide take of Steller sea lions), Pribilof Islands (36 sea lions, or 24.7 percent of the total statewide take of Steller sea lions), North Pacific Rim (25 sea lions, or 16.8 percent of the total statewide take of Steller sea lions), and Kodiak Island (19 sea lions, or 12.9 percent of the total statewide take of Steller sea lions) (Wolfe et al. 2009). Kodiak City, about 22 air miles from KLC, is the closest community that could hunt Steller sea lions on Kodiak Island. However, no Steller sea lions were harvested from Kodiak City in 2008 (Wolfe et al. 2009b), 2007 (Wolfe et al. 2009a), and 2006-2003 (Wolfe et al. 2008); with a harvest of 1-3 Steller sea lions from 1994-2002 (Wolfe et al. 2008).

The overall future impact of the subsistence harvest on the western population will be determined by the number of animals taken, their gender, age class, and the location where they are harvested. As with other mortality sources, the significance of subsistence harvests to the western DPS may increase, especially in certain areas such as the western or central Aleutian Islands, if Steller sea lion abundance continues to decline. Future subsistence harvests may contribute to localized declines of Steller sea lions and/or impede recovery, if the harvest is concentrated geographically. However, it is expected that subsistence harvest from Kodiak City, nearest Ugak Island, will remain low and insignificant.

State-Managed Commercial and Sport Fisheries

With regard to direct effects, state managed commercial fisheries are likely to continue to account for an annual mortality for Steller sea lions; although it should be recognized that the data used to estimate direct mortality are almost twenty years old and are based on a relatively small sample. Observers monitored salmon drift gillnet and salmon set gillnet in Prince William Sound (1990-1991), Alaska Peninsula/Aleutian Islands (1990), Cook Inlet (1999-2000), and Kodiak Island (2002). Only the Prince William Sound salmon drift gillnet fishery recorded two mortalities in 1991, which were extrapolated to 29 dead sea lions (95 percent, CI = 1-108 animals) (Allen and Angliss 2010).

As another source of mortality data, observers also monitored the Alaska sport (non-commercial) salmon troll fisheries (1993-2005) and fisheries using miscellaneous fishing gear (2001-2005). NMFS stranding database has only a couple reports on Steller sea lions entangled in fishing gear or with injuries caused by interactions with gear (Allen and Angliss 2010). During the 5-year period from 2001 to 2005, there was only one confirmed fishery-related Steller sea lion stranding from

the western stock. This sighting involved an animal in Bristol Bay (Round Island) with netting or rope around its neck (Allen and Angliss 2010). In addition, a Steller sea lion was reported as entangled in a large flasher/spoon in 1998. It is likely this injury occurred as a result of a sport fishery, as there are sport fisheries for both salmon and shark in this area and there is no way to distinguish between them since both fisheries use a similar type of gear (Allen and Angliss 2010). However, it is understood that fishery interaction reports are considered a minimum estimate because not all entangled animals strand and not all stranded animals are found or reported.

Regarding indirect effects, NMFS concludes based on available information that State managed fisheries for pollock, Pacific cod, herring, and salmon are likely to continue to compete for fish with foraging Steller sea lions. Given the importance of near shore habitats to Steller sea lions, this competition for fish may have consequential effects (NMFS 2010). Specifically, these interactions may contribute to nutritional stress for Steller sea lions and may reduce the value of the marine portions of designated Steller sea lion critical habitat (NMFS 2010). The closure of State waters off the eastern side of Kodiak to non-pelagic trawl gear may mitigate these effects on animals in the vicinity of KLC to some extent. Nonetheless, State managed fisheries will likely continue to reduce prey availability within these marine foraging areas and may alter the distribution of certain prey resources in ways that reduce the foraging effectiveness of Steller sea lions (NMFS 2010).

Sport fisheries in Alaska are generally managed by the Alaska Department of Fish and Game and result in the harvest of several species, with salmon and halibut the most predominant harvested species. We expect that sport fisheries have an incremental effect on listed Steller sea lions relative to that in commercial fisheries. In 1998, Alaska's sport fishery harvests about 1 percent (4,000 mt) of the annual State of Alaska total fish harvests, while the commercial fisheries accounted for 97 percent (900,000 mt) of the annual harvest (NMFS 2010). Impacts are likely limited to minor removals of the potential foraging base, but in such small volumes, we expect only incremental adverse effects, if any.

Global Climate Change

There is growing concern about global climate change. Global air and ocean temperatures during this century are warming and evidence suggests that the productivity of the North Pacific is affected by changes in the environment (Quinn and Niebauer 1995, Mackas et al. 1998).

Increases in global temperatures are expected to have profound impacts on arctic and sub-arctic ecosystems, and some of these impacts have been documented during the last several decades. Specifically, 1) winter temperatures in Alaska and western Canada have increased as much as 3-4 °C during the past half century, 2) precipitation, mostly in the form of rain, has increased primarily in winter resulting in faster snowmelt, 3) sea ice extent has decreased about 8 percent during the past 30 years, with a loss of 15-20 percent of the late-summer ice coverage in the arctic, and 4) glacial retreat, particularly in Alaska, has accelerated contributing to sea level rise (ACIA 2004). These impacts, and others, are projected to accelerate during this century.

The effects of these changes to the marine ecosystems of the Bering Sea, Aleutian Islands, and the Gulf of Alaska, and how they may specifically affect western Steller sea lions are uncertain. Warmer waters could favor productivity of certain forage fish species, but the impact on recruitment dynamics of important fish to Steller sea lions is unpredictable. Recruitment of large year-classes of gadids (e.g., pollock) and herring has occurred more often in warm than cool years, while the distribution (with respect to foraging Steller sea lions) and recruitment of other fish (e.g., osmerids) could be negatively affected. Whether these patterns will continue as overall temperatures increase is uncertain, as are the effects on the duration and strength of atmospheric and oceanographic regimes (Trenburth and Hurrell 1994, Hare and Mantua 2000).

As temperatures warm and global ice coverage decreases, sea levels will rise. This will directly affect terrestrial rookery and haul-out sites currently used by Steller sea lions as well as those that may be used by a recovering population. Presumably, Steller sea lions that use terrestrial sites will simply move upslope as sea levels rise, assuming that the terrain at the site is suitable. However, sites on some islands with low relief (e.g., Aleutian Island: Agligadak Island) may be submerged. The net effect of a rise in sea level on overall terrestrial Steller sea lion habitat amount or availability is uncertain, but at the projected rate it is unlikely to have a significant effect for many years.

2.1.3.3 Integration and Synthesis

Pursuant to Section 7(a)(2) of the ESA, Federal agencies are directed to ensure that their activities are not likely to jeopardize the continued existence of any listed endangered and threatened species or result in the destruction or adverse modification of designated critical habitat. "Jeopardize the continued existence of" is defined in regulations as to engage any action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

In this section, we assess the effects from the annual take of 32 Steller sea lions from AAC activities at KLC and integrate those effects with the environmental baseline and cumulative effects. Finally, we consider the implication of those effects on the continued existence of the Steller sea lion and the destruction or adverse modification to its critical habitat.

In particular, we examine the scientific data available to determine if an individual's probable responses to the agency's action are likely to have consequences for the individual's growth, survival, annual reproductive success, and lifetime reproductive success. When individual animals exposed to an action are expected to experience reductions in fitness, we would expect reductions in the abundance, reproduction rates, and/or growth rates (or increase the variance in these measures) of the population those individuals represent. On the other hand, when animals are *not* expected to experience reductions in fitness, we would not expect the action to have adverse consequences on the population's viability.

In determining whether individual Steller sea lions would be affected, we analyzed when, where, and how an animal would be exposed to the various noise associated with the rocket launch. In

this biological opinion, NMFS has utilized the best available scientific and commercial data to evaluate the consequences from the rocket launch activities on the endangered Steller sea lion. Despite this fact, there exist numerous data deficiencies and uncertainties that limit our ability to accurately forecast the future effects of this activity. These include biological, ecological, political, social, and economic uncertainties.

NMFS scientists have developed population viability models and extinction risk analyses that describe the population impacts from mortalities within this DPS to their survival and recovery. Those models, however, do not include a conversion factor by which harassment takes can be assessed; how many harassments would equate to a mortality event? While science has not produced an answer to this question, a reasonable impact assessment can still be arrived at, by considering the population status, current growth trends, the sea lion reactions to harassment, the consequence of that reaction to individual sea lions, and the impact of those individual reactions to the population; along with the uncertainty of the relationship between harassments and mortalities. Were we to find little likelihood of a relationship between harassment and mortality, for example, the overall impact to this DPS might be low or moderate. On the other hand, if we were to find a high likelihood that harassments are linked with some mortality, the overall impact might become significant.

Uncertainty is also considered as we manage risk. To avoid Type II errors, (i.e., concluding that an animal was not affected when in fact it was) in situations with many unknowns or uncertainties, we may assume an effect would occur, thereby providing the “benefit of the doubt” to the species. The acceptability of risk is clearly dependent on the species/habitat status in question, and a relatively low level of risk is acceptable for populations such as the western DPS of Steller sea lions.

Synthesis

The primary concern associated with the impacts of the proposed action on the western DPS for Steller sea lions has to do with potential impacts due to noise. Exposure to anthropogenic noise may affect these sea lions by impacting their hearing (temporary threshold shifts or permanent threshold shifts indicating mechanical damage to the ear structure) or affecting their behavior (harassment). Therefore, the subject of noise receives much attention in our analysis. There is still uncertainty about the potential impacts of sound on marine mammals, on the factors that determine response and effects, and especially, on the long-term cumulative consequences from increasing noise from multiple sources.

Available evidence also indicates that behavioral reaction to sound, even within a species, may depend on the listener’s gender and reproductive status, possibly age and/or accumulated hearing damage, type of activity engaged in at the time or, in some cases, group size. For example, reaction on Ugak Island to sound may vary depending on whether sea lion just arrived, or have been there for some time. Response may be influenced by whether, how often, and in what context, the individual animal has heard the sound before. All of this specificity greatly complicates our ability, in a given situation, to predict the behavioral response by a species, or on classes of individuals within a species, to a given sound. Therefore, we attempt to take a conservative approach in our analyses and base conclusions about potential impacts or potential

effects on the most sensitive members in a population.

For some Steller sea lions that respond behaviorally to the sounds associated with the rocket launches, the response could disrupt behavioral patterns such as resting or seeking refuge on a haul-out, which would amount to Level B harassment, as that term is defined in the MMPA. In order to avoid committing a Type II error, we assume that animals are harassed when their behavior appears to be disrupted, as indicated by an animal lifting its head or moving toward or into the water.

Tertiary effects, those resulting in population-level changes including increased mortality, reduced reproductive rate, or habitat abandonment, are also not well understood. A metric for the impacts of noise exposure on critical biological parameters such as growth, survival, and reproduction might improve our ability to forecast the effects of this action. Unfortunately, such information is not available at this time.

On integrating the effects from the proposed take of Steller sea lions and their critical habitat with the environmental baseline and cumulative effects, annually up to 32 individual sea lions may be harassed by noise from the action, assuming all launches involved the louder rockets (Castor 120). Some animals may exhibit minimal behavioral response, and some animals may leave the haul-out to enter the adjacent waters. Even if the action were to result in every one of these animals leaving the terrestrial haul-out to enter the water, remaining in the water for several hours and subsequently returning to the haul-out, we do not believe this project would have significant adverse consequences at the population level. Steller sea lions are unlikely to be killed or injured by this project, and harassment would be expected to be localized and of short duration. We do not anticipate such brief responses to infrequent disturbance events will adversely affect the fitness of individual animals. The most pronounced increase in noise levels would occur during the actual launch. However, annually only nine launches are planned, and AAC could practicably conduct at most four launches during the period when Steller sea lions may haul-out on Ugak Island (15 June-30 September). While Steller sea lions may be taken under the environmental baseline and through cumulative effects, we believe such takes will be non-lethal and will consist of non-injurious harassment and disturbance by noise. It is not presently possible to quantify the incremental effects of this harassment to the extinction risk probabilities for the western population of the Steller sea lion, when added to the environmental baseline and cumulative impacts. However, we believe it is unlikely that the limited number of non-injurious takes that may result from this action would have any discernible adverse consequences to the survival or reproductive capacity of the western DPS of Steller sea lions. Ugak Island is used by as a haul-out by non-breeding Steller sea lions, and when occupied, the island provides rest and refuge to these animals. When load noises occur from the KLC operations, Steller sea lions could be flushed into adjacent waters. However, the loud noises would be for a very short duration and Steller sea lions are expected to return to the haul-out within 2 to 55 minutes of the launch disturbance (75 FR 80773, December 23, 2010). This noise disturbance would be such a short time (minutes) that Ugak Island would remain a functional haul-out that Steller sea lions may use for rest and refuge. Moreover, NMFS does not expect launch noise to interfere with the ability of

the adjacent aquatic critical habitat to provide forage and refuge to Steller sea lions. Accordingly, critical habitat would not be destroyed or adversely modified by this action.

Conservation measures are included in this biological opinion, which, along with operational conditions on the proposed regulations, would further reduce the likelihood for biologically significant impacts to individual whales or this DPS.

2.1.4 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, NMFS AKR has determined that the proposed action is not likely to jeopardize the continued existence of the western stock of the Steller sea lion nor result in the destruction or adverse modification of Steller sea lion critical habitat.

NMFS AKR used the best available scientific and commercial data to analyze the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, as well as for consideration of cumulative effects. NMFS AKR believes that the proposed action may result in behavioral reactions among individual Steller sea lions that may be present on Ugak Island during launches. These reactions may include temporary departure from the site and lethal take is not expected.

Due to the limited number of launches (nine per year), the limited number of Steller sea lions takes on Ugak Island that would be caused by any single launch (estimate eight during the peak season), and the short duration of the effects (both auditory and visual) from the rockets, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of the western stock of Steller sea lions or destroy or adversely modify its critical habitat.

2.1.5 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

PR1 identified the following conservation measures, which are adopted here as conservation recommendations. While adopting these conservation measures is not a condition of the findings in this opinion (other than those that are considered part of the proposed action), these measures will lessen the effects from the project on Steller sea lions.

The following conservation recommendations would minimize adverse effects to Steller sea lions during 5-year regulations and subsequent LOAs to AAC to incidentally take Steller sea lions during operations of a commercial rocket launch facility:

1. If the launch monitoring or quarterly aerial surveys indicate the distribution, size, or productivity of the Steller sea lion population was affected due to the specified activity, the launch procedures and the monitoring methods shall be reviewed, in cooperation with NMFS, and, if necessary, appropriate changes may be made through modifications to a given LOA, prior to conducting the next launch of the same vehicle under that LOA.
2. AAC shall install an Alaska Sea Life Center designed camera system that uses live feed to monitor a given haul-out site during rocket launches.
3. The AAC shall conduct quarterly aerial surveys to determine if marine mammal abundance is changing in the long term.

2.1.6 Reinitiation of Consultation

Consultation must be reinitiated if: (1) the amount or extent of taking specified in the ITS is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). Moreover, if monitoring at the project site reveals that listed species are being stranded or delayed in their migration, consultation must be reinitiated.

2.2 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by regulation to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For purposes of this consultation, we interpret “harass” to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.² Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of an ITS.

² NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as “to trouble, torment, or confuse by continual persistent attacks, questions, etc.” The U.S. Fish and Wildlife Service defines “harass” in its regulations as

an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3).

The interpretation we adopt in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the U.S. Fish and Wildlife interpretation of the term.

Amount of take anticipated

NMFS AKR anticipates up to 32 individuals per year and a total of up to 160 individuals from the Steller sea lion western DPS could be taken as a result of this proposed action. The incidental take is expected to be in the form of non-injurious harassment. In this opinion, NMFS AKR determined that Level B harassment (non-lethal takes) of Steller sea lions at Ugak Island is reasonably likely to occur due to launch operation. The Ugak Island haul-out is occupied for approximately four months each year by up to eight Steller sea lions. No more than four launches could occur during that same time. Therefore,

Effect of the take

In this opinion, NMFS AKR determined that this level of anticipated take is not likely to jeopardize the continued existence of the western DPS of Steller sea lions and is not likely to result in the destruction or adverse modification of designated critical habitat.

Although NMFS AKR has specified the amount of take anticipated as a result of the proposed action and has evaluated the effect of such take, NMFS AKR is not including an incidental take authorization for the western DPS of Steller sea lions at this time because the incidental take of Steller sea lions has not been authorized under section 101(a)(5) of the Marine Mammal Protection Act and/or its 1994 amendments. Following issuance of such regulations and Letters of Authorization, NMFS AKR may amend this biological opinion to include an incidental take authorization for Steller sea lions, as appropriate.

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