(b) * * *

(1)The QHP issuer must comply with applicable requirements in § 155.221 of this subchapter.

* * * * *

Dated: December 14, 2018.

Seema Verma,

Administrator, Centers for Medicare & Medicaid Services.

Dated: December 18, 2018.

Alex M. Azar II,

Secretary, Department of Health and Human Services.

[FR Doc. 2019–00077 Filed 1–17–19; 4:15 pm]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 217

RIN 0648–BI44

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to U.S. Air Force Launches and Operations at Vandenberg Air Force Base, California

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: NMFS has received a request from the U.S. Air Force (USAF) for authorization to take marine mammals incidental to launching space launch vehicles, intercontinental ballistic and small missiles, and aircraft and helicopter operations at Vandenberg Air Force Base (VAFB) from March 2019 to March 2024. As required by the Marine Mammal Protection Act (MMPA), NMFS is proposing regulations to govern that take, and requests comments on the proposed regulations. NMFS will consider public comments prior to making any final decision on the issuance of the requested incidental take regulations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than February 22, 2019.

ADDRESSES: You may submit comments, identified by NOAA–NMFS–2018–0047, by any of the following methods:

- *Electronic submissions:* submit all electronic public comments via the Federal eRulemaking Portal, Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2018-0047,* click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments. Alternately, electronic comments may be emailed to *ITP.laws@noaa.gov.*
- *Mail:* Submit comments to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, or Adobe PDF file formats only.

FOR FURTHER INFORMATION CONTACT: Jordan Carduner, Office of Protected Resources, NMFS; phone: (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Availability

A copy of the USAF's application and any supporting documents, as well as a list of the references cited in this document, may be obtained online at: *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.* In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Purpose and Need for Regulatory Action

This proposed rule would establish a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) to allow for the authorization of take of marine mammals incidental to launching space launch vehicles, intercontinental ballistic and small missiles, and aircraft and helicopter operations at VAFB.

We received an application from the USAF requesting the five-year regulations and authorization to take marine mammals. Take would occur by Level B harassment incidental to launch noise and sonic booms. Please see ''Background'' below for definitions of harassment.

Legal Authority for the Proposed Action

Section 101(a)(5)(A) of the MMPA (16 U.S.C. 1371(a)(5)(A)) directs the Secretary of Commerce to allow, upon request, the incidental, but not intentional taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region for up to five years if, after notice and public comment, the agency makes certain findings and issues regulations that set forth permissible methods of taking pursuant to that activity and other means of effecting the ''least practicable adverse impact'' on the affected species or stocks and their habitat (see the discussion below in the ''Proposed Mitigation'' section), as well as monitoring and reporting requirements. Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I, provide the legal basis for issuing this proposed rule containing five-year regulations, and for any subsequent LOAs. As directed by this legal authority, this proposed rule contains mitigation, monitoring, and reporting requirements.

Summary of Major Provisions Within the Proposed Rule

Following is a summary of the major provisions of this proposed rule regarding space launch activities. These measures include:

- Required acoustic monitoring to measure the sound levels associated with the proposed activities.
- Required biological monitoring to record the presence of marine mammals during the proposed activities and to document responses to the proposed activities.
- Mitigation measures to minimize harassment of the most sensitive marine mammal species.

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined ''negligible impact'' in 50 CFR 216.103 as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

The MMPA states that the term ''take'' means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, the MMPA defines ''harassment'' as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must evaluate our proposed action (*i.e.,* the promulgation of regulations and subsequent issuance of incidental take authorization) and alternatives with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 of the Companion Manual for NAO 216–6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the proposed action qualifies to be categorically excluded from further NEPA review.

Information in the USAF's application and this proposed rule collectively provide the environmental information related to proposed issuance of these regulations and subsequent incidental take authorization for public review and comment. We will review all comments submitted in response to this proposed rule prior to concluding our NEPA process or making a final decision on the request for incidental take authorization.

Summary of Request

On August 10, 2018, NMFS received an application from the USAF, 30th Space Wing, requesting authorization for the take of six species of pinnipeds incidental to launch, aircraft, and helicopter operations from VAFB launch complexes. On December 4, 2018, NMFS received a supplement to the application from USAF that included a request to include activities associated with the recovery of Space Exploration Technologies (SpaceX) Falcon 9 First Stage rockets in VAFB's request. NMFS proposes regulations to govern the authorization of take incidental to these activities. On September 13, 2017 (83 FR 46483), we published a notice of receipt of the USAF's application in the **Federal Register**, requesting comments and information related to the request for thirty days. We received comments from the Marine Mammal Commission. The comments were considered in development of this proposed rule and are available online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.*

The take of marine mammals incidental to activities related to the launching of space launch vehicles and missiles, and aircraft and helicopter operations at VAFB, have been previously authorized by NMFS via Letters of Authorization (LOA) issued under current incidental take regulations, which are effective from March 26, 2014 through March 26, 2019 (79 FR 10016). To date, we have issued nine LOAs to USAF for these activities, under the current and prior incidental take regulations.

Description of the Specified Activity

Overview

VAFB contains 7 active missile launch facilities and 6 active space launch facilities and supports launch activities for the U.S. Air Force, Department of Defense, National Aeronautics and Space Administration, and commercial entities. It is the primary west coast launch facility for placing commercial, government and military satellites into polar orbit on unmanned launch vehicles, and for the testing and evaluation of intercontinental ballistic missiles (ICBMs) and sub-orbital target and interceptor missiles. In addition to the launching of rockets, certain rocket components are returned to VAFB for reuse, using in-air ''boost-back'' maneuvers and landings at the base. In addition to space vehicle and missile launch activities at VAFB, occasional helicopter and aircraft operations occur at VAFB that involve search-and-rescue, delivery of space vehicle components, launch mission support, security reconnaissance, and training flights. The use of unmanned aerial systems (UAS, also known as ''drones'') also occurs at VAFB.

The USAF anticipates that no more than 110 rocket launches and 15 missile launches would occur in any year during the period of authorized activities (Table 1). This number of launches would represent an increase compared to historical launch activity at VAFB, but the USAF anticipates an increase in the number of launches in the near future and has based their estimate of planned rocket launches on this anticipated increase.

There are six species of marine mammals that may be affected by the USAF's proposed activities: California sea lion, Steller sea lion, northern fur seal, Guadalupe fur seal, northern elephant seal, and harbor seal. Hauled out pinnipeds may be disturbed by launch noises and/or sonic booms (overpressure of high-energy impulsive sound) from launch vehicles. Aircraft that are noisy and/or flying at low altitudes can also have the potential to disturb hauled out pinnipeds. Pinniped responses to these stimuli have been monitored at VAFB for the past 25 years.

Dates and Duration

The activities proposed by USAF would occur for five years, from March 2019 through March 2024. Activities would occur year-round throughout the period of validity for the proposed rule.

Specified Geographical Region

All launches and aircraft activities would occur at VAFB. The areas potentially affected by noise from these activities includes VAFB and the Northern Channel Islands (NCI). VAFB occupies approximately 99,100 acres of land and approximately 42 miles of coastline in central Santa Barbara County, California and is divided by the Santa Ynez River and State Highway 246 into two distinct parts: North Base and South Base. The NCI are considered part of the project area for the purposes of this proposed rule, as rocket launches and landings at VAFB may result in sonic booms that impact the NCI. The

NCI are four islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa) located approximately 31 mi (50 km) south of Point Conception, which is located on the mainland approximately 4 mi (6.5 km) south of the southern border of VAFB. The closest part of the NCI (Harris Point on San Miguel Island) is located more than 30 nautical miles south-southeast of the nearest launch facility.

Rocket and missile launches occur from several locations on VAFB, on both North Base and South Base. Please refer to Figure 2 and Figure 3 in the USAF's application for a depiction of launch locations on VAFB. Rocket landings by SpaceX would occur at the landing area on VAFB referred to as Space Launch Complex (SLC) 4W, located on South Base, approximately 0.5 miles (mi) (0.8 kilometers (km)) inland from the Pacific Ocean. Although SLC–4W is the preferred landing location for the Falcon 9 First Stage, SpaceX has identified two contingency landing locations should it not be feasible to land the First Stage at SLC–4W. The first contingency landing location is on a barge located at least 27 nautical miles (nm) (50 km) offshore of VAFB. The second contingency landing location is on a barge within the Iridium Landing Area, an approximately 12,800 square mile (mi^2) (33,153 square kilometers (km^2)) area located approximately 122 nm (225 km) southwest of San Nicolas Island (SNI) and 133 nm (245 km) southwest of San Clemente Island.

Detailed Description of Specified Activities

As described above, the USAF has requested incidental take regulations for its operations at VAFB, which include rocket and missile launches, rocket recovery activities, and aircraft and helicopter operations. VAFB is headquarters to the 30th Space Wing, the Air Force Space Command unit that operates VAFB and the Western Range. VAFB operates as a missile test base and aerospace center, supporting west coast space launch activities for the USAF, Department of Defense, National Aeronautics and Space Administration (NASA), and commercial contractors. VAFB is the main west coast launch facility for placing commercial, government, and military satellites into polar orbit on expendable (unmanned) launch vehicles, and for testing and evaluation of intercontinental ballistic missiles (ICBM) and sub-orbital target and interceptor missiles. In addition to space vehicle and missile launch activities at VAFB, helicopter and aircraft operations are undertaken for purposes such as search-and-rescue, delivery of space vehicle components, launch mission support, security reconnaissance, and training flights. From VAFB, space vehicles are launched into polar orbits on azimuths from 147 to 201 degrees, with sub-orbital flights to 281 degrees. Missile launches are directed west toward Kwajalein Atoll in the Pacific. This over-water sector, from 147 to 281 degrees, comprises the Western Range. Part of the Western Range encompasses the NCI.

Rocket Launch Activities

There are currently six active facilities at VAFB used to launch satellites into polar orbit. One existing launch facility (TP–01), on north VAFB, has not been used in several years but is being reactivated. These facilities support launch programs for the Atlas V, Delta II, Delta IV, Falcon 9 and Minotaur rockets. Various booster and fuel packages can be configured to accommodate payloads of different sizes and weights.

Table 1 shows estimates of the numbers and sizes of rocket launches from VAFB during calendar years 2019 through 2024. The numbers of anticipated launches shown in Table 1 are higher than the historical number of launches that have occurred from VAFB, and are considered conservative estimates; the actual number of launches that occurs in these years may be lower. However, the USAF anticipates an increase in the number of launches by non-commercial entities from VAFB over the next 5 years and the numbers shown in Table 1 are based on this expectation. A large percentage of this anticipated increase will be comprised of smaller launch payloads and rockets than previously utilized at VAFB.

TABLE 1—PREDICTED MAXIMUM NUMBER OF ROCKET LAUNCHES IN CALENDAR YEARS 2019 THROUGH 2024 FROM VAFB

	2019	2020	2021	2022	2023	2024*
Small rockets	5	10	25	40	50	60
Medium rockets	10	15	20	20	30	30
Large rockets	5	5	10	15	20	20
Total launches	20	30	45	75	100	110

*The proposed rule would be valid for only 3 months in 2024 (January through March) therefore not all launches in 2024 would be covered under the proposed rule.

Rocket launches from VAFB have the potential to result in the harassment of pinnipeds that are hauled out of the water as a result of exposure to sound from launch noise (on VAFB) or as a result of exposure to sound from sonic booms (on the NCI only). Based on several years of monitoring data, harassment of marine mammals is unlikely to occur when the intensity of a sonic boom is below 1.0 pounds per square foot (psf) (see further discussion in the ''estimated take'' section below). The likelihood of a sonic boom with a measured psf above 1.0 impacting the NCI is dependent on the size of the rocket (*i.e.,* larger rockets are more likely to result in a sonic boom on the NCI than smaller rockets). The USAF estimated that 33 percent of large rockets, 25 percent of medium sized rockets, and 10 percent of small sized rockets would result in sonic booms on the NCI. The estimated numbers of sonic booms on the NCI per year from rocket launches is shown in Table 2; these numbers are based on the expected number of launches (Table 1) and the percentages described above.

TABLE 2—ESTIMATED SONIC BOOMS ABOVE 1.0 psf PER YEAR IMPACTING THE NCI

Year	Estimated sonic booms per year*
2019	5
2020	*7
2021	11
2022	14
2023	19

TABLE 2—ESTIMATED SONIC BOOMS ABOVE 1.0 psf PER YEAR IMPACTING THE NCI—Continued

Year	Estimated sonic booms per year *
2024	20

* All numbers are calculated based on the number of each rocket size expected to be launched in that year (Table 1) and the percentages of each rocket size expected to result in a sonic boom impacting the NCI based on USAF estimates. The calculated number of sonic booms in 2020 is 6.4, however we rounded up to 7 to be conservative.

Table 3 shows types of rockets that are anticipated for launch from VAFB over the next 5 years and the nearest locations of pinniped haulouts to the launch locations for those rockets. Other small rockets may also be launched from VAFB over the next 5 years but the exact specifications and launch locations for those rockets are unknown at this time.

TABLE 3—ROCKET TYPES LAUNCHED FROM VAFB AND NEAREST LOCATIONS OF PINNIPED HAULOUTS TO LAUNCH LOCATIONS

Rocket	Launch facility	Nearest pinniped haulout	Distance to haulout
Current launch programs			
Atlas V	SLC–3E	North Rocky Point	9.9 km.
Delta II [1]	SLC–2W	Purisima Point	2.3 km.
Delta IV	SLC–6	North Rocky Point	2.3 km.
Falcon 9	SLC–4E	North Rocky Point	8.2 km.
Minotaur	SLC–8	North Rocky Point	1.6 km.
Minotaur/Taurus	LF–576E	North Spur Road	0.8 km.
Future launch programs [2]			
Vector	SLC–8	North Rocky Point	1.6 km.
Firefly	SLC–2	Purisima Point	2.3 km.
New Glenn	TBD	TBD	TBD.
Vulcan	SLC–3E	North Rocky Point	9.9 km.
TBD	TP–01	Purisima Point	7.6 km.

[1] The final launch of the Delta II rocket occurred in September 2018, however a new corporate entity has proposed to reutilize SLC–2W.
[2] All future launch program specifications should be considered notional and subject to change.

As described above, launch facilities at VAFB support launch programs for rockets including the Atlas V, Delta II, Delta IV, Falcon 9, Minotaur, and Taurus rockets. Details on these vehicle types are described below.

(1) Atlas V

The Atlas V vehicle is launched from Space Launch Complex-3E on south VAFB. This Space Launch Complex (SLC) is approximately 9.9 km (6.2 mi) from one of the main haulout areas on VAFB, known as North Rocky Point (see Figure 2 in the application), which encompasses several smaller haulouts. SLC–3E is approximately 11.1 km (6.9 mi) from the closest north VAFB haulout, known as the Spur Road haulout site (Figure 3 in the application) and 13.5 km (8.4 mi) from the next closest haulout, the nearby Purisima Point haulout site (Figure 3 in the application).

The Atlas V is a medium lift vehicle that can be flown in two series of configurations—the Atlas V400 series and the Atlas V500 series. Both series use the Standard Booster as the single body booster. The V400 series accommodates a 4.2 m (13.8 ft) payload fairing (a nose cone used to protect a spacecraft (launch vehicle payload) against the impact of dynamic pressure and aerodynamic heating during launch through an atmosphere) and as many as three solid rocket boosters. The V500 series accommodates a 5.4 m (17.7 ft) fairing and as many as five solid rocket boosters. The Atlas V400 series will lift as much as 7,800 kg (17,196 lbs) into geosynchronous transfer orbit or as much as 13,620 kg (30,027 lbs) into low earth orbit. The Atlas V500 series will lift as much as 8,700 kg (19,180 lbs) into geosynchronous transfer orbit or as much as 21,050 kg (46,407 lbs) into low earth orbit. The Atlas V consists of a common booster core (CBC) 3.8 m (12.5 ft) in diameter and 32.5 m (106.6 ft) high) powered by an RD180 engine that burns a liquid propellant fuel consisting of liquid oxygen and RP1 fuel (kerosene). The RD180 engine provides 840,000 lbs of thrust on liftoff. There is a Centaur upper stage (3.1 m (10.2 ft) in diameter and 12.7 m (41.7 ft) high) powered by a liquid oxygen and liquid hydrogen fuel.

(2) Delta IV

The Delta IV is launched from SLC–6, which is 2.3 km (1.4 mi) north of the main harbor seal haulout site at North Rocky Point (see Figure 2 in the USAF application). The Delta IV family of launch vehicles consists of five launch vehicle configurations utilizing a CBC first stage (liquid fueled) and zero, two, or four strap on solid rocket GEMs. The Delta IV comes in four medium lift configurations and one heavy lift configuration consisting of multiple CBCs. The Delta IV can carry payloads from 4,210 to 13,130 kg (9,281 to 28,947 lbs) into geosynchronous transfer orbit.

(3) Falcon 9

The Falcon 9 is SpaceX's launch vehicle. The Falcon 9 is a two-stage rocket designed and manufactured by

SpaceX for transport of satellites into orbit. The First Stage of the Falcon 9 is designed to be reusable, while the second stage is not reusable. The Falcon 9 First Stage is 12 ft (3.7 m) in diameter and 160 ft (48.8 m) in height, including the interstage that would remain attached during landing.

(4) Minotaur

The Minotaur I is a four stage, all solid propellant ground launch vehicle and is launched from SLC–8 on south VAFB (Figure 2 in the USAF application), approximately 1.6 km (1 mi) from the North Rocky Point haulout site. The launch vehicle consists of modified Minuteman II Stage I and Stage II segments, mated with Pegasus upper stages (Orbital Sciences Corporation, 2006). The Minotaur is a small vehicle, approximately 19.2 m (63 ft) tall (Orbital Sciences Corporation 2006b), with approximately 215,000 lbs of thrust.

(5) Taurus

The standard Taurus is a small launch vehicle, at approximately 24.7 m (81 ft) tall and is launched in two different configurations (Defense Advanced Research Projects Agency (DARPA) and standard) with different first stages providing 500,000 or 400,000 lbs of thrust, respectively. The different vehicle configurations have different thrust characteristics, with the standard configuration providing less thrust than DARPA. The Taurus is launched from 576E on north VAFB, approximately 0.5 km (0.3 mi) from the Spur Road harbor seal haulout site and 2.3 km (1.4 mi) from the Purisima Point haulout site (see Figure 3 in the USAF application).

SpaceX Falcon 9 First Stage Recovery Activities

As described above, the Falcon 9 is a two-stage rocket designed and manufactured by SpaceX for transport of satellites into orbit. The First Stage of the Falcon 9 is designed to be reusable, while the second stage is not reusable. The proposed action includes up to twelve Falcon 9 First Stage recoveries per year. The Falcon 9 First Stage is recovered via an in-air boost-back maneuver and landings at VAFB or at a contingency landing location offshore. The Falcon 9 First Stage is the only rocket type that may be recovered via boost-back and landing as part of the proposed action.

After launch of the Falcon 9, the boost-back and landing sequence begins when the rocket's First Stage separates from the second stage and the Merlin engines of the First Stage cut off. After First Stage engine cutoff, rather than dropping the First Stage in the Pacific Ocean, exoatmospheric cold gas thrusters are triggered to flip the First Stage into position for retrograde burn. Three of the nine First Stage Merlin engines are restarted to conduct the retrograde burn in order to reduce the velocity of the First Stage and to place the First Stage in the correct angle to land. Once the First Stage is in position and approaching its landing target, the three engines cut off to end the boost-back burn. The First Stage then performs a controlled descent using atmospheric resistance to slow the stage down and guide it to the landing pad target. The First Stage is outfitted with grid fins that allow cross range corrections as needed. The landing legs on the First Stage then deploy in preparation for a final single engine burn that slow the First Stage to a velocity of zero before landing on the landing pad at SLC–4W.

During the First Stage's descent, a sonic boom would be generated when the First Stage reaches a rate of travel that exceeds the speed of sound. Sonic booms would occur in proximity to the landing area with the highest sound levels generated from sonic booms generally focused in the direction of the landing area, and may be heard during or briefly after the boost-back and landing, depending on the location of the receiver. Model results have indicated a boost-back and landing of the Falcon 9 First Stage at SLC–4W could produce sonic booms with overpressures that would potentially be as high as 8.5 psf at VAFB and potentially as high as 3.1 psf at the NCI (ManTech SRS Technologies, Inc, 2018). At the time of this proposed rule, only one recovery of the Falcon 9 First Stage, including the boost-back and landing of the Falcon 9 First Stage, had occurred at VAFB. Acoustic monitoring data from that event demonstrated that the sonic boom at the haulout nearest the landing location was measured at 1.78 psf and the maximum landing engine noise was estimated at 96.66 dB (ManTech SRS Technologies, Inc, 2018). Monitoring at the NCI was not required during this activity as sonic boom modeling prior to the activity indicated no sonic boom would impact the NCI (ManTech SRS Technologies, Inc, 2018).

As a contingency action to landing the Falcon 9 First Stage on the SLC–4W pad at VAFB, SpaceX may return the Falcon 9 First Stage booster to a barge in the Pacific Ocean. The barge is specifically designed to be used as a First Stage landing platform and would be located at least 27 nm (50 km) offshore of VAFB or within an area even further offshore called the Iridium Landing Area. These contingency landing locations would be used when landing at SLC–4W would not be feasible. The maneuvering and landing process described above for a pad landing would be the same for a barge landing. Sonic boom modeling indicates that landings that occur at either of the proposed contingency landing locations offshore would result in sonic booms below 1.0 psf at any pinniped haulouts, thus marine mammal harassment is not an expected outcome from landings at those contingency landing locations offshore.

Landing noise would be generated during each boost-back event. SpaceX proposes to use a three-engine burn during landing. This engine burn, lasting approximately 17 seconds, would generate noise between 70 and 110 decibels (dB) re 20 micro Pascals (μPa) (non-pulse, in-air noise) centered on SLC–4W. This landing noise event would be of short duration (approximately 17 seconds). Although, during a landing event at SLC–4W, landing noise between 70 and 90 dB would be expected to overlap pinniped haulout areas at and near Point Arguello and Purisima Point, no pinniped haulouts would experience landing noise of 90 dB or greater.

The boost-back and landing of the Falcon 9 First Stage occurs less than 10 minutes after the Falcon 9 launches from VAFB (USAF, 2018). Hauled out pinnipeds may respond to a sonic boom associated with a Falcon 9 First Stage boost-back and landing by alerting, moving or flushing to the water. However, any pinnipeds that respond to a Falcon 9 First Stage boost-back and landing by moving or flushing to the water are expected to be the same individuals that responded in such a way to the initial launch of the rocket, less than 10 minutes prior to the boost-back and landing. NMFS would consider those individual marine mammals to have been taken by the stimuli associated with the initial launch, and would therefore not consider them as taken again by the boost-back and landing less than 10 minutes later, as we do not consider an individual marine mammal to be taken given noise exposure more than once within a 24 hour period. We expect that individual marine mammals that do not respond to the stimuli associated with the launch of the rocket will also not respond to the stimuli associated with the boost-back and landing of the Falcon 9 First Stage less than 10 minutes later. Therefore, Falcon 9 First Stage recovery activities will not result in any additional marine mammals being taken, beyond those taken by the launch. As the potential for take

resulting from the boost-back and landing of the Falcon 9 First Stage is so low as to be discountable, Falcon 9 First Stage recovery is not analyzed further in this document.

Missile Launch Activities

A variety of small missiles are launched from various facilities on north VAFB, including Minuteman III, an ICBM which is launched from underground silos. In addition, several types of interceptor and target vehicles are launched for the Missile Defense Agency (MDA). The MDA develops various systems and elements, including the Ballistic Missile Defense System (BMDS).

The BMDS test plans, including those involving tests from VAFB, are subject to constant change as the BMDS is being developed. It is difficult for the MDA to predict its launch schedule or number of launches over the next five years. However, due to test resource limitations, MDA does not envision conducting more than three missile tests per quarter (on average) over the next five years from VAFB, and none of the missiles would be larger than the Minuteman III. As described above, the USAF anticipates not more than 15 missile launches would occur in any year between 2019 through 2024.

LF–09 is the closest active missile launch facility to a haulout area, located about 0.5 km from Little Sal (see Figure 3 in the application). The trajectories of all missile launches are nearly due westward; thus, they do not cause sonic boom impacts on the NCI and therefore take of marine mammals on the NCI from missile launches is not an expected outcome of the specified activities.

Aircraft and Helicopter Operations

The VAFB airfield, located on north VAFB, supports various aircraft operations. Aircraft operations include tower operations, such as take-offs and landings (training operations), and range operations such as overflights and flight tests. Over the past five years, an average of slightly more than 600 flights has occurred each year.

Fixed-wing aircraft use VAFB for various purposes, including delivering rocket or missile components, high-altitude launches of space vehicles and emergency landings. VAFB is also used for flight testing, evaluation of fixed-wing aircraft and training exercises, including touch and goes. Three approved routes are used that avoid established pinniped haulout sites. Aircraft flown through VAFB airspace and supported by 30th Space Wing include, but are not limited to: B–1 and B–2 bombers, F–15, F–16 and F–22 fighters, V/X–22s, and KC–135 tankers.

Helicopter operations also occur at VAFB, but the number of helicopter operations at VAFB has decreased considerably since 2008 when the deactivation of the VAFB helicopter squadron occurred. Other squadrons and units occasionally use VAFB for purposes such as transiting through the area, exercises and launch mission support. Emergency helicopter operations, including but not limited to search-and-rescue and wildfire containment actions, also occur occasionally.

Unmanned Aerial Systems (also known as ''drone'') operations at VAFB represent a relatively new activity but may increase over the next five years. UAS operations may include either rotary or fixed wing aircraft. These are typically divided into as many as six classes which graduate in size from class 0 (which are often smaller than 5 inches in diameter and always weigh less than one pound) to Class 5 (which can be as large as a small piloted aircraft) (Table 5). UAs classes 0, 1, 2 and 3 can be used in almost any location, while classes 4 and 5 typically require a runway and for that reason would only be operated from the VAFB airfield.

TABLE 5—CLASSES OF UNMANNED AERIAL SYSTEMS

Class	Weight (pounds)	Minimum dimension	Maximum dimension	Typical operating altitude (feet)	Typical airspeed (knots)
0	<1	''large insect''	50 cm	Any	any.
1	1–20	>50 cm	2 meters	<1,200	<100.
2	21–55	>2 m	10 meters	<3,500	<250.
3	<1,320	>10 meters	n/a	<18,000	<250.
4	>1,320	>10 meters	n/a	<18,000	Any.
5	>1,320	>10 meters	n/a	<18,000	Any.

Take of hauled out pinnipeds from aircraft operations may occur as a result of visual or auditory stimuli in limited instances where the aircraft operate at low altitudes near pinniped haulouts. While harassment of hauled out pinnipeds from Class 0, 1 or 2 UAS is unlikely to occur at altitudes of 200 feet and above (Erbe *et al.,* 2017; Pomeroy *et al.,* 2015; Sweeney *et al.,* 2016; Sweeney and Gelatt, 2017), information on pinniped responses to larger UASs is not widely available. However, based on the specifications of Class 3, 4 and 5 UASs (Table 5), the likelihood of harassment resulting from overflights by UASs of that size would likely depend on several factors including noise signature and means of propulsion (*i.e.,* rocket propelled or engine propelled). Except for take-off and landing actions, a minimum altitude of 300 feet will be maintained for Class 0–2 UAS over all known marine mammal haulouts when marine mammals are present. Class 3 UAS will maintain a minimum altitude of 500 feet, except at take-off and landing. No Class 4 or 5 UAS will be flown below 1,000 feet over haulouts.

The USAF anticipates that take of marine mammals from aircraft operations would be minimal; however, to be conservative, the USAF has requested authorization for incidental take as a result of aircraft operations.

Description of Marine Mammals in the Area of Specified Activities

There are six marine mammal species with expected occurrence in the project area (including at VAFB, on the NCI, and in the waters surrounding VAFB and the NCI) that are expected to be affected by the specified activities. These are listed in Table 6. This section provides summary information regarding local occurrence of these species. We have reviewed USAF's species descriptions, including life history information, for accuracy and completeness and refer the reader to Section 3 of the USAF's application, as well as to NMFS' Stock Assessment Reports (SAR; *https://*

www.fisheries.noaa.gov/topic/population-assessments#marine-mammals), rather than reprinting all of the information here. Additional general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species*).

There are an additional 28 species of cetaceans with expected or possible occurrence in the project area. However, we have determined that the only potential stressors associated with the specified activities that could result in take of marine mammals (*i.e.,* launch noise, sonic booms and aircraft operations) only have the potential to result in harassment of marine mammals that are hauled out of the water. Therefore, we have concluded that the likelihood of the proposed activities resulting in the harassment of any cetacean to be so low as to be discountable. As we have concluded that the likelihood of any cetacean being taken incidentally as a result of USAF's proposed activities to be so low as to be discountable, cetaceans are not considered further in this proposed rule.

Table 6 lists all species with expected potential for occurrence in the vicinity of the project during the project timeframe that are likely to be affected by the specified activities, and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2018). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or proposed for authorization here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific and Alaska SARs (*e.g.,* Carretta *et al.,* 2018; Muto *et al.,* 2018). All values presented in Table 6 are the most recent available at the time of publication and are available in the 2017 SARs (Carretta *et al.,* 2018; Muto *et al.,* 2018) and draft 2018 SARs (available online at: *https://www.fisheries.noaa.gov/topic/population-assessments#marine-mammals*).

TABLE 6—MARINE MAMMAL SPECIES POTENTIALLY PRESENT IN THE PROJECT AREA THAT MAY BE AFFECTED BY THE PROPOSED ACTIVITIES

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions):						
California sea lion	*Zalophus californianus*	U.S.	-; N	257,606 (n/a, 233,515, 2014).	14,011	≥197
Northern fur seal	*Callorhinus ursinus*	California	-; N	14,050 (n/a, 7,524, 2013)	451	≥0.8
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	-; N	41,638 (n/a, 41,638, 2015).	2,498	108
Guadalupe fur seal	*Arctocephalus philippii townsendi.*	Mexico	T/D; Y	20,000 (n/a, 15,830, 2010).	542	≥3.2
Family Phocidae (earless seals):						
Pacific harbor seal	*Phoca vitulina richardii*	California	-; N	30,968 (n/a, 27,348, 2012).	1,641	30
Northern elephant seal	*Mirounga angustirostris*	California breeding	-; N	179,000 (n/a, 81,368, 2010).	4,882	4

[1] Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2] NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/topic/population-assessments#marine-mammals.* CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable.

[3] These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range.

All species that could potentially occur in the proposed survey areas and that may be affected by the proposed activities are included in Table 6. As described below, all six species (with six managed stocks) temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur.

Pacific Harbor Seal

Harbor seals inhabit coastal and estuarine waters and shoreline areas of the northern hemisphere from temperate to polar regions. The eastern North Pacific subspecies is found from Baja California north to the Aleutian Islands and into the Bering Sea. Multiple lines of evidence support the existence of geographic structure among harbor seal populations from California to Alaska (Carretta *et al.,* 2016). However, because stock boundaries are difficult to meaningfully draw from a biological perspective, three separate harbor seal stocks are recognized for management purposes along the west coast of the continental United States: (1) Washington inland waters, (2) Oregon and Washington coast, and (3) California (Carretta *et al.,* 2016). In addition, harbor seals may occur in Mexican waters, but these animals are not considered part of the California stock. Only the California stock is considered in these proposed regulations due to the distribution of the stock and the geographic scope of the proposed activities. Although the need

for stock boundaries for management is real and is supported by biological information, it should be noted that the exact placement of a boundary between California and Oregon for stock delineation purposes was largely a political/jurisdictional convenience (Carretta *et al.* 2015).

Pacific harbor seals are nonmigratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction (Scheffer and Slipp 1944, Fisher 1952, Bigg 1969, 1981, Hastings *et al.* 2004). In California, over 500 harbor seal haulout sites are widely distributed along the mainland and offshore islands, and include rocky shores, beaches and intertidal sandbars (Lowry *et al.* 2005). Harbor seals mate at sea and females give birth during the spring and summer, though the pupping season varies with latitude. Harbor seal pupping takes place at many locations and rookery size varies from a few pups to many hundreds of pups.

Harbor seals are the most common marine mammal inhabiting VAFB, congregating on multiple rocky haulout sites along the VAFB coastline. They are local to the area, rarely traveling more than 50 km from haulout sites (pers comm., M. Lowry, NMFS SWFSC, to J. Carduner, NMFS OPR). There are 12 harbor seal haulout sites on south VAFB; of these, 10 sites represent an almost continuous haulout area which is used by the same animals. Virtually all of the haulout sites at VAFB are used during low tides and are wave-washed or submerged during high tides. Additionally, the harbor seal is the only species that regularly hauls out near the VAFB harbor. The main harbor seal haulouts on VAFB are near Purisima Point and at Lion's Head (approximately 0.6 km south of Point Sal) on north VAFB and between the VAFB harbor north to South Rocky Point Beach on south VAFB (ManTech 2009) (see Figure 2 in the USAF's application).

Pups are generally present in the region from March through July (USAF, 2018). The best available information of harbor seal abundance on VAFB is USAF monthly survey data. Within the affected area on VAFB, a total of up to 332 adults and 34 pups have been recorded, at all haulouts combined, in monthly counts from 2013 to 2015 (ManTech 2015). The harbor seal population at VAFB has undergone an apparent decline in recent years (USAF, 2018). This decline has been attributed to a series of natural landslides at south VAFB, resulting in the abandonment of many haulout sites. These slides have also resulted in extensive down-current sediment deposition, making these sites accessible to coyotes, which are now regularly seen in the area. Some of the displaced seals have moved to other sites at south VAFB, while others likely have moved to Point Conception, about 6.5 km south of the southern boundary of VAFB (USAF, 2018).

Harbor seals also haul out, breed, and pup in isolated beaches and coves throughout the coasts of San Miguel Island (SMI), Santa Rosa Island (SRI), San Nicolas Island (SNI) and Santa Cruz Island (SCI) (Lowry, 2002). The best available information of harbor seal abundance on the NCI is NMFS aerial survey data from 2011–2015 (Lowry *et al.,* 2017). During aerial surveys conducted by NMFS from 2011–2015, a mean of 589 harbors seals was recorded at SMI, a mean of 181 was recorded at SCI, and a mean of 247 was recorded at SRI (Lowry *et al.*, 2017). On SMI, they occur along the north coast at Tyler Bight and from Crook Point to Cardwell Point. Additionally, they regularly breed on SMI. On Santa Cruz Island, they inhabit small coves and rocky ledges along much of the coast. Harbor seals are scattered throughout Santa Rosa Island and also are observed in small numbers on Anacapa Island.

California Sea Lion

California sea lions range from the Gulf of California north to the Gulf of Alaska, with breeding areas located in the Gulf of California, western Baja California, and southern California. Five genetically distinct geographic populations have been identified: (1) Pacific Temperate, (2) Pacific Subtropical, (3) Southern Gulf of California, (4) Central Gulf of California and (5) Northern Gulf of California (Schramm *et al.,* 2009). Rookeries for the Pacific Temperate population are found within U.S. waters and just south of the U.S.-Mexico border, and animals belonging to this population may be found from the Gulf of Alaska to Mexican waters off Baja California. Animals belonging to other populations (*e.g.,* Pacific Subtropical) may range into U.S. waters during non-breeding periods. For management purposes, a stock of California sea lions comprising those animals at rookeries within the United States is defined (*i.e.,* the U.S. stock of California sea lions) (Carretta *et al.,* 2017).

Beginning in January 2013, elevated strandings of California sea lion pups were observed in southern California, with live sea lion strandings nearly three times higher than the historical average. Findings to date indicate that a likely contributor to the large number of stranded, malnourished pups was a change in the availability of sea lion prey for nursing mothers, especially sardines. The Working Group on Marine Mammal Unusual Mortality Events determined that the ongoing stranding event meets the criteria for an Unusual Mortality Event (UME) and declared California sea lion strandings from 2013 through 2017 to be one continuous UME. The causes and mechanisms of this event remain under investigation. For more information on the UME, see: *https://www.fisheries.noaa.gov/national/marine-life-distress/2013-2017-california-sea-lion-unusual-mortality-event-california.*

Rookery sites in southern California are limited to SMI and the southerly Channel Islands of San Nicolas, Santa Barbara, and San Clemente (Carretta *et al.,* 2015). Males establish breeding territories during May through July on both land and in the water. Females come ashore in mid-May and June where they give birth to a single pup approximately four to five days after arrival and will nurse pups for about a week before going on their first feeding trip. Adult and juvenile males will migrate as far north as British Columbia, Canada while females and pups remain in southern California waters in the non-breeding season. In warm water (El Niño) years, some females are found as far north as Washington and Oregon, presumably following prey.

The best available information on California sea lion abundance on VAFB is USAF monthly survey data. California sea lions are common offshore of VAFB and haul out on rocks and beaches along the coastline of VAFB. At south VAFB, California sea lions haul out on north Rocky Point, with numbers often peaking in spring. They have been reported at Point Arguello and Point Pedernales (both on south VAFB) in the past, although none have been noted there over the past several years. Individual sea lions have been noted hauled out throughout the VAFB coast; these were transient or stranded specimens. They regularly haul out on Lion Rock, north of VAFB and immediately south of Point Sal, and occasionally haul out on Point Conception, south of VAFB. In 2014, counts of California sea lions at haulouts on VAFB increased substantially, ranging from 47 to 416 during monthly counts. Despite their prevalence at haulout sites at VAFB, California sea lions rarely pup on the VAFB coastline (ManTech 2015); no pups were observed in 2013 or 2014 (ManTech 2015) and 1 pup was observed in 2015 (VAFB, unpub. data). Successful pupping has never been observed on VAFB; one possible explanation is that only California sea

lions affected by domoic acid toxicity give birth at VAFB. These pups are either stillborn or very likely do not survive long (USAF, 2018).

Pupping occurs in large numbers on SMI at the rookeries found at Point Bennett on the west end of the island and at Cardwell Point on the east end of the island (Lowry 2002). Sea lions haul out at the west end of Santa Rosa Island at Ford Point and Carrington Point. A few California sea lions have been born on Santa Rosa Island, but no rookery has been established. On Santa Cruz Island, California sea lions haul out from Painted Cave almost to Fraser Point, on the west end. California sea lions also haul out at Gull Island, off the south shore near Punta Arena. Pupping appears to be increasing there. Sea lions also haul out near Potato Harbor, on the northeast end of Santa Cruz. California sea lions haul out by the hundreds on the south side of East Anacapa Island (Lowry *et al.,* 2017).

The best available information on California sea lion abundance on the NCI is NMFS aerial survey data from 2011–2015 (Lowry *et al.,* 2017). During aerial surveys from 2011–2015, a mean of 62,150 California sea lions were recorded at haulouts on SMI, a mean of 1322 was recorded at SCI and a mean of 944 was recorded at SRI (Lowry *et al.,* 2017).

Northern Elephant Seal

Northern elephant seals range in the eastern and central North Pacific Ocean, from as far north as Alaska and as far south as Mexico. They spend much of the year, generally about nine months, in the ocean. They spend much of their lives underwater, diving to depths of about 1,000 to 2,500 ft (330–800 m) for 20- to 30-minute intervals with only short breaks at the surface, and are rarely seen at sea for this reason. Northern elephant seals breed and give birth in California and Baja California (Mexico), primarily on offshore islands, from December to March (Stewart *et al.* 1994). Adults return to land between March and August to molt, with males returning later than females. Adults return to their feeding areas again between their spring/summer molting and their winter breeding seasons.

Populations of northern elephant seals in the U.S. and Mexico are derived from a few tens or hundreds of individuals surviving in Mexico after being nearly hunted to extinction (Stewart *et al.,* 1994). Given the recent derivation of most rookeries, no genetic differentiation would be expected. Although movement and genetic exchange continues between rookeries, most elephant seals return to their natal rookeries when they start breeding (Huber *et al.,* 1991). The California breeding population is now demographically isolated from the Baja California population and is considered to be a separate stock.

The best available information on northern elephant seal abundance on VAFB is USAF monthly survey data. Northern elephant seals haul out sporadically on rocks and beaches along the coastline of VAFB; monthly counts in 2013 and 2014 recorded between 0 and 191 elephant seals within the affected area (ManTech 2015). Northern elephant seal pupping at VAFB was documented for the first time in January 2017 with 18 pups born and weaned. In January 2018, a total of 25 pups were observed born and weaned. (USAF, 2018).

The best available information on northern elephant seal abundance on the NCI is NMFS aerial survey data from 2011–2015 (Lowry *et al.,* 2017). Point Bennett on the west end of SMI is the primary northern elephant seal rookery in the NCI, with another rookery at Cardwell Point on the east end of SMI (Lowry 2002). They also pup and breed on Santa Rosa Island, mostly on the west end. Northern elephant seals are rarely seen on Santa Cruz and Anacapa Islands. During aerial surveys of the NCI conducted by NMFS from 2011–2015, a mean of 2,350 northern elephant seals was recorded at SMI, and a mean of 816 was recorded at SRI. None were observed at Santa Cruz Island (Lowry *et al.,* 2017).

Steller Sea Lion

Steller sea lions are distributed mainly around the coasts to the outer continental shelf along the North Pacific rim from northern Hokkaido, Japan through the Kuril Islands and Okhotsk Sea, Aleutian Islands and central Bering Sea, southern coast of Alaska and south to California (Loughlin *et al.,* 1984). The species as a whole was ESA-listed as threatened in 1990 (55 FR 49204, November 26, 1990). In 1997, the species was divided into western and eastern distinct population segments (DPS), with the western DPS reclassified as endangered under the ESA and the eastern DPS retaining its threatened listing (62 FR 24345, May 5, 2997). On October 23, 2013, NMFS found that the eastern DPS has recovered; as a result of the finding, NMFS removed the eastern DPS from ESA listing. Only the eastern DPS is considered in this proposed authorization due to its distribution and the geographic scope of the action.

Prior to 2012, there were no records of Steller sea lions observed at VAFB. In April and May 2012, Steller sea lions were observed hauled out at North Rocky Point on VAFB, representing the first time the species had been observed at VAFB during launch monitoring and monthly surveys conducted over the past two decades (MMCG and SAIC, 2013). The best available information on Steller sea lion abundance on VAFB is USAF monthly surveys. Since 2012, Steller sea lions have been observed frequently in routine monthly surveys, with as many as 16 individuals recorded. In 2017, the highest number observed at VAFB was 11, in July (CEMML, 2018). Steller sea lions once had two small rookeries on SMI, but these were abandoned after the 1982–1983 El Niño event (DeLong and Melin, 2000, Lowry, 2002); these rookeries were once the southernmost colonies of the eastern stock of this species. Due to their very limited numbers on the NCI, survey data for Steller sea lions on the NCI is not available, therefore the best available information on abundance on the NCI is anecdotal information from subject matter experts. In recent years, between two to four juvenile and adult males have been observed on a somewhat regular basis on San Miguel Island (pers. comm. Sharon Melin, NMFS Marine Mammal Center (MML), to J. Carduner, NMFS). Steller sea lions have not been observed on the other Channel Islands.

Northern Fur Seal

Northern fur seals occur from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan. Due to differing requirements during the annual reproductive season, adult males and females typically occur ashore at different, though overlapping, times. Adult males occur ashore and defend reproductive territories during a three month period from June through August, though some may be present until November (well after giving up their territories). Adult females are found ashore for as long as six months (June–November). After their respective times ashore, fur seals of both sexes spend the next seven to eight months at sea (Roppel, 1984). Peak pupping is in early July and pups are weaned at three to four months. Some juveniles are present year-round, but most juveniles and adults head for the open ocean and a pelagic existence until the next year. Northern fur seals exhibit high site fidelity to their natal rookeries. Two stocks of northern fur seals are recognized in U.S. waters: An eastern Pacific stock and a California stock (formerly referred to as the San Miguel Island stock). Only the California stock is considered in this proposed

authorization due to its geographic distribution.

Northern fur seals have rookeries on SMI at Point Bennett and on Castle Rock. Comprehensive count data for northern fur seals on San Miguel Island are not available, therefore the best available information on northern fur seal abundance on the NCI comes from subject matter experts which indicates the population is at its maximum in summer (June–August) with an estimated 13,384 animals at SMI, with approximately half that number present in the fall (September and October) and approximately 50–200 animals present from November through May (pers. comm. Sharon Melin, NMFS MML, to J. Carduner, NMFS OPR). SMI is the only island in the NCI on which northern fur seals have been observed, and on SMI they only occur at the west end of the island and on Castle Rock (a small offshore rock on the northwest side of the island) (pers. comm. Sharon Melin, NMFS MML, to J. Carduner, NMFS OPR). Although the population at SMI was established by individuals from Alaska and Russian Islands during the late 1960s, most individuals currently found on SMI are considered resident to the island. No haulout or rookery sites exist for northern fur seals on the mainland coast. The only individuals that appear on mainland beaches are stranded animals.

Guadalupe Fur Seal

Guadalupe fur seals are found along the west coast of the United States, with the majority of the population found on islands in Mexico. They were abundant prior to seal exploitation, when they were likely the most abundant pinniped species on the Channel Islands, but are considered uncommon in Southern California. They are typically found on shores with abundant large rocks, often at the base of large cliffs (Belcher and Lee, 2002). Increased strandings of Guadalupe fur seals started occurring along the entire coast of California in early 2015. This event was declared a marine mammal UME. Strandings were eight times higher than the historical average, peaking from April through June 2015, and have since lessened but continue at a rate that is well above average. Most stranded individuals have been weaned pups and juveniles (1–2 years old). For more information on this UME, see: *https://www.fisheries.noaa.gov/national/marine-life-distress/2015-2018-guadalupe-fur-seal-unusual-mortality-event-california.*

Comprehensive survey data on Guadalupe fur seals in the NCI is not readily available, therefore the best available information on Guadalupe fur seal abundance is from subject matter experts. On SMI, one to several male Guadalupe fur seals had been observed annually between 1969 and 2000 (DeLong and Melin, 2000) and juvenile animals of both sexes have been seen occasionally over the years (Stewart *et al.,* 1987). The first adult female at San Miguel Island was seen in 1997. In June 1997, she gave birth to a pup in rocky habitat along the south side of the island and, over the next year, reared the pup to weaning age. This was apparently the first pup born in the Channel Islands in at least 150 years. Since 2008, individual adult females, subadult males, and between one and three pups have been observed annually on SMI. There are estimated to be approximately 20–25 individuals that have fidelity to San Miguel, mostly inhabiting the southwest and northwest ends of the island. A total of 14 pups have been born on the island since 2009, with no more than 3 born in any single season (pers. comm., S. Melin, NMFS MML, to J. Carduner, NMFS OPR). Thirteen individuals and two pups were observed in 2015 (NMFS 2016). No haulout or rookery sites exist for Guadalupe fur seals on the mainland coast, including VAFB. The only individuals that do appear on mainland beaches are stranded animals.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.,* low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Pinnipeds in water; Phocidae (true seals): Generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz; and
- Pinnipeds in water; Otariidae (eared seals): Generalized hearing is estimated to occur between 60 Hz and 39 kHz.

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Six species of marine mammal (four otariid and two phocid species) have the reasonable potential to co-occur with the proposed activities. Please refer to Table 6.

TABLE 4—RELEVANT MARINE MAMMAL FUNCTIONAL HEARING GROUPS AND THEIR GENERALIZED HEARING RANGES

Hearing group	Generalized hearing range *
Phocid pinnipeds (PW) (underwater) (true seals).	50 Hz to 86 kHz.
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals).	60 Hz to 39 kHz.

* Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.,* 2007) and PW pinniped (approximation).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The *Estimated Take* section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The *Negligible Impact Analysis and Determination* section considers the content of this section, the *Estimated Take* section, and the *Proposed*

Mitigation section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Description of Sound Sources

This section contains a brief technical background on sound, the characteristics of certain sound types, and on metrics used in this proposal inasmuch as the information is relevant to the specified activity and to a discussion of the potential effects of the specified activity on marine mammals found later in this document.

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in hertz (Hz) or cycles per second. Wavelength is the distance between two peaks or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and typically attenuate (decrease) more rapidly, except in certain cases in shallower water. Amplitude is the height of the sound pressure wave or the ''loudness'' of a sound and is typically described using the relative unit of the dB. A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure and is a logarithmic unit that accounts for large variations in amplitude; therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1 m from the source while the received level is the SPL at the listener's position. Note that all airborne sound levels in this document are referenced to a pressure of 20 μPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Root mean square is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Root mean square accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper, 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

Sound exposure level (SEL; represented as dB re 1 μPa^2-s) represents the total energy contained within a pulse and considers both intensity and duration of exposure. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-p) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source and is represented in the same units as the rms sound pressure. Another common metric is peak-to-peak sound pressure (pk-pk), which is the algebraic difference between the peak positive and peak negative sound pressures. Peak-to-peak pressure is typically approximately 6 dB higher than peak pressure (Southall *et al.,* 2007).

A-weighting is applied to instrument-measured sound levels in an effort to account for the relative loudness perceived by the human ear, as the ear is less sensitive to low audio frequencies, and is commonly used in measuring airborne noise. The relative sensitivity of pinnipeds listening in air to different frequencies is more-or-less similar to that of humans (Richardson *et al.,* 1995), so A-weighting may, as a first approximation, be relevant to pinnipeds listening to moderate-level sounds.

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and human activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from a given activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals. Details of source types are described in the following text.

Sounds are often considered to fall into one of two general types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) for an in-depth discussion of these concepts.

Pulsed sound sources (*e.g.,* airguns, explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI, 1986, 2005; Harris, 1998; NIOSH, 1998; ISO, 2003) and occur either as isolated events or repeated in some succession. Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-pulsed sounds can be tonal, narrowband, or broadBand, brief or prolonged, and may be either continuous or non-continuous (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (such as those used by the U.S. Navy). The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

The effects of sounds on marine mammals are dependent on several factors, including the species, size, and behavior (feeding, nursing, resting, etc.) of the animal; the intensity and duration of the sound; and the sound propagation properties of the environment. Impacts to marine species can result from physiological and behavioral responses to both the type and strength of the acoustic signature (Viada *et al.,* 2008). The type and severity of behavioral impacts are more difficult to define due to limited studies addressing the behavioral effects of sounds on marine mammals. Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973).

The effects of sounds from the proposed activities are expected to result in behavioral disturbance of marine mammals. Due to the expected sound levels of the activities proposed and the distance of the activity from marine mammal habitat, the effects of

sounds from the proposed activities are not expected to result in temporary or permanent hearing impairment (TTS and PTS, respectively), non-auditory physical or physiological effects, or masking in marine mammals. Data from monitoring reports associated with authorizations issued by NMFS previously for similar activities in the same location as the planned activities (described further below) provides further support for the assertion that TTS, PTS, non-auditory physical or physiological effects, and masking are not likely to occur (USAF 2013b; SAIC 2012). Therefore, TTS, PTS, non-auditory physical or physiological effects, and masking are not discussed further in this section.

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Behavioral responses to sound are highly variable and context-specific and reactions, if any, depend on species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day, and many other factors (Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007).

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.,* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC, 2003; Wartzok *et al.,* 2003).

Controlled experiments with captive marine mammals have shown pronounced behavioral reactions, including avoidance of loud underwater sound sources (Ridgway *et al.,* 1997; Finneran *et al.,* 2003). These may be of limited relevance to the proposed activities given that airborne sound, and not underwater sound, may result in harassment of marine mammals as a result of the proposed activities; however we present this information as background on the potential impacts of sound on marine mammals. Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds, 2002; Thorson and Reyff, 2006; see also Gordon *et al.,* 2004; Wartzok *et al.,* 2003; Nowacek *et al.,* 2007).

The onset of noise can result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include: reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior; avoidance of areas where sound sources are located; and/or flight responses (Richardson *et al.,* 1995).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could potentially be biologically significant if the change affects growth, survival, or reproduction. The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007).

Marine mammals that occur in the project area could be exposed to airborne sounds that have the potential to result in behavioral harassment, depending on an animal's distance from the sound. Airborne sound could potentially affect pinnipeds that are hauled out. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as temporarily abandoning their habitat. Hauled out pinnipeds may flush from a haulout into the water. Though pup abandonment could theoretically result from these reactions, site-specific monitoring data (described below) indicate that pup abandonment is not likely to occur as a result of the specified activity.

Potential Effects From the Specified Activity

This section includes a discussion of the active acoustic sound sources associated with the USAF's proposed activity and the likelihood for these sources to result in harassment of marine mammals. Potential acoustic sources associated with the USAF's proposed activity include launch noise, sonic booms, and aircraft noise. Marine mammals on the NCI would be impacted only by sonic booms associated with the proposed activities (*i.e.,* launch noise and aircraft noise are not expected to impact marine mammals on the NCI), while marine mammals on VAFB would be impacted by launch noise, aircraft noise and sonic booms from Falcon 9 boost-backs and landings (however, as described above, sounds associated with Falcon 9 First Stage boost-backs and landings are not expected to result in additional take of marine mammals and are therefore not addressed here). Sounds produced by the proposed activities are expected to be impulsive, due to sonic booms, and non-pulse noise, due to aircraft sounds. All noises resulting from the USAF's proposed activities that may impact marine mammals are airborne.

Sonic Boom

Sonic booms may disturb pinnipeds that are hauled out of the water in the area of exposure, depending on the species exposed and the level of the sonic boom. The USAF has monitored pinniped responses to rocket launches on VAFB and the NCI during numerous launches over the past two decades. Observed reactions of pinnipeds at the NCI to sonic booms have ranged from no response to heads-up alerts, from startle responses to some movements on land, and from some movements into the water to very rare stampedes.

Data from launch monitoring reports by the USAF on the NCI have shown that pinniped reactions to sonic booms are correlated with the level of the sonic boom. Table 7 presents a summary of monitoring efforts at the NCI from 1999 to 2017 during which acoustic measurements were successfully recorded and during which pinnipeds were observed. Monitoring data has consistently shown that reactions among pinnipeds to sonic booms vary between species, with harbor seals typically responding at the highest rates, followed by California sea lions, with northern elephant seals and northern fur seals generally being much less responsive (Table 7). Because Steller sea lions and Guadalupe fur seals occur in the project area relatively infrequently, no data has been recorded on their reactions to sonic booms. At the NCI, harbor seals have been observed to respond at higher rates to sonic booms than other species present there (Table 7). California sea lions have also sometimes shown reactiveness to sonic booms, with pups sometimes reacting

more than adults, (Table 7). Northern fur seals generally show little or no reaction. Northern elephant seals generally exhibit no reaction at all, except perhaps a heads-up response or some stirring, especially if sea lions in the same area or mingled with the elephant seals react strongly to the boom. Post-launch monitoring generally reveals a return to normal patterns within minutes up to an hour or two of each launch, regardless of species (SAIC 2012).

Monitoring data also show that reactions to sonic booms tend to be insignificant below 1.0 psf and that, even above 1.0 psf, only a portion of the animals present have reacted to the sonic boom depending on the species. Lower energy sonic booms (< 1.0 psf) have typically resulted in little to no behavioral responses, including head raising and briefly alerting but returning to normal behavior shortly after the stimulus (Table 7). More powerful sonic booms have sometimes resulted in some species of pinnipeds flushing from haulouts.

TABLE 7—OBSERVED PINNIPED RESPONSES TO SONIC BOOMS AT SAN MIGUEL ISLAND, BASED ON USAF LAUNCH MONITORING REPORTS

Launch event	Sonic boom level (psf)	Monitoring location	Species observed and responses
Athena II (April 27, 1999)	1.0	Adams Cove	California sea lion: 866 alerted; 232 (27%) flushed into water. Northern elephant seal: alerted but did not flush. Northern fur seal: alerted but did not flush.
Athena II (September 24, 1999)	0.95	Point Bennett	California sea lion: 12 of 600 (2%) flushed into water. Northern elephant seal: alerted but did not flush. Northern fur seal: alerted but did not flush.
Delta II 20 (November 20, 2000)	0.4	Point Bennett	California sea lion: 60 pups flushed into water; no reaction from focal group. Northern elephant seal: no reaction.
Atlas II (September 8, 2001)	0.75	Cardwell Point	California sea lion (Group 1): no reaction (1,200 animals). California sea lion (Group 2): no reaction (247 animals). Northern elephant seal: no reaction. Harbor seal: 2 of 4 flushed into water.
Delta II (February 11, 2002)	0.64	Point Bennett	California sea lions and northern fur seals: no reaction among 485 animals in 3 groups. Northern elephant seal: no reaction among 424 animals in 2 groups.
Atlas II (December 2, 2003)	0.88	Point Bennett	California sea lion: approximately 40% alerted; several flushed to water (number unknown—night launch). Northern elephant seal: no reaction.
Delta II (July 15, 2004)	1.34	Adams Cove	California sea lion: 10% alerted (number unknown—night launch).
Atlas V (March 13, 2008)	1.24	Cardwell Point	Northern elephant seal: no reaction (109 pups).
Delta II (May 5, 2009)	0.76	West of Judith Rock	California sea lion: no reaction (784 animals).
Atlas V (April 14, 2011)	1.01	Cuyler Harbor	Northern elephant seal: no reaction (445 animals).
Atlas V (September 13, 2012)	2.10	Cardwell Point	California sea lion: no reaction (460 animals). Northern elephant seal: no reaction (68 animals). Harbor seal: 20 of 36 (56%) flushed into water.
Atlas V (April 3, 2014)	0.74	Cardwell Point	Harbor seal: 1 of ~25 flushed into water; no reaction from others.
Atlas V (December 12, 2014)	1.18	Point Bennett	Calif. sea lion: 5 of ~225 alerted; none flushed.
Atlas V (October 8, 2015)	1.96	East Adams Cove of Point Bennett.	Calif. sea lion: ~60% of CSL alerted and raised their heads. None flushed. Northern elephant seal: No visible response to sonic boom, none flushed. Northern fur seal: 60% alerted and raised their heads. None flushed.
Atlas V (March 1, 2017)	[a] ~0.8	Cuyler Harbor on San Miguel Island.	Northern elephant seal: 13 of 235 (6%) alerted; none flushed.

[a] Peak sonic boom at the monitoring site was ~2.2 psf, but was in infrasonic range—not audible to pinnipeds. Within the audible frequency spectrum, boom at monitoring site estimated at ~0.8 psf.

Monitoring data also suggests that, for those pinnipeds that flush from haulouts in response to sonic booms, the amount of time it takes those animals to begin returning to the haulout site and for numbers of animals to return to pre-launch levels is correlated with sonic boom levels. Pinnipeds may begin to return to the haulout site within 2–55 minutes of the launch disturbance, and the haulout site usually returned to pre-launch levels within 45–120 minutes. Monitoring data from launch of the Athena IKONOS rocket in 2012 showed harbor seals that flushed to the water on exposure to the sonic boom at SMI began to return to the haulout approximately 16–55 minutes post-launch (Thorson *et al.,* 1999). Monitoring data from the launch of the Delta IV in 2012 showed harbor seals that flushed to the water at VAFB in response to the launch noise returned to the haulout approximately 30 minutes later (ManTech SRS Technologies, 2012).

Based on two decades of monitoring reports, pinniped responses to sonic booms range from no response, to head raises and movements in response to the stimuli, to flushing to the water. Injury and mortality are not expected to result from exposure to sonic booms and this

is supported by two decades of monitoring reports which have shown no documented pinniped mortalities or serious associated with sonic booms, and no pup abandonment as a result of sonic booms. No sustained decreases in numbers of animals observed at haulouts have been observed after the stimulus. These findings came as a result of more than two decades of research by numerous qualified, independent researchers, from 1991 through 2018. These patterns are anticipated to continue.

Launch Noise

Whereas sonic booms represent the primary source of noise on the NCI from the USAF's proposed activities, on VAFB the sound associated with launches represents the primary source of noise from the USAF's proposed activities. The operation of launch vehicle engines produces significant sound levels. Generally, noise is generated from three sources during launches: (1) Combustion noise from launch vehicle chambers; (2) jet noise generated by the interaction of the exhaust jet and the atmosphere; (3) combustion noise from the post-burning of combustion products. Launch noise levels are highly dependent on the type of first-stage booster and the fuel used to propel the vehicle.

Pre- and post-launch pinniped monitoring by marine mammal observers occurs at haulouts near launch sites. Pre- and post-launch data has shown that as many or more animals are typically hauled out after the launch than were present prior to the launch, unless rising tides, breakers or other disturbances are involved (SAIC 2012). When launches occurred during high tides at VAFB, no impacts have been recorded because virtually all haulout sites were submerged. As with sonic booms, observed reactions of pinnipeds at VAFB to launch noise has included startle responses and movements into the water. No pinniped mortalities and no pup abandonment have been documented as a result of launch noise. These patterns are anticipated to continue.

Available monitoring data on pinniped behavior during launches is more limited than pre- and post-launch data as marine mammal observers are not able to access pinniped haulouts near launch sites during launches due to safety concerns. Video monitoring of pinnipeds during launches is not always feasible due to launches occurring in darkness or poor visibility conditions but has been used successfully during a limited number of launches that occurred in daylight and with good visibility conditions. Data from the limited number of launches where video monitoring during launches was successful indicates that all harbor seals and California sea lions have flushed to the water during launches while 10 percent or less of northern elephant seals have flushed to the water during launch. However, it should be noted that available video monitoring data is very limited so it is difficult to draw broad conclusions on responses to launches based on the small sample sizes of available data (*i.e.,* there is only one launch for which video monitoring data is available for California sea lions). We also note that video monitoring during launches is typically conducted at haulouts on VAFB close to the launch location, thus the rate at which pinnipeds respond to launches at haulouts on VAFB that are further away from the launch location remain largely unknown, further complicating our ability to draw conclusions on pinniped response rates during launches.

To determine if harbor seals experience changes in their hearing sensitivity as a result of launch noise, ABR testing was previously conducted on 21 harbor seals during four Titan IV launches, one Taurus launch, and two Delta IV launches by the USAF in accordance with issued scientific research permits. Following standard ABR testing protocol, the ABR was measured from one ear of each seal using sterile, sub-dermal, stainless steel electrodes. A conventional electrode array was used, and low-level white noise was presented to the non-tested ear to reduce any electrical potentials generated by the non-tested ear. A computer was used to produce the click and an 8 kilohertz (kHz) tone burst stimuli, through standard audiometric headphones. Over 1,000 ABR waveforms were collected and averaged per trial. Initially the stimuli were presented at SPLs loud enough to obtain a clean reliable waveform, and then decreased in 10 dB steps until the response was no longer reliably observed. Once response was no longer reliably observed, the stimuli were then increased in 10 dB steps to the original SPL. By obtaining two ABR waveforms at each SPL, it was possible to quantify the variability in the measurements.

Good replicable responses were measured from most of the seals, with waveforms following the expected pattern of an increase in latency and decrease in amplitude of the peaks, as the stimulus level was lowered. One seal had substantial decreased acuity to the 8 kHz tone-burst stimuli prior to the launch. The cause of this hearing loss was unknown but was most likely congenital or from infection. Another seal had a great deal of variability in waveform latencies in response to identical stimuli. This animal moved repeatedly during testing, which may have reduced the sensitivity of the ABR testing on this animal for both the click and 8 kHz tone burst stimuli. Two of the seals were released after pre-launch testing but prior to the launch of the Titan IV B–34, as the launch was delayed for over five days, with five days being the maximum duration permitted to hold the seals for testing.

Detailed analysis of the changes in waveform latency and waveform replication of the ABR measurements for the 14 seals, showed no detectable changes in the seals' hearing sensitivity as a result of exposure to the launch noise. The delayed start (1.75 to 3.5 hr after the launches) for ABR testing allows for the possibility that the seals may have recovered from a temporary threshold shift (TTS) before testing began. However, it can be said with confidence that the post-launch tested animals did not have permanent hearing changes due to exposure to the launch noise from the Titan IV, Taurus, or Delta IV SLVs.

No sustained decreases in numbers of animals observed at haulouts have been observed after launches. No pup abandonment has been documented as a result of launch noise and no documented pinniped mortalities have been associated with launch noise on VAFB. These patterns are expected to continue.

Aircraft and Helicopter Operations

The USAF does not monitor pinniped responses to aircraft and helicopter operations, including UAS operations, on VAFB. As described above, except for take-off and landing actions, a minimum altitude of 300 feet will be maintained for Class 0–2 UAS over all known marine mammal haulouts when marine mammals are present. Class 3 UAS will maintain a minimum altitude of 500 feet, except at take-off and landing. No Class 4 or 5 UAS will be flown below 1,000 feet over haulouts. The available literature indicates that harassment of hauled out pinnipeds, as a result of visual or auditory stimuli, from Class 0–2 UAS is unlikely to occur at altitudes of 300 feet and above (Erbe *et al.,* 2017; Pomeroy *et al.,* 2015; Sweeney *et al.,* 2016; Sweeney and Gelatt, 2017). Information on pinniped responses to larger UASs, including Class 3 UASs, is not available. However, based on the specifications of Class 3 UASs (Table 5), the likelihood of marine mammal harassment resulting from overflights by UASs of that size would

likely depend on several factors including noise signature and means of propulsion (*i.e.,* rocket propelled or engine propelled). The specifications for potential Class 3 UASs that would be used by USAF are not known at this time as this is a relatively new activity at VAFB and as UAS technology is changing rapidly it is difficult for the USAF to predict which types of UAS will be used between 2019 and 2024. While unlikely, it is possible that take of marine mammals could occur as a result of Class 3 UASs flown at 500 feet or above, depending on noise signature and means of propulsion of the UAS. In addition, occasional helicopter and aircraft operations involving search-and-rescue missions, delivery of space vehicle components, launch mission support, security reconnaissance, and training flights occur at VAFB and have the potential to result in harassment of hauled out pinnipeds. While monitoring data is not available, we anticipate that pinniped responses to aircraft and helicopter operations will be similar to those exhibited in response to sonic booms and launch noise (*i.e.,* some head raises, movements in response to the stimulus, and possibly flushing to the water).

Anticipated Effects on Marine Mammal Habitat

Impacts on marine mammal habitat are part of the consideration in making a finding of negligible impact on the species and stocks of marine mammals. Habitat includes, but is not necessarily limited to, rookeries, mating grounds, feeding areas, and areas of similar significance. We do not anticipate that the proposed operations would result in any temporary or permanent effects on the habitats used by the marine mammals in the proposed area, including the food sources they use (*i.e.* fish and invertebrates). While it is anticipated that the specified activity may result in marine mammals avoiding certain areas due to temporary ensonification, this impact to habitat is temporary and reversible and was considered in further detail earlier in this document, as behavioral modification. The main impact associated with the proposed activity will be temporarily elevated noise levels and the associated direct effects on marine mammals, previously discussed in this proposed rule.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this proposed rule, which will inform both NMFS' consideration of ''small numbers'' and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as: Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to sounds associated with the planned activities. Based on the nature of the activity, Level A harassment is neither anticipated nor proposed to be authorized.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimate.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment). Thresholds have also been developed identifying the received level of in-air sound above which exposed pinnipeds would likely be behaviorally harassed.

Level B Harassment for non-explosive sources—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. For in-air sounds, NMFS predicts that harbor seals exposed above received levels of 90 dB re 20 µPa (rms) will be behaviorally harassed, and other pinnipeds will be harassed when exposed above 100 dB re 20 µPa (rms) (Table 8).

TABLE 8—NMFS CRITERIA FOR PINNIPED HARASSMENT FROM EXPOSURE TO AIRBORNE SOUND

Species	Level B harassment threshold
Harbor seals	90 dB re 20 µPa.
All other pinniped species	100 dB re 20 µPa.

In the absence of site-specific data, NMFS typically relies on the acoustic criteria shown in Table 8 to estimate take as a result of exposure to airborne sound. However, in this case, more than 20 years of monitoring data exists on pinniped responses to the stimuli associated with the proposed activities in the particular geographic area of the proposed activities. Therefore, we consider these data to be the best available information in regard to estimating take of pinnipeds to stimuli associated with the proposed activities. These data suggest that pinniped responses to the stimuli associated with the proposed activities are dependent on species and intensity of the stimuli.

The data recorded by USAF at VAFB and the NCI over the past 20 years has shown that pinniped reactions to sonic booms and launch noise vary depending on the species, the intensity of the stimulus, and the location (*i.e.,* on VAFB or the NCI). At the NCI, harbor seals have tended to react more strongly to sonic booms than most other species, with California sea lions also appearing to be somewhat more sensitive to sonic booms than some other pinniped

species (Table 7). Northern fur seals generally show little or no reaction, and northern elephant seals generally exhibit no reaction at all, except perhaps a heads-up response or some stirring, especially if sea lions in the same area mingled with the elephant seals react strongly to the boom (Table 7). No data is available on Steller sea lion or Guadalupe fur seal responses to sonic booms. There is less data available on pinniped responses during launches, but the available data indicates that all harbor seals and California sea lions have tended to flush to the water during launches while 10 percent or less of northern elephant seals have flushed to the water during launch.

Ensonified Area

The USAF is not able to predict the exact areas that will be impacted by noise associated with the specified activities, including sonic booms, launch noise and aircraft noise. Numerous launch locations are utilized on VAFB, each of which results in different parts of the base (and different haulouts) being ensonified by launch noise during launches. Different space launch vehicles have varying trajectories which result in different sonic boom ''footprints'', which are likely to impact different areas on the NCI. In addition, rocket launches by private entities on VAFB are expected to increase over the next 5 years and the USAF is not able to predict the trajectories of these future rocket launch programs. Therefore, for the purposes of estimating take, we conservatively estimate that all haulouts on VAFB will be ensonified by launch noise during a rocket or missile launch. On the NCI, sonic booms from launches sometimes impact San Miguel Island (SMI) and occasionally Santa Rosa Island (SRI); Santa Cruz and Anacapa Islands are not expected to be impacted by sonic booms in excess of 1.0 psf (USAF, 2018) therefore only marine mammals on San Miguel and Santa Rosa Islands may potentially be taken by sonic booms. We estimate that, when a sonic boom impacts the NCI, 25 percent of pinniped haulouts on San Miguel and Santa Rosa Islands will be ensonified by a sonic boom above 1.0 psf. We consider this to be a conservative assumption based on sonic boom models which show that areas predicted to be impacted by a sonic boom with peak overpressures of 1.0 psf and above are typically limited to isolated parts of a single island, and sonic boom model results tend to overestimate actual recorded sonic booms on the NCI (pers. comm. R. Evans, USAF, to J. Carduner, NMFS OPR).

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Data collected from marine mammal surveys, including monthly marine mammal surveys conducted by the USAF at VAFB as well as data collected by NMFS at NCI, represent the best available information on the occurrence of the six pinniped species expected to occur in the project area. Monthly marine mammal surveys at VAFB are conducted to document the abundance, distribution and status of pinnipeds at VAFB. When possible, these surveys are timed to coincide with the lowest afternoon tides of each month, when the greatest numbers of animals are usually hauled out. Data gathered during monthly surveys include: Species, number, general behavior, presence of pups, age class, gender, reactions to natural or human-caused disturbances, and environmental conditions. The quality and amount of information available on pinnipeds in the project area varies depending on species; some species are surveyed regularly at VAFB and the NCI (*e.g.,* California sea lion), while other species are surveyed less frequently (*e.g.,* northern fur seals and Guadalupe fur seals). However, the best available data was used to estimate take numbers. Take estimates for all species are shown in Table 13.

Harbor Seal—Pacific harbor seals are the most common marine mammal inhabiting VAFB, congregating on several rocky haulout sites along the VAFB coastline. They also haul out, breed, and pup in isolated beaches and coves throughout the coasts of the NCI. Data from VAFB monthly surveys for the three most recent years for which data is available (2015, 2016 and 2017) shows the mean number of harbor seals recorded on VAFB during those years was 255 (CEMML 2016, 2017, 2018). The USAF estimated the number of harbor seals that may be hauled out at VAFB during all months of the year from 2019–2024 to be 300; we think this is a reasonable estimate given the monthly survey data as described above and the fluctuations in harbor seal numbers observed on VAFB; therefore, take of harbor seals at VAFB was estimated based on a conservative estimate of 300 harbor seals hauled out during any month on VAFB. Take of harbor seals at the NCI was estimated based on the mean count totals from survey data collected on SMI, SRI, and Richardson Rock (located 10 km northwest of SMI), from 2011 to 2015 by the NMFS SWFSC (Lowry *et al.,* 2017).

California sea lion—California sea lions are common offshore of VAFB and haul out on rocks and beaches along the coastline of VAFB where their numbers have been increasing in recent years, though pupping rarely occurs on the VAFB coastline. They haul out in large numbers on the NCI and rookeries exist on SMI. The data from monthly marine mammal surveys at VAFB from 2015, 2016 and 2017 shows a mean of 11 California sea lions recorded at VAFB (CEMML 2016, 2017, 2018). However, numbers of California sea lions appear to be increasing at VAFB, with a mean of 21 recorded during surveys in 2017 including 68 recorded in September 2017 (CEMML, 2018). The USAF estimated in their application that up to 125 California sea lions may be hauled out at VAFB during any month of the year; however, based on the monthly survey data, for the purposes of estimating take we conservatively estimate that up to 75 California sea lions may be hauled out during any month of the year. Take of California sea lions at the NCI was estimated based on the mean count totals from survey data collected on SMI, SRI, and Richardson Rock from 2011 to 2015 by the NMFS SWFSC (Lowry *et al.,* 2017).

Steller Sea Lion—Steller sea lions occur in very small numbers at VAFB and on SMI. They do not currently have rookeries at VAFB or the NCI. Data from monthly marine mammal surveys at VAFB from 2015, 2016 and 2017 show a mean of 2.4 Steller sea lions recorded at VAFB (CEMML 2016, 2017, 2018). The USAF estimated the number of Steller sea lions that may be hauled out at VAFB during all months of the year from 2019–2024 to be 3. We consider this a reasonable estimate based on monthly survey data. Steller sea lions haul out in very small numbers on SMI, and comprehensive survey data for Steller sea lions in the NCI is not available. Take of Steller sea lions on the NCI was estimated based on subject matter expert input indicating that a maximum of 4 Steller sea lions have been observed on SMI at any time (pers. comm., S. Melin, NMFS Marine Mammal Laboratory (MML), to J. Carduner, NMFS OPR).

Northern elephant seal—Northern elephant seals haul out sporadically on rocks and beaches along the coastline of VAFB and at Point Conception and have rookeries on SMI and SRI and at one location at VAFB. Data from monthly marine mammal surveys at VAFB from 2015, 2016 and 2017 show a mean of 39.4 northern elephant seals recorded at VAFB (CEMML 2016, 2017, 2018). The USAF estimated the number of northern elephant seals that may be hauled out at

VAFB during all months of the year from 2019–2024 to be 60. However, a mean of 76.3 northern elephant seals was recorded at VAFB in 2017 (CEMML, 2018), suggesting northern elephant seal numbers at VAFB may be increasing. For the purposes of estimating take on VAFB, we therefore conservatively estimate that the number of northern elephant seals that may be hauled out at VAFB during all months of the year from 2019–2024 to be 100. Take of northern elephant seals at the NCI was estimated based on the mean count totals from survey data collected on SMI, SRI, and Richardson Rock from 2011 to 2015 by the NMFS SWFSC (Lowry et al., 2017).

Northern fur seal—Northern fur seals have rookeries on SMI, the only island in the NCI on which they have been observed. No haulouts or rookeries exist for northern fur seals on the mainland coast, including VAFB, therefore no take of northern fur seals is expected at VAFB. Comprehensive survey data for northern fur seals in the project area is not available. Estimated take of northern fur seals was therefore based on subject matter expert input which indicated that from June through August, the population at SMI is at its maximum, with an estimated 13,384 animals at SMI (Carretta et al., 2015), with approximately 7,000 present from September through November, and approximately 125 present from November through May (pers. comm., S. Melin, NMFS Marine Mammal Laboratory (MML) to J. Carduner, NMFS OPR).

Guadalupe fur seal—There are estimated to be approximately 20–25 individual Guadalupe fur seals that have fidelity to San Miguel Island (pers. comm. S. Melin, NMFS MML, to J. Carduner, NMFS OPR). No haulouts or rookeries exist for Guadalupe fur seals on the mainland coast, including VAFB, therefore no take of Guadalupe fur seals is expected at VAFB. Survey data on Guadalupe fur seals in the project area is not available. Estimated take of Guadalupe fur seals was based on the maximum number of Guadalupe fur seals observed at any time on SMI (13) (pers. comm., J. LaBonte, ManTech SRS Technologies Inc., to J. Carduner, NMFS, Feb. 29, 2016); it was therefore conservatively assumed that 13 Guadalupe fur seals may be hauled out the NCI at any given time.

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

NMFS currently uses a three-tiered scale to determine whether the response of a pinniped on land to stimuli rises to the level of behavioral harassment under the MMPA (Table 9). NMFS considers the behaviors that meet the definitions of both movements and flushes in Table 9 to qualify as behavioral harassment. Thus a pinniped on land is considered by NMFS to have been behaviorally harassed if it moves greater than two times its body length, or if the animal is already moving and changes direction and/or speed, or if the animal flushes from land into the water. Animals that become alert without such movements are not considered harassed. See Table 9 for a summary of the pinniped disturbance scale.

TABLE 9—LEVELS OF PINNIPED BEHAVIORAL DISTURBANCE ON LAND

Level	Type of response	Definition	Characterized as behavioral harassment by NMFS
1	Alert	Seal head orientation or brief movement in response to disturbance, which may include turning head towards the disturbance, craning head and neck while holding the body rigid in a u-shaped position, changing from a lying to a sitting position, or brief movement of less than twice the animal's body length.	No.
2	Movement	Movements in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degrees.	Yes.
3	Flush	All retreats (flushes) to the water	Yes.

Take estimates were calculated separately for each stock in each year the proposed regulations would be valid (from 2019–2024), on both VAFB and the NCI, based on the number of animals assumed hauled out at each location that are expected to be behaviorally harassed by the stimuli associated with the specified activities (*i.e.,* launch, sonic boom, or aircraft noise). First, the number of hauled out animals per month was estimated at both VAFB and the NCI for each stock, based on survey data and subject matter expert input as described above. Then we estimated the number of hauled out animals per month that would be behaviorally harassed, by applying a correction factor to account for the likelihood that the animals would respond at a Level 2 or 3 response (Table 9). Those correction factors differ depending on the location (*i.e.* VAFB or the NCI) and on the reactiveness of each species to the stimuli (Table 10), and are based on the best available information (in this case, several years of monitoring data on both VAFB and the NCI (Table 7)).

TABLE 10—PROPORTION OF EACH SPECIES ASSUMED TO BE HARASSED BY LAUNCH OR SONIC BOOM ON VAFB AND THE NCI

Species (stock)	Proportion of individuals assumed taken per sonic boom (NCI) (percent)	Proportion of individuals assumed taken per launch (VAFB) (percent)
Harbor seal (CA)	50	100

TABLE 10—PROPORTION OF EACH SPECIES ASSUMED TO BE HARASSED BY LAUNCH OR SONIC BOOM ON VAFB AND THE NCI—Continued

Species (stock)	Proportion of individuals assumed taken per sonic boom (NCI) (percent)	Proportion of individuals assumed taken per launch (VAFB) (percent)
CA sea lion (US)	25	100
NES (CA breeding)	5	15
Steller Sea Lion (Eastern)	50	100
Northern fur seal (CA)	25	(n/a)
Guadalupe fur seal (Mexico)	50	(n/a)

As described above, for pinnipeds on VAFB, we conservatively assumed that all pinnipeds at all haulouts would be impacted by launch noise. This is a conservative assumption, as some haulouts are separated by several miles from launch locations, and presumably pinnipeds at haulouts further from the launch location would not react at the same rates as those located near the launch. For pinnipeds on the NCI, as described above we conservatively assume that 25% of haulouts would be impacted by a sonic boom with a psf above 1.0, if such a sonic boom were to impact the NCI (not all launches result in sonic booms on the NCI). Thus, for pinnipeds on the NCI, an additional .25 correction factor was applied to the take estimate, to account for the fact that approximately 25 percent of haulouts on the NCI are expected to be impacted by a sonic boom with a psf above 1.0, if such a sonic boom were to impact the NCI, while for launches on VAFB, we conservatively assume all pinnipeds will be exposed to launch noise. Take was calculated monthly, as abundance estimates for some species vary on VAFB and the NCI depending on season.

The resulting numbers were then multiplied by the number of activities (sonic booms or launches) estimated to occur in a month, and then summed to get total numbers of each stock estimated to be taken at each location per year. The USAF provided estimates of rocket and missile launches anticipated per year (Table 1), and the number of sonic booms above 1.0 psf estimated to impact the NCI per year (Table 2). Thus for pinnipeds on VAFB, the number of launches estimated per year was used to estimate take in each year (*e.g.,* in 2023, the USAF expects 100 rocket and 15 missile launches will occur, thus 115 launches was used to estimate takes on VAFB in 2023). For pinnipeds on the NCI, the number of sonic booms above 1.0 psf estimated per year was used to estimate take in each year (*e.g.,* in 2023, the USAF expects 19 sonic booms above 1.0 to impact the NCI, thus 19 sonic booms was used to estimate takes on the NCI in 2023). Note that the proposed rule would only be valid for 3 months in the year 2024, thus the highest number of launches and sonic booms anticipated to occur in any single year during the period of validity for the proposed rule would be in 2023, despite the fact that more launches are anticipated to occur in calendar year 2024.

Monitoring data on pinniped responses to aircraft, helicopter and UAS related stimuli is not available. The USAF estimated that 3,000 instances of harbor seal harassment and 500 instances of California sea lion harassment would occur over the 5 years that the proposed regulations would be valid, thus we divided those numbers (3,000 instances of harbor seal harassment and 500 instances of California sea lion harassment) by 5 to estimate the numbers of take per year and we propose to authorize the numbers shown in Table 11.

The numbers of incidental take expected to occur on VAFB as a result of the specified activities is shown in Table 11. The numbers of incidental take expected to occur on the NCI as a result of the specified activities is shown in Table 12. The total numbers of incidental take expected to occur and proposed for authorization are shown in Table 13. The take estimates presented in Tables 11, 12 and 13 are based on the best available information on marine mammal populations in the project location and responses among marine mammals to the stimuli associated with the proposed activities and are considered conservative.

TABLE 11—ESTIMATED NUMBERS OF MARINE MAMMALS TAKEN ON VAFB PER YEAR, AS A RESULT OF ROCKET AND MISSILE LAUNCHES AND AIRCRAFT OPERATIONS

Species (stock)	2019		2020		2021		2022		2023		2024*	
	Launches	Aircraft	Launches	Aircraft	Launches	Aircraft	Launches	Aircraft	Launches	Aircraft	Launches	Aircraft
Harbor seal (CA)	9,000	600	11,250	600	14,625	600	20,250	600	34,500	600	7,031	600
CA sea lion (US)	3,000	100	3,750	100	4,875	100	6,750	100	8,625	100	2,344	100
NES (CA breeding)	600	0	750	0	975	0	1,350	0	1,725	0	469	0
Steller Sea Lion (Eastern)	120	0	150	0	195	0	270	0	345	0	94	0
Northern fur seal (CA)	0	0	0	0	0	0	0	0	0	0	0	0
Guadalupe fur seal (Mexico)	0	0	0	0	0	0	0	0	0	0	0	0

*Based on launches and aircraft operations occurring during the period of validity for the proposed rule (January through March only in 2024).

TABLE 12—ESTIMATED NUMBERS OF MARINE MAMMALS TAKEN ON THE NCI PER YEAR

Species (stock)	2019	2020	2021	2022	2023	2024
Harbor seal (CA)	523	732	1,151	1,464	1,987	523
CA sea lion (US)	17,705	24,787	38,951	49,573	67,278	16,419
NES (CA breeding)	2,412	3,377	5,306	6,754	9,165	4,516
Steller Sea Lion (Eastern)	10	14	22	28	38	10
Northern fur seal (CA)	850	1,190	1,870	2,380	3,231	23
Guadalupe fur seal (Mexico)	33	46	72	91	124	33

*Based on sonic booms occurring during the period of validity for the proposed rule (January through March only in 2024).

TABLE 13—TOTAL ESTIMATED NUMBERS OF MARINE MAMMALS, AND PERCENTAGE OF MARINE MAMMAL POPULATIONS, POTENTIALLY TAKEN AS A RESULT OF THE PROPOSED ACTIVITIES

Species (stock)	2019	2020	2021	2022	2023	2024 [1]	Highest total take over a single year	Stock abundance	Percentage of stock taken [2]
Harbor seal (CA)	10,123	12,582	16,376	22,314	37,087	8,154	37,087	30,968	[3] 7.1
CA sea lion (US)	20,805	28,637	43,926	56,423	76,003	18,863	76,003	257,606	29.5
NES (CA breeding)	3,012	4,127	6,281	8,104	10,890	4,985	10,890	179,000	6.1
Steller Sea Lion (Eastern)	130	164	217	298	383	104	383	52,139	0.7
Northern fur seal (CA)	850	1,190	1,870	2,380	3,231	23	3,231	14,050	23.0
Guadalupe fur seal (Mexico)	33	46	72	91	124	33	124	20,000	0.6

[1] Take numbers shown reflect only the takes that would occur during the period of validity for the proposed rule (January through March only in 2024).
[2] As numbers of take proposed for authorization vary by year, the estimates shown for percentages of stock taken are based on takes proposed for authorization in 2023 which has the highest take numbers proposed for authorization in any single year.
[3] Take totals shown for harbor seals reflect the number of instances of harassment proposed for authorization, however, for purposes of determining the percent of stock taken we use the number of individual animals estimated to be taken (2,188 per year). See further explanation in the section on ''small numbers'' below.

Proposed Mitigation

Under Section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (''least practicable adverse impact''). NMFS does not have a regulatory definition for ''least practicable adverse impact.'' However, NMFS's implementing regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, implementation of the measure(s) is expected to reduce impacts to marine mammal species or stocks, their habitat, and their availability for subsistence uses. This analysis will consider such things as the nature of the potential adverse impact (such as likelihood, scope, and range), the likelihood that the measure will be effective if implemented, and the likelihood of successful implementation.

(2) The practicability of the measure for applicant implementation. Practicability of implementation may consider such things as cost, impact on operations, personnel safety, and practicality of implementation.

Launch Mitigation

For missile and rocket launches, unless constrained by other factors (including, but not limited to, human safety, national security concerns or launch trajectories), launches will be scheduled to avoid the harbor seal pupping season (*e.g.,* March through June) when feasible. The USAF would also avoid, whenever possible, launches which are predicted to produce a sonic boom on the NCI during the harbor seal pupping season (*e.g.,* March through June).

Aircraft Operation Mitigation

All aircraft and helicopter flight paths must maintain a minimum distance of 1,000 ft (305 m) from recognized seal haulouts and rookeries (*e.g.,* Point Sal, Purisima Point, Rocky Point), except in emergencies or for real-time security incidents (*i.e.,* search-and-rescue, fire-fighting) and except for one area near the VAFB harbor over which aircraft may be flown to within 500 ft of a haulout. Except for take-off and landing actions, a minimum altitude of 300 feet will be maintained for Class 0–2 UAS over all known marine mammal haulouts when marine mammals are present. Class 3 will maintain a minimum altitude of 500 feet, except at take-off and landing. A minimum altitude of 1,000 feet will be maintained over haulouts for Class 4 or 5 UAS.

We have carefully evaluated the USAF's proposed mitigation measures and considered a range of other measures in the context of ensuring that we prescribed the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Based on our evaluation of these measures, we have preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for subsistence uses.

Proposed Monitoring and Reporting

In order to issue an LOA for an activity, Section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of the authorized taking. NMFS's MMPA implementing regulations further describe the information that an applicant should provide when

requesting an authorization (50 CFR 216.104(a)(13)), including the means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and the level of taking or impacts on populations of marine mammals.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of significant interactions with marine mammal species in action area (*e.g.,* animals that came close to the vessel, contacted the gear, or are otherwise rare or displaying unusual behavior).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.,* source characterization, propagation, ambient noise); (2) affected species (*e.g.,* life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.,* age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.,* marine mammal prey species, acoustic habitat, or important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

The USAF has proposed a suite of monitoring measures on both VAFB and the NCI to document impacts of the specified activities on marine mammals. These proposed monitoring measures are described below.

Monitoring at VAFB

Monitoring requirements for launches and landings at VAFB would be dependent on the season and on the type of rocket or missile being launched (or landed in the case of the Falcon 9) (Table 14). Acoustic and biological monitoring at VAFB would be required for all rocket types during the harbor seal and elephant seal pupping seasons at VAFB (*e.g.,* January 1 through July 31) to ensure that responses of pups to the specified activities are monitored and recorded. Acoustic and biological monitoring at VAFB would also be required for all launches of any space launch vehicle types that have not been previously monitored three times, for any space launch vehicle types that have been previously monitored but for which the launch is predicted to be louder than previous launches of that rocket type (based on modeling by USAF) and, for new types of missiles, regardless of the time of year. Falcon 9 First Stage recovery activities (*i.e.,* boost-back and landings) with sonic booms that have a predicted psf of >1.0 on VAFB (based on sonic boom modeling performed prior to launch) would be monitored at VAFB, at any time of year.

TABLE 14—PROPOSED MONITORING MEASURES AT VAFB

Dates	Monitoring requirement on VAFB
Year round	• Launches of new space launch vehicles that have not been monitored 3 previous times. • Launches of existing space launch vehicles that are expected to be louder than previous launches of the same vehicle type. • Launches of new types of missiles that have not been monitored 3 previous times. • Falcon 9 First Stage recoveries with a predicted psf of >1.0 on VAFB.
Jan 1–July 31	• Launches of all space launch vehicles.

Marine mammal monitoring at VAFB must be conducted by at least one NMFS-approved marine mammal observer trained in marine mammal science. Authorized marine mammal observers must have demonstrated proficiency in the identification of all age and sex classes of both common and uncommon pinniped species found at VAFB and must be knowledgeable of approved count methodology and have experience in observing pinniped behavior, especially in response to human disturbances.

Monitoring at the haulout site closest to the facility where the space launch vehicle will be launched would begin at least 72 hours prior to the launch and would continue until at least 48 hours after the launch. Monitoring for each launch would include multiple surveys during each day of monitoring (typically between 4–6 surveys per day) that would record: Species, number, general behavior, presence of pups, age class, gender, and reaction to launch noise, or to natural or other human-caused disturbances. Environmental conditions would also be recorded, including: Visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

For launches that occur during the elephant seal and harbor seal pupping seasons (January 1 through July 31) a follow-up survey would be conducted within two weeks of the launch to monitor for any potential adverse impacts to pups. For launches that occur during daylight, time-lapse photo and/or video recordings would occur during launch, as marine mammal observers are not allowed to be present within the launch area or at haulouts on VAFB at the time of launch for safety reasons. The USAF would also use night video monitoring to record responses of pinnipeds to launches that occur in darkness, if feasible. Night video monitoring may not be practical depending on whether technology is available that can reliably and remotely record responses of pinnipeds at remote haulout locations.

In addition to monitoring pinniped responses to the proposed activities on VAFB, the USAF proposes to continue to conduct monthly marine mammal surveys on VAFB. Monthly surveys have been carried out at VAFB for several years and have provided valuable data on abundance, habitat use, and seasonality of pinnipeds on VAFB. The goals of the monthly surveys include assessing haulout patterns and relative abundance over time, resulting in improved understanding of pinniped population trends at VAFB and better enabling assessment of potential long-term impacts of USAF operations. When possible, these surveys would be timed to coincide with the lowest afternoon tides of each month, when the greatest numbers of animals are typically hauled out. During the monthly surveys, a NMFS-approved observer would record: Species, number, general behavior, presence of pups, age class, gender, and any reactions to natural or human-caused disturbances. Environmental conditions would also be recorded,

including: Visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

Monitoring at the NCI

As described previously, sonic booms are the only stimuli associated with the proposed activities that have the potential to result in harassment of marine mammals on the NCI. As pinniped responses on the NCI are dependent on the species and on the intensity of the sonic boom (Table 7), requirements for monitoring on the NCI would vary by season and would depend on the expected sonic boom level and the pupping seasons of the species expected to be present. Sonic boom modeling would be performed prior to all rocket launches and Falcon 9 recoveries. Acoustic and biological monitoring would be conducted on the NCI if the sonic boom model indicates that pressures from a sonic boom are expected to reach or exceed the levels shown in Table 15. These dates have been determined based on seasons when pups may be present for the species that are most responsive to sonic booms on the NCI based on several years of monitoring data (*e.g.,* harbor seals and California sea lions) (Table 7).

TABLE 15—MONITORING REQUIREMENTS ON THE NORTHERN CHANNEL ISLANDS BY SEASON

Sonic boom level (modeled)	Dates
>2 psf	March 1–July 31.
>3 psf	August 1–September 30.
>4 psf	October 1–February 28.

Marine mammal monitoring would be conducted at the closest significant haulout site to the modeled sonic boom impact area. The monitoring site would be selected based upon the model results, with emphasis placed on selecting a location where the maximum sound pressures are predicted and where pinnipeds are expected to be present that are considered most sensitive in terms of responses to sonic booms. Monitoring the responses of mother-pup pairs of any species would also be prioritized. Given the large numbers of pinnipeds found on some island beaches, smaller focal groups would be monitored. Estimates of the numbers of pinnipeds present on the entire beach would be made and their reactions to the launch noise would be documented. Specialized acoustic instruments would also be used to record sonic booms at the marine mammal monitoring location.

Monitoring would be conducted by at least one NMFS-approved marine mammal observer, trained in marine mammal science. Monitors would be deployed to the monitoring location before, during and after the launch, with monitoring commencing at least 72 hours prior to the launch, occurring during the launch and continuing until 48 hours after the launch (unless no sonic boom is detected by the monitors during the launch and/or by the acoustic recording equipment, at which time monitoring would be discontinued). If the launch occurs in darkness, night vision equipment would be used. The USAF would also conduct video monitoring, including the use of night video monitoring, when feasible (video monitoring is not always practicable due to conditions such as fog, glare, and a lack of animals within view from a single observation point). During the pupping season of any species potentially affected by a sonic boom, a follow-up survey would occur within two weeks of the launch to assess any potential adverse effects on pups.

Monitoring for each launch would include multiple surveys each day that record, when possible: Species, number, general behavior, presence of pups, age class, gender, and reaction to sonic booms or natural or human-caused disturbances. Remarks would be recorded, including the nature and cause of any natural or human-related disturbance, including response to the sonic boom. When flushing behavior is observed, the amount of time it takes for hauled out animals to return to the beach is recorded, if length of recording allows. Environmental conditions would also be recorded, including: Visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

The USAF has complied with the monitoring requirements under the previous LOAs issued from 2013 through 2018.

Reporting

Proposed reporting requirements would include launch monitoring reports submitted after each launch and annual reports describing all activities conducted at VAFB that are covered under this proposed rule during each year.

A launch monitoring report containing the following information would be submitted to NMFS within 90 days after each rocket launch: Species present, number(s), general behavior, presence of pups, age class, gender, numbers of pinnipeds present on the haulout prior to commencement of the launch, numbers of pinnipeds that responded at a level that would be considered harassment (based on the description of responses in Table 9), length of time(s) pinnipeds remained off the haulout (for pinnipeds that flushed), and any behavioral responses by pinnipeds that were likely in response to the specified activities, including in response to launch noise or sonic boom. Launch reports would also include date(s) and time(s) of each launch (and sonic boom, if applicable); date(s) and location(s) of marine mammal monitoring, and environmental conditions including: Visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction. If a dead or seriously injured pinniped is found during post-launch monitoring, the incident must be reported to the NMFS Office of Protected Resources and the NMFS West Coast Regional Office immediately. Results of acoustic monitoring, including the recorded sound levels associated with the launch and/or sonic boom (if applicable) would also be included in the report.

An annual report would be submitted to NMFS on March 1 of each year that would summarize the data reported in all launch reports for the previous calendar year (as described above) including a summary of documented numbers of instances of harassment incidental to the specified activities. Annual reports would also describe any documented takings incidental to the specified activities not included in the launch reports (*e.g.,* takes incidental to aircraft or helicopter operations).

A final comprehensive report would be submitted to NMFS no later than 180 days prior to expiration of these regulations. This report must summarize the findings made in all previous reports and assess both the impacts at each of the major rookeries and an assessment of any cumulative impacts on marine mammals from the specified activities.

The USAF has complied with the reporting requirements under the previous LOAs issued from 2013 through 2018.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of

recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, the discussion of our analyses applies to all the species listed in Table 6, given that the anticipated effects of this activity on these different marine mammal species are expected to be similar. Activities associated with the proposed activities, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from airborne sounds of rocket launches and sonic booms and from sounds or visual stimuli associated with aircraft. Based on the best available information, including monitoring reports from similar activities that have been authorized by NMFS, behavioral responses will likely be limited to reactions such as alerting to the noise, with some animals possibly moving toward or entering the water, depending on the species and the intensity of the sonic boom or launch noise. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated instances of Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in fitness to those individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment would be reduced to the level of least practicable adverse impact through use of mitigation measures described above.

If a marine mammal responds to a stimulus by changing its behavior (*e.g.,* through relatively minor changes in locomotion direction/speed), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals or on the stock or species could potentially be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007). Flushing of pinnipeds into the water has the potential to result in mother-pup separation, or could result in a stampede, either of which could potentially result in serious injury or mortality. However, based on the best available information, including reports from over 20 years of launch monitoring at VAFB and the NCI, no serious injury or mortality of marine mammals is anticipated as a result of the proposed activities.

Even in the instances of pinnipeds being behaviorally disturbed by sonic booms from rocket launches at VAFB, no evidence has been presented of abnormal behavior, injuries or mortalities, or pup abandonment as a result of sonic booms (SAIC 2013, CEMML 2018). These findings came as a result of more than two decades of surveys at VAFB and the NCI (MMCG and SAIC, 2012). Post-launch monitoring generally reveals a return to normal behavioral patterns within minutes up to an hour or two of each launch, regardless of species. For instance, a total of eight Delta II and Taurus space vehicle launches occurred from north VAFB, near the Spur Road and Purisima Point haulout sites, from February, 2009 through February, 2014. Of these eight launches, three occurred during the harbor seal pupping season. The continued use by harbor seals of the Spur Road and Purisima Point haulout sites indicates that it is unlikely that these rocket launches (and associated sonic booms) resulted in long-term disturbances of pinnipeds using the haulout sites. San Miguel Island represents the most important pinniped rookery in the lower 48 states, and as such extensive research has been conducted there for decades. From this research, as well as stock assessment reports, it is clear that VAFB operations (including associated sonic booms) have not had any significant impacts on the numbers of animals observed at San Miguel Island rookeries and haulouts (SAIC 2012). The number of California sea lions documented on VAFB via monthly marine mammal surveys increased substantially in 2017 compared to the numbers recorded in previous years, and northern elephant seal pupping was documented on VAFB for the first time in 2017, providing further evidence that the proposed activities, which are ongoing, have not negatively impacted annual rates of recruitment or survival.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No injury, serious injury, or mortality are anticipated or authorized;
- The anticipated incidences of Level B harassment are expected to consist of, at worst, temporary modifications in behavior (*i.e.,* short distance movements and occasional flushing into the water with return to haulouts within approximately 90 minutes), which are not expected to adversely affect the fitness of any individuals;
- The proposed activities are expected to result in no long-term changes in the use by pinnipeds of rookeries and haulouts in the project area, based on over 20 years of monitoring data; and
- The presumed efficacy of planned mitigation measures in reducing the effects of the specified activity to the level of least practicable adverse impact.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

See Table 13 for information relating to this small numbers analysis (*i.e.,* numbers of take proposed for authorization on an annual basis). We propose to authorize incidental take of 6 marine mammal stocks. The amount of taking proposed for authorization on an annual basis is less than one-third of the most appropriate abundance estimate for five of these species or stocks; therefore, the numbers of take proposed for authorization would be considered small relative to those relevant stocks or populations.

The estimated taking for harbor seals comprises greater than one-third of the best available stock abundance. However, due to the nature of the specified activity—launch activities occurring at specific locations, rather than a mobile activity occurring throughout the stock range—the available information shows that only a portion of the stock would likely be impacted. It is important to note that the number of expected takes does not necessarily represent the number of individual animals expected to be taken, and that our small numbers analysis accounts for this fact. Multiple exposures to Level B harassment can accrue to the same individual animals over the course of an activity that occurs multiple times in the same area (such as the USAF's proposed activity). This is especially likely in the case of species that have limited ranges and that have site fidelity to a location within the project area, as is the case with Pacific harbor seals.

As described above, harbor seals are non-migratory, rarely traveling more than 50 km from their haulout sites. Thus, while the estimated number of annual instances of take may not be considered small relative to the estimated abundance of the California stock of Pacific harbor seals of 30,968 (Carretta *et al.* 2017), a substantially smaller number of individual harbor seals is expected to occur within the project area. We expect that, because of harbor seals' documented site fidelity to haulout locations at VAFB and the NCI, and because of their limited ranges, the same individual harbor seals are likely to be taken repeatedly over the course of the proposed activities. Therefore, the proposed number of instances of Level B harassment that could be authorized for harbor seals per year over the 5-year period of validity of the proposed regulations is expected to accrue to a much smaller number of individual harbor seals encompassing a small portion of the overall stock. Thus, while we propose to authorize the instances of incidental take of harbor seals shown in Table 13, we believe that the number of individual harbor seals that would be incidentally taken by the proposed activities would, in fact, be substantially lower than this number. We base the small numbers determination on the number of individuals taken versus the number of instances of take, as is appropriate when the information is available.

To estimate the number of individual harbor seals expected to be taken by Level B harassment by the proposed activities, we estimated the maximum number of individual harbor seals that could potentially be taken per activity (*i.e.,* launch, landing, or aircraft activity), both on the NCI and at VAFB. As described above, due to harbor seals' limited ranges and site fidelity to haulout locations at VAFB and the NCI, we believe the maximum number of individual harbor seals that could be taken per activity (*i.e.,* launch, landing, or aircraft activity) represents a conservative estimate of the number of individual harbor seals that would be taken over the course of a year. On VAFB, monthly marine mammal surveys conducted by the USAF represent the best available information on harbor seal abundance. The maximum number of harbor seals documented during monthly marine mammal surveys at VAFB in the years 2015, 2016 and 2017 was 821 seals (in October, 2015). On the NCI, marine mammal surveys conducted from 2011–2015 (Lowry et al., 2017) represents the best available information on harbor seal abundance. The maximum number of seals documented in surveys from 2011 through 2015 (the most recent information available) was 1,367 seals (in July, 2015) (Lowry et al., 2017). Therefore, we conservatively estimate that the maximum number of harbor seals that could potentially be taken per activity (*i.e.,* lunch, landing, or aircraft activity) is 2,188 harbor seals, which represents the combined maximum number of seals expected to be present on the NCI and VAFB during any given activity. As we believe the same individuals are likely to be taken repeatedly over the duration of the proposed activities, we use this estimate of 2,188 individual animals taken per activity (*i.e.,* launch, landing, or aircraft activity) for the purposes of estimating the percentage of the stock abundance likely to be taken (7.1 percent).

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Adaptive Management

The regulations governing the take of marine mammals incidental to the USAF's activities at VAFB would contain an adaptive management component.

The reporting requirements associated with this proposed rule are designed to provide NMFS with monitoring data from the previous year to allow consideration of whether any changes are appropriate. The use of adaptive management allows NMFS to consider new information from different sources to determine (with input from the Navy regarding practicability) on an annual or biennial basis if mitigation or monitoring measures should be modified (including additions or deletions). Mitigation measures could be modified if new data suggests that such modifications would have a reasonable likelihood of reducing adverse effects to marine mammals and if the measures are practicable.

The following are some of the possible sources of applicable data to be considered through the adaptive management process: (1) Results from monitoring reports, as required by MMPA authorizations; (2) results from general marine mammal and sound research; and (3) any information which reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOAs.

Endangered Species Act (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of ITAs, NMFS consults internally, in this case with the NMFS West Coast Region Protected Resources Division Office,

whenever we propose to authorize take for endangered or threatened species.

There is one marine mammal species (Guadalupe fur seal) listed under the ESA with confirmed occurrence in the area expected to be impacted by the proposed activities. The Permits and Conservation Division has requested initiation of section 7 consultation with the West Coast Region Protected Resources Division Office for the issuance of this ITA. NMFS will conclude the ESA consultation prior to reaching a determination regarding the proposed issuance of the authorization.

Request for Information

NMFS requests interested persons to submit comments, information, and suggestions concerning the USAF's request and the proposed regulations (see **ADDRESSES**). All comments will be reviewed and evaluated as we prepare a final rule and make final determinations on whether to issue the requested authorization. This proposed rule and referenced documents provide all environmental information relating to our proposed action for public review.

Classification

Pursuant to the procedures established to implement Executive Order 12866, the Office of Management and Budget has determined that this proposed rule is not significant.

Pursuant to section 605(b) of the Regulatory Flexibility Act (RFA), the Chief Counsel for Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The U.S. Air Force is the sole entity that would be subject to the requirements in these proposed regulations, and the U.S. Air Force is not a small governmental jurisdiction, small organization, or small business, as defined by the RFA. Because of this certification, a regulatory flexibility analysis is not required and none has been prepared.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number. However, this rule does not contain a collection-of-information requirement subject to the provisions of the PRA because the applicant is a Federal agency.

List of Subjects in 50 CFR Part 217

Exports, Fish, Imports, Marine mammals, Reporting and recordkeeping requirements, Transportation.

Dated: January 17, 2019.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For reasons set forth in the preamble, 50 CFR part 217 is proposed to be amended as follows:

PART 217—REGULATIONS GOVERNING THE TAKE OF MARINE MAMMALS INCIDENTAL TO SPECIFIED ACTIVITIES

■ 1. The authority citation for part 217 continues to read as follows:

Authority: 16 U.S.C. 1361 *et seq.,* unless otherwise noted.

■ 2. Revise subpart G to read as follows:

Subpart G—Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to U.S. Air Force Launches and Operations at Vandenberg Air Force Base, California

Sec.

§ 217.60 Specified activity and specified geographical region.

(a) Regulations in this subpart apply only to the 30th Space Wing, United States Air Force (USAF) and those persons it authorizes to conduct activities on its behalf for the taking of marine mammals that occurs in the areas outlined in paragraph (b) of this section and that occurs incidental to rocket and missile launches and aircraft and helicopter operations.

(b) The taking of marine mammals by the USAF may be authorized in a Letter of Authorization (LOA) only if it occurs from activities originating at Vandenberg Air Force Base.

§ 217.61 Effective dates.

Regulations in this subpart are effective from [EFFECTIVE DATE OF FINAL RULE], through [DATE 5 YEARS AFTER EFFECTIVE DATE OF FINAL RULE].

§ 217.62 Permissible methods of taking.

Under LOA issued pursuant to §§ 216.106 of this chapter and 217.60 the Holder of the Letter of Authorization (herein after the USAF) may incidentally, but not intentionally, take marine mammals by Level B harassment, within the area described in § 217.60(b), provided the activity is in compliance with all terms, conditions, and requirements of the regulations in this subpart and the appropriate Letter of Authorization.

§ 217.63 Prohibitions.

Notwithstanding takings contemplated in § 217.62 and authorized by a Letter of Authorization issued under §§ 216.106 of this chapter and 217.66, no person in connection with the activities described in § 217.60 may:

(a) Violate, or fail to comply with, the terms, conditions, and requirements of this subpart or a LOA issued under §§ 216.106 and 218.26 of this chapter;

(b) Take any marine mammal not specified in such LOAs;

(c) Take any marine mammal specified in such LOAs in any manner other than as specified;

(d) Take a marine mammal specified in such LOAs if NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammal; or

(e) Take a marine mammal specified in such LOAs if NMFS determines such taking results in an unmitigable adverse impact on the species or stock of such marine mammal for taking for subsistence uses.

§ 217.64 Mitigation.

When conducting the activities identified in § 217.60(a), the mitigation measures contained in any Letter of Authorization issued under §§ 216.106 of this chapter and 217.66 must be implemented. These mitigation measures include (but are not limited to):

(a) For missile and rocket launches, the USAF must avoid, whenever possible, launches during the harbor seal pupping season of March through June, unless constrained by factors including, but not limited to, human safety, national security, or launch mission objectives.

(b) For rocket launches, the USAF must avoid, whenever possible, launches which are predicted to produce a sonic boom on the Northern Channel Islands from March through June.

(c) Aircraft and helicopter flight paths must maintain a minimum distance of 1,000 ft (305 m) from recognized pinniped haulouts and rookeries, whenever possible, except for one area near the VAFB harbor over which

aircraft may be flown to within 500 ft of a haulout, and except in emergencies or for real-time security incidents, which may require approaching pinniped haulouts and rookeries closer than 1,000 ft (305 m).

(d) If post-launch surveys determine that an injurious or lethal take of a marine mammal has occurred, the launch procedure and the monitoring methods must be reviewed, in cooperation with the National Marine Fisheries Service (NMFS), and appropriate changes must be made through modification to a Letter of Authorization, prior to conducting the next launch under that Letter of Authorization.

§ 217.65 Requirements for monitoring and reporting.

(a) To conduct monitoring of rocket launch activities, the USAF must either use video recording, or must designate a qualified on-site individual approved in advance by NMFS, with demonstrated proficiency in the identification of all age and sex classes of both common and uncommon pinniped species found at VAFB and knowledge of approved count methodology and experience in observing pinniped behavior, as specified in the Letter of Authorization, to monitor and document pinniped activity as described in paragraphs (a)(1) through (9) of this section:

(1) For any launches of space launch vehicles or recoveries of the Falcon 9 First Stage occurring from 1 January through 31 July, pinniped activity at VAFB must be monitored in the vicinity of the haulout nearest the launch platform, or, in the absence of pinnipeds at that location, at another nearby haulout, for at least 72 hours prior to any planned launch, and continue for a period of time not less than 48 hours subsequent to the launch;

(2) For any launches of new space launch vehicles that have not been monitored during at least 3 previous launches occurring from 1 August through 31 December, pinniped activity at VAFB must be monitored in the vicinity of the haulout nearest the launch or landing platform, or, in the absence of pinnipeds at that location, at another nearby haulout, for at least 72 hours prior to any planned launch, and continue for a period of time not less than 48 hours subsequent to launching;

(3) For any launches of existing space launch vehicles that are expected to result in louder launch noise or sonic booms than previous launches of the same vehicle type occurring from 1 August through 31 December, pinniped activity at VAFB must be monitored in the vicinity of the haulout nearest the launch or landing platform, or, in the absence of pinnipeds at that location, at another nearby haulout, for at least 72 hours prior to any planned launch, and continue for a period of time not less than 48 hours subsequent to launching;

(4) For any launches of new types of missiles occurring from 1 August through 31 December, pinniped activity at VAFB must be monitored in the vicinity of the haulout nearest the launch or landing platform, or, in the absence of pinnipeds at that location, at another nearby haulout, for at least 72 hours prior to any planned launch, and continue for a period of time not less than 48 hours subsequent to launching;

(5) For any recoveries of the Falcon 9 First Stage occurring from 1 August through 31 December that are predicted to result in a sonic boom of 1.0 psf or above on VAFB, pinniped activity at VAFB must be monitored in the vicinity of the haulout nearest the launch or landing platform, or, in the absence of pinnipeds at that location, at another nearby haulout, for at least 72 hours prior to any planned launch, and continue for a period of time not less than 48 hours subsequent to launching;

(6) For any launches or rocket recoveries occurring from March 1 through July 31), follow-up surveys must be conducted within 2 weeks of the launch;

(7) For any launches or Falcon 9 recoveries, pinniped activity at the Northern Channel Islands must be monitored, if it is determined by modeling that a sonic boom of greater than 2.0 psf is predicted to impact one of the islands between March 1 and July 31, greater than 3.0 psf between August 1 and September 30, and greater than 4.0 psf between October 1 and February 28. Monitoring will be conducted at the haulout site closest to the predicted sonic boom impact area, or, in the absence of pinnipeds at that location, at another nearby haulout;

(8) For any launches or Falcon 9 recoveries during which marine mammal monitoring is required, acoustic measurements must be made of those launch vehicles that have not had sound pressure level measurements documented previously; and

(9) Marine mammal monitoring must include multiple surveys each day that record the species, number of animals, general behavior, presence of pups, age class, gender and reaction to launch noise, sonic booms or other natural or human caused disturbances, in addition to recording environmental conditions such as tide, wind speed, air temperature, and swell.

(b) The USAF must submit a report to the Administrator, West Coast Region, NMFS, and Office of Protected Resources, NMFS, within 90 days after each launch. This report must contain the following information:

(1) Date(s) and time(s) of the launch;

(2) Design of the monitoring program; and

(3) Results of the monitoring program, including, but not necessarily limited to:

(i) Numbers of pinnipeds present on the haulout prior to commencement of the launch;

(ii) Numbers of pinnipeds that may have been harassed as noted by the number of pinnipeds estimated to have moved in response to the source of disturbance, ranging from short withdrawals at least twice the animal's body length to longer retreats over the beach, or if already moving a change of direction of greater than 90 degree, or, entered the water as a result of launch noise;

(iii) For any marine mammals that entered the water, the length of time they remained off the haulout; and

(iv) Behavioral modifications by pinnipeds that were likely the result of launch noise or the sonic boom.

(c) If the authorized activity identified in § 217.60(a) is thought to have resulted in the mortality or injury of any marine mammals or in any take of marine mammals not identified in § 217.62, then the USAF must notify the Director, Office of Protected Resources, NMFS, and the stranding coordinator, West Coast Region, NMFS, within 48 hours of the discovery of the injured or dead marine mammal.

(d) An annual report must be submitted on March 1 of each year to the Office of Protected Resources, NMFS.

(e) A final report must be submitted at least 180 days prior to [DATE 5 YEARS AFTER EFFECTIVE DATE OF FINAL RULE] to the Office of Protected Resources, NMFS. This report will:

(1) Summarize the activities undertaken and the results reported in all previous reports;

(2) Assess the impacts at each of the major rookeries;

(3) Assess the cumulative impacts on pinnipeds and other marine mammals from the activities specified in § 217.60(a); and

(4) State the date(s), location(s), and findings of any research activities related to monitoring the effects on launch noise, sonic booms, and harbor activities on marine mammal populations.

§ 217.66 Letters of Authorization.

(a) To incidentally take marine mammals pursuant to these regulations, the USAF must apply for and obtain a Letter of Authorization.

(b) A Letter of Authorization, unless suspended or revoked, may be effective for a period of time not to exceed [DATE 5 YEARS AFTER EFFECTIVE DATE OF FINAL RULE].

(c) If a Letter of Authorization expires prior to [DATE 5 YEARS AFTER EFFECTIVE DATE OF FINAL RULE], the USAF may apply for and obtain a renewal of the Letter of Authorization.

(d) In the event of projected changes to the activity or to mitigation and monitoring measures required by a Letter of Authorization, the USAF must apply for and obtain a modification of the Letter of Authorization as described in § 217.67.

(e) The Letter of Authorization will set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact (*i.e.,* mitigation) on the species, its habitat, and on the availability of the species for subsistence uses; and

(3) Requirements for monitoring and reporting.

(f) Issuance of the Letter of Authorization shall be based on a determination that the level of taking will be consistent with the findings made for the total taking allowable under these regulations.

(g) Notice of issuance or denial of a Letter of Authorization shall be published in the **Federal Register** within 30 days of a determination.

§ 217.67 Renewals and modifications of Letters of Authorization.

(a) A Letter of Authorization issued under §§ 216.106 of this chapter and 217.66 for the activity identified in § 217.60(a) shall be renewed or modified upon request by the applicant, provided that:

(1) The proposed specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for these regulations (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section); and

(2) NMFS determines that the mitigation, monitoring, and reporting measures required by the previous Letter of Authorization under these regulations were implemented.

(b) For Letter of Authorization modification or renewal requests by the applicant that include changes to the activity or the mitigation, monitoring, or reporting (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section) that do not change the findings made for the regulations or result in no more than a minor change in the total estimated number of takes (or distribution by species or years), NMFS may publish a notice of proposed Letter of Authorization in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the Letter of Authorization.

(c) A Letter of Authorization issued under §§ 216.106 of this chapter and 217.66 for the activity identified in § 217.60(a) may be modified by NMFS under the following circumstances:

(1) *Adaptive management.* NMFS may modify (including augment) the existing mitigation, monitoring, or reporting measures (after consulting with the USAF regarding the practicability of the modifications) if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring.

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in a Letter of Authorization:

(A) Results from the USAF's monitoring from the previous year(s).

(B) Results from other marine mammal and/or sound research or studies.

(C) Any information that reveals marine mammals may have been taken in a manner, extent or number not authorized by these regulations or subsequent Letters of Authorization.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS will publish a notice of proposed Letter of Authorization in the **Federal Register** and solicit public comment.

(2) *Emergencies.* If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in § 217.62, a Letter of Authorization may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within 30 days of the action.

§§ 217.68–217.69 [Reserved]

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