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(c) \* \* \*

(146) USxxx In the bands 24.25–24.45 GHz and 24.75–27.5 GHz, the total radiated power (TRP) of emissions from stations in the mobile service in any 200 MHz of the band 23.6–24 GHz shall not exceed –33 dBW/200 MHz for base stations and –29 dBW/200 MHz for mobile stations, and for stations brought into use after September 1, 2027, TRP shall not exceed –39 dBW/200 MHz for base stations and –35 dBW/200 MHz for mobile stations.

\* \* \* \* \*

## PART 30—UPPER MICROWAVE FLEXIBLE USE SERVICE

■ 3. The authority citation for part 30 continues to read as follows:

**Authority:** 47 U.S.C. 151, 152, 153, 154, 301, 303, 304, 307, 309, 310, 316, 332, 1302, unless otherwise noted.

■ 4. Amend § 30.203 by adding paragraph (d) to read as follows:

### § 30.203 Emission Limits.

\* \* \* \* \*

(d)(1) In addition to the limits noted above, for licensees operating mobile equipment in the 24.25–24.45 GHz or 24.75–25.25 GHz bands, the total radiated power of emissions in any 200 MHz of the 23.6–24.0 GHz band shall not exceed –33 dBW (for base stations) or –29 dBW (for mobile stations).

(2) For mobile equipment placed in service after September 1, 2027, the total radiated power of emissions in any 200 MHz of the 23.6–24.0 GHz band shall not exceed –39 dBW (for base stations) or –35 dBW (for mobile stations).

[FR Doc. 2024–01681 Filed 1–26–24; 8:45 am]

BILLING CODE 6712–01–C

## FEDERAL COMMUNICATIONS COMMISSION

### 47 CFR Part 54

[WC Docket Nos. 21–341; Report No. 3208; FR ID 198690]

### Petitions for Reconsideration of Action in Rulemaking Proceeding

**AGENCY:** Federal Communications Commission.

**ACTION:** Petition for Reconsideration.

**SUMMARY:** Petition for Reconsideration (Petitions) have been filed in the Commission's proceeding Thomas C. Power, on behalf of CTIA.

**DATES:** Oppositions to the Petitions must be filed on or before February 13, 2024. Replies to oppositions must be filed on or before February 8, 2024.

**ADDRESSES:** Federal Communications Commission, 45 L Street NE, Washington, DC 20554.

**FOR FURTHER INFORMATION CONTACT:** For additional information on this proceeding, contact Stephen Wang of the Wireline Competition Bureau, Telecommunications Access Policy Division, at (202) 418–7400 or [Stephen.Wang@fcc.gov](mailto:Stephen.Wang@fcc.gov).

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's document, Report No. 3208, released January 22, 2024. The full text of the Petitions can be accessed online via the Commission's Electronic Comment Filing System at: <http://apps.fcc.gov/ecfs/>. The Commission will not send a Congressional Review Act (CRA) submission to Congress or the Government Accountability Office pursuant to the CRA, 5 U.S.C. 801(a)(1)(A), because no rules are being adopted by the Commission.

**Subject:** Connect America Fund: A National Broadband Plan for Our Future High-Cost Universal Service Support (WC Docket Nos. 10–90, 14–58, 09–197, and 16–271; RM–11868).

**Number of Petitions Filed:** 1.

Federal Communications Commission.

**Marlene Dortch,**

*Secretary, Office of the Secretary.*

[FR Doc. 2024–01632 Filed 1–26–24; 8:45 am]

BILLING CODE 6712–01–P

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

### 50 CFR Part 217

[240118–0018]

RIN 0648–BM48

### Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to U.S. Space Force Launches and Supporting Activities at Vandenberg Space Force Base, Vandenberg, 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. Space Force (USSF) for authorization to take marine mammals incidental to launches and supporting activities at Vandenberg Space Force Base (VSFB) in Vandenberg, California from April, 2024 to April, 2029.

Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue regulations governing the incidental taking of marine mammals incidental to the specified activities. 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 MMPA authorization and agency responses will be summarized in the final notice of our decision. Missile launches conducted at VSFB, which comprise a smaller portion of the activities, are considered military readiness activities pursuant to the MMPA, as amended by the National Defense Authorization Act for Fiscal Year 2004 (2004 NDAA).

**DATES:** Comments and information must be received no later than February 28, 2024.

**ADDRESSES:** Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to <https://www.regulations.gov> and type NOAA–NMFS–2024–0008 in the Search box (note: copying and pasting the FDMS Docket Number directly from this document may not yield search results). Click on the “Comment” icon, complete the required fields, and enter or attach your comments.

**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 <https://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 will be publicly accessible. 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.

A copy of the USSF's application and other supporting documents and documents cited herein may be obtained online at: [www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities](http://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-military-readiness-activities). In case of problems accessing these documents, please use the contact listed here (see **FOR FURTHER INFORMATION CONTACT**).

**FOR FURTHER INFORMATION CONTACT:** Leah Davis, Office of Protected Resources, NMFS, (301) 427–8401.

**SUPPLEMENTARY INFORMATION:****Purpose and Need for Regulatory Action**

This proposed rule, if promulgated, would establish a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) for NMFS to authorize the take of marine mammals incidental to space vehicle (rocket) launches, missile launches, and aircraft operations at VSFB.

We received an application from the USSF requesting 5-year regulations and an associated letter of authorization to incidentally take marine mammals. Take is expected to 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**

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) generally direct the Secretary of Commerce (as delegated to NMFS) 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, regulations are promulgated (when applicable), and public notice and an opportunity for public comment are provided.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). If such findings are made, NMFS must prescribe the permissible methods of taking; “other means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to as “mitigation”); and requirements pertaining to the monitoring and reporting of such takings.

Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I provide the legal basis for proposing and, if appropriate, issuing regulations and an associated letters of authorization, or LOA(s). This proposed rule describes permissible methods of taking and mitigation,

monitoring, and reporting requirements for USSF’s proposed activities.

The National Defense Authorization Act for Fiscal Year 2004 (2004 NDAA, Pub. L. 108–136) amended the MMPA to remove the “small numbers” and “specified geographical region” limitations indicated above and amended the definition of “harassment” as applied to a “military readiness activity.” Missile launches conducted at VSFB, which comprise a small portion of the activities, are considered military readiness activities pursuant to the MMPA, as amended by the 2004 NDAA.

A subset of the activities described here and for which incidental take of marine mammals is being requested (specifically, missile launches) qualifies as a military readiness activity.

**Summary of Major Provisions Within the Rule**

Following is a summary of the major provisions of the regulations regarding USSF rocket and missile launches and supporting activities. These measures include:

- Scheduling launches to avoid lowest tides during harbor seal and California sea lion pupping seasons, when practicable;
- Required flight paths for aircraft takeoffs and landings and minimum altitude requirements to reduce disturbance to haul out areas;
- Required minimum altitudes for unscrewed aerial systems (UAS);
- Required acoustic and biological monitoring during a subset of launches to record the presence of marine mammals and document marine mammal responses to the launches; and
- Required semi-monthly surveys of marine mammal haulouts at VSFB and NCI.

**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 National Environmental Policy Act (NEPA) review.

Information in the USSF application and this notice 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 notice prior to concluding our NEPA process or making a final decision on the request for incidental take authorization.

**Summary of Request**

On November 2, 2022, NMFS received a request from USSF requesting authorization for the take of marine mammals incidental to rocket and missile launch activities and aircraft operations at VSFB in Vandenberg, California. Following NMFS’ review of the materials provided, USSF submitted a revised application on May 25, 2023. The application was deemed adequate and complete on May 26, 2023. USSF’s request for authorization pertains to incidental take of 6 species of marine mammals, by Level B harassment only.

On June 15, 2023, we published a notice of receipt of the USSF’s application in the **Federal Register** (88 FR 39231), requesting comments and information related to the USSF request for 30 days. We received no responsive comments.

The take of marine mammals incidental to rocket and missile launches and aircraft operations at VSFB is currently authorized by NMFS via an LOA issued under current incidental take regulations, which are effective from April 10, 2019 through April 10, 2024 (84 FR 14314; April 10, 2019). To date, NMFS has promulgated incidental take regulations under the MMPA for substantially similar activities at the site four times.

Responsibility for activities at the site were transferred from the U.S. Air Force (USAF) to the USSF in May, 2021 and both entities complied with the requirements (*e.g.*, mitigation, monitoring, and reporting) of the current LOA. Information regarding the monitoring results may be found in the Effects of the Specified Activity on Marine Mammals and their Habitat.

**Description of Proposed Activity****Overview**

USSF operations include launch activities for commercial entities, as well as the Department of Defense,

National Aeronautics and Space Administration. VSFB is the primary west coast launch facility for placing commercial, government and military satellites into polar orbit on uncrewed rockets. A subset of rocket launches include a “boost-back” maneuver, wherein the first stage booster returns to land at VSFB or at a barge located offshore, for recovery and future re-use. VSFB is also the site of launches for testing and evaluation of

intercontinental ballistic missiles (ICBMs) and sub-orbital target and interceptor missiles. The missile activities, which represent a small subset of the activities, are considered Military Readiness Activities.

Rocket and missile launch activities create noise (launch noise and/or sonic booms (overpressure of high-energy impulsive sound)) and visual stimulus that can take pinnipeds hauled out on shore along the periphery of VSFB by

Level B harassment. In addition, a subset of rocket launches can create noise that affects pinniped haul outs along the shoreline of the Northern Channel Islands (NCI), particularly San Miguel and Santa Rosa islands.

The USSF anticipates incremental increases in launch activity each year with a peak in activity of no more than 110 rocket launches and 15 missile launches occurring in any one year (table 1).

TABLE 1—ANTICIPATED NUMBER OF LAUNCHES AND UAS OPERATIONS, BY YEAR

Year	Rocket launches	Missile launches	UAS operations
2024 .....	40	15	100
2025 .....	55	15	100
2026 .....	75	15	100
2027 .....	100	15	100
2028 .....	110	15	100

In addition to rocket and missile launch activities at VSFB, aircraft conduct flight operations to support activities at VSFB. Here, “aircraft” includes crewed fixed wing airplanes and rotary wing helicopters, and different types of UAS. Slightly more than 600 aircraft flights occur each year, and approximately 100 of those flights are UAS. These flight operations address mission needs including emergency response, search-and-rescue, delivery of rocket components, launch mission support, security reconnaissance, and training. VSFB no longer has aircraft stationed on site, but “transient” aircraft may be stationed at the site on a temporary basis several times per year for periods of two or more weeks per operation. Take of hauled out pinnipeds from crewed fixed-wing airplanes and helicopter operations are not anticipated because these aircraft adhere to flight paths, minimum altitude requirements, and a buffer zone established to avoid

haulouts when possible. In addition, pinnipeds that customarily haul out at sites near the airfield may be acclimated to aircraft and helicopter overflights. However, there is a limited potential for take to result from UAS operations. UAS are categorized by size into five classes, 0–5. While harassment of hauled out pinnipeds from UAS classes 0–2 is unlikely to occur at altitudes of 200 feet (ft) and above (Erbe *et al.*, 2017; Pomeroy *et al.*, 2015; Sweeney *et al.*, 2016; Sweeney and Gelatt, 2017), given that classes 0–3 fly at lower altitudes, USSF anticipates that these classes could cause take of hauled out marine mammals due to visual disturbance, and NMFS concurs. Larger UAS (classes 4 and 5) that utilize the airfield for take offs and landings, must adhere to minimum altitude criteria and buffer zones around haul-out areas, as described in the Proposed Mitigation section. While pinnipeds at nearby haulouts may show brief reactions during takeoffs and landings of classes

4 and 5, animals near these haulouts are generally habituated to these activities and are not expected to have behavioral reactions that would rise to the level of take by Level B harassment.

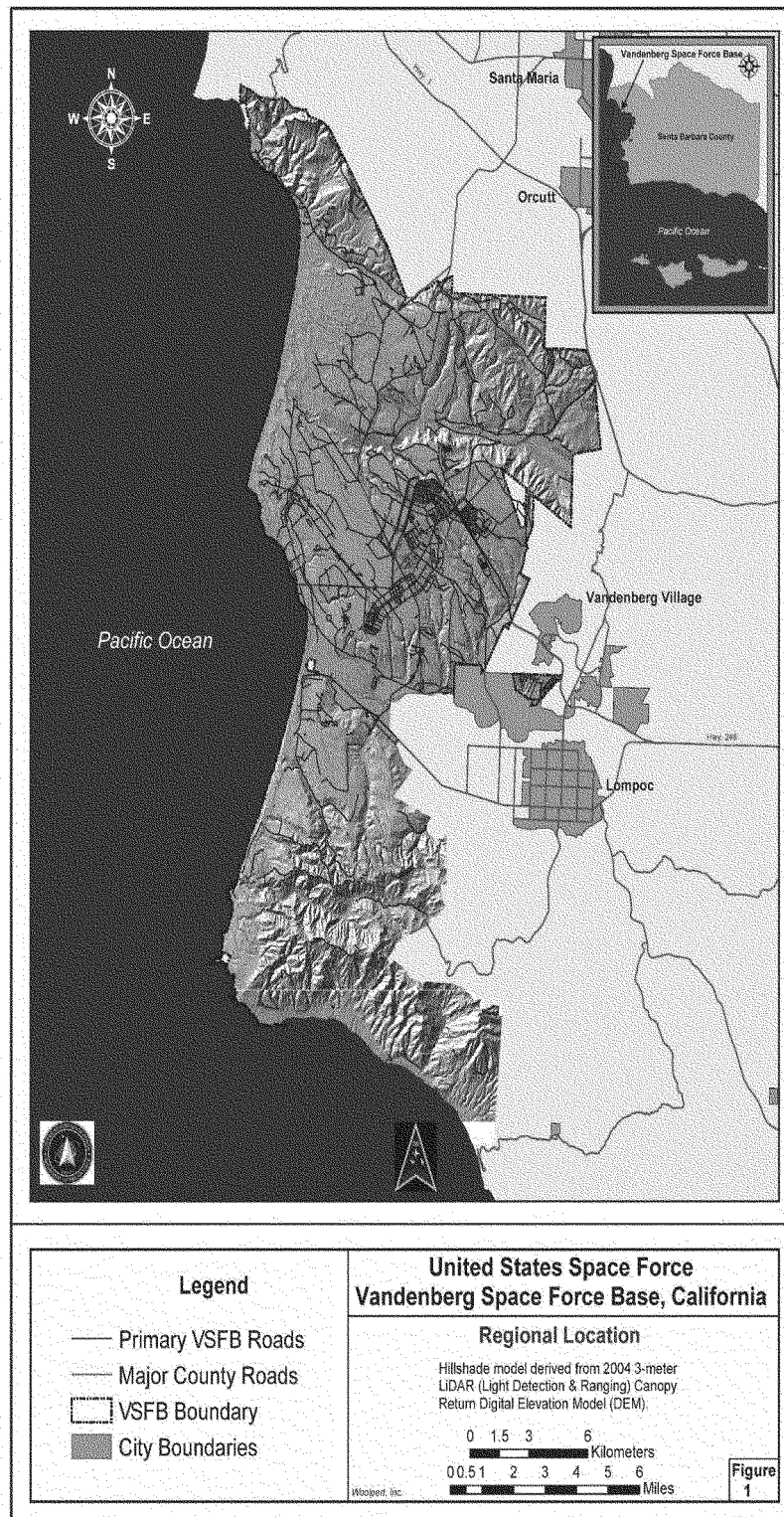
#### *Dates and Duration*

The activities proposed by USSF would occur for 5 years, from April 2024 through April 2029. Activities would occur year-round and could occur at any time of day, during any or all days of the week. As annual launch numbers increase, more than one launch could occur on some days.

#### *Specified Geographical Region*

VSFB occupies approximately 99,100 acres of land and approximately 68 kilometers (km) of coastline in central Santa Barbara County, California (Figure 1). The Santa Ynez River and State Highway 246 divide the base into two distinct parts, North Base and South Base.

**BILLING CODE 3510–22–P**



**Figure 1 – Vandenberg Space Force Base and Vicinity**

**BILLING CODE 3510-22-C**

Pinnipeds making use of haul-out sites along the coastline of VSFB are affected by launch noise. In addition to these effects at VSFB, some of the rocket

launches and first-stage recoveries originating at VSFB may result in sonic booms that impact portions of the NCI, and as such NCI is also considered part

of the project area. The NCI comprises four islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa) located approximately 50 km south of Point

Conception, which is located on the mainland approximately 6.5 km south of VSFB. The most proximate launch facility on the base and the nearest landmark on the NCI (Harris Point on San Miguel Island) are separated by more than 55 km.

Rocket and missile flights originate from several different launch locations on VSFB, distributed across both North Base and South Base. Currently, there are nine active missile launch sites and seven active space launch facilities. In

addition, two new launch sites and one former site on the base are expected to become operational in the future. The two largest classes of UAS use the VSFB airfield, three smaller classes of UAS can be launched from any location that is in keeping with buffers to pinniped haulout and rookery sites. The proximity of the launch sites in relation to specific pinniped haul-out and rookery areas at VSFB is shown in table 2. LF-09 is the closest active missile launch facility to a haul-out area,

located about 0.5 km from Little Sal, and LF-10 is the most remote facility from any haul-out area, located about 2.7 km from Lion's Head (see figure 2 in USSF's application).

While rocket and missile launches do not occur in National Marine Sanctuary waters, depending on the direction of a given launch, rockets and missiles may cross over the Channel Islands National Marine Sanctuary.

TABLE 2—REPRESENTATIVE ROCKET LAUNCH ACTIVITIES AND DISTANCE TO NEAREST HAUL-OUT SITE

Rocket	Rocket diameter (ft)	Rocket height (ft)	Launch facility	Nearest pinniped haul-out	Distance to haul-out (km)
<b>Current (and recent) launch programs</b>					
Atlas V .....	12.5	191	SLC-3E .....	North Rocky Point .....	9.9
Firefly .....	6	95	SLC-2W .....	Purísima Point .....	2.3
Delta IV .....	16	236	SLC-6 .....	North Rocky Point .....	2.3
Falcon 9 .....	12	230	SLC-4E .....	North Rocky Point .....	8.2
Minotaur .....	8	81	SLC-8 .....	North Rocky Point .....	1.6
Minotaur/Taurus .....	8	91	LF-576E .....	South Spur Road .....	0.8
Minotaur/Buzzard .....	6	63	TP-01 .....	Purísima Point .....	7.1
<b>Future launch programs</b>					
Vector .....	4	40	SLC-8 .....	North Rocky Point .....	1.6
Daytona .....	5	62	SLC-5 .....	Point Arguello .....	3.9
New Glenn .....	23	200	SLC-9 .....	Point Arguello .....	10.2
Vulcan .....	17.7	>220	SLC-3E .....	Point Arguello .....	8.75
Terran .....	7.5	126	SLC-11 .....	North Rocky Point .....	1.2

Abbreviations: SLC = Space Launch Complex; LF = Launch Facility; E = East; W = West; TBD: To be determined.

#### Detailed Description of the Specified Activity

VSFB is the primary west coast launch facility for placing commercial, government, and military satellites into polar orbit on uncrewed launch vehicles, and for the testing and evaluation of ICBMs and sub-orbital target and interceptor missiles by the Missile Defense Agency (MDA). Below, we discuss in detail, USSF's proposed rocket launches and recoveries, missile launches, and aircraft operations including UAS.

#### Rocket Launches

Table 1 shows estimates of the numbers proposed rocket launches, missile launches, and UAS activities for each year. Reporting years would span one year from date of LOA issuance and each successive year thereafter, in accordance with the reporting requirements described in the Proposed Monitoring and Reporting section, below. The anticipated maximum number of launches in one year shown in table 1 is similar to the maximum number of launches in one year analyzed in the 2019 rulemaking (84 FR

14314; April 10, 2019), with a small increase. For this rulemaking, USSF anticipates that the total number of launches would increase from the 500 analyzed for the 2019 rulemaking to 550 over the effective period of this rule. Similarly, the estimated number of launches that may cause a sonic boom that affect haulouts at NCI are proposed to increase from 88 to 104 over the effective period of this rulemaking.

A large percentage of this anticipated increase is expected to consist of smaller launch payloads moved by smaller rockets than previously utilized at VSFB. Accordingly, USSF is developing a new Small Launch Vehicles program (SLV) for the South Base launch sites at VSFB. This program is expected to require as many as 100 launches annually (included in the basewide 110 rocket launch/year total) and may involve two launches per day on some days. We note that "small" rockets (generally those less than 100 ft tall) are less likely to generate sonic booms that could disturb animals at haul outs.

Whether or not sonic booms from launches originating at VSFB affect the NCI depends on the trajectory of the

launch, the size of the rocket, and other factors such as environmental conditions. In any given year of this proposed rule, it is expected that fewer than 10 percent of small rockets, 25 percent of medium rockets and 33 percent of large rockets would "boom" the NCI. When these sonic booms events do occur, they tend to disturb animals at haulouts on San Miguel and (occasionally) Santa Rosa Islands. Santa Cruz and Anacapa Islands are not expected to be impacted by sonic booms in excess of 1 pound per square foot (psf). Further, based on several years of onsite behavioral observations and monitoring data, VSFB maintains and NMFS concurs that harassment of marine mammals is unlikely to occur when the intensity of a sonic boom is below 2(psf). Although exact numbers are uncertain, launches that generate a sonic boom at NCI higher than 2 psf are expected to occur no more than 5 times in authorization year 2024, 12 times in 2025, 24 times in 2026, 30 times in 2027 and 33 times in 2028.

Some rocket launches include "boost back" and landing of a rocket component at a launch site on the base or on a floating offsite recovery barge.

These activities include the use of parachutes and parafoils to control the descent of components to the barge. These are usually recovered, but on occasion, parachutes or parafoils are abandoned, and they sink to the ocean floor. The parachutes would sink to a depth of 1,000 ft within 46 minutes and the parafoil (if it is not recovered) would reach the same depth in one to two hours. Therefore, given the short duration that an unrecovered parachute or parafoil would remain in the water column for a given launch, NMFS does not anticipate that they would take marine mammals, and the likelihood is further reduced by the relative infrequency of instances where parachutes or parafoils are used but not recovered.

#### Missiles

A variety of small missiles are launched from various Launch Facilities (LFs) on north VSBF including Minuteman III, an ICBM which is launched from underground silos. USSF is currently modifying several existing silos for testing of the new Ground Based Strategic Defense (GBSD) program, which is expected to replace the Minuteman III as early as 2026. Several types of interceptor and target vehicles are also launched for the MDA. The MDA develops various systems including the Ballistic Missile Defense System (BMDS). The MDA estimates that no more than three missile tests per quarter will be conducted each year over the next 5 years, and none of the missiles would be significantly larger than the Minuteman III currently in use. This limitation (three missiles per quarter and none being larger than the Minuteman III) represents the anticipated extent of missile testing at VSBF over the next 5 years. No more than 15 missiles would be launched per year (table 1).

The trajectories of all missile launches are generally westward and USSF indicates that they do not cause sonic boom impacts on the California mainland or the NCI. Missiles also transition to nearly horizontal flight within seconds of launch and do not create extended noise impacts to the coastline or result in a high degree of response from hauled-out pinnipeds. For these reasons, take on the NCI arising from missile launch operations is not anticipated or requested. All take associated with missile launch operations would occur on VSBF.

#### Aircraft Operations

The VSBF airfield, located on north VSBF, supports various aircraft operations. Aircraft operations include

fixed wing airplanes, rotary wing helicopters and UAS. Of these, only UAS is expected to result in take, as discussed below.

Over the past 5 years, an average of slightly more than 600 flights has occurred each year, approximately 100 of which have been UAS, and USSF anticipates 100 UAS flights per year during the effective period of this proposed rule (table 1). Fixed-wing aircraft use VSBF for various purposes, including delivering rocket or missile components and training exercises. Helicopter (or, rotary wing) operations also occasionally occur at VSBF including transits through the area, exercises and mission support. Emergency helicopter operations, including but not limited to search-and-rescue and wildfire containment actions, also occur occasionally.

Three approved flight paths for airfield access have been configured in order to avoid disturbances from aircraft at established pinniped haul out sites. As a result of these routing measures and minimum altitude criteria, and given that pinnipeds that haul out at VSBF are acclimatized to aircraft and helicopter overflights, USSF does not anticipate take of hauled out pinnipeds from fixed-wing and helicopter operations using the airfield, and NMFS concurs. In addition, no pinniped responses to fixed or rotary wing aircraft have ever been reported and none are anticipated (MMCG and SAIC 2012a).

UAS operations at VSBF may include either rotary or fixed wing uncrewed 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). UAS classes 03 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 VSBF airfield. The launch frequency and class of UAS conducting the flights is not possible to predict. As stated above, there is a limited potential for take to result from UAS operations. While harassment of hauled out pinnipeds from class 02 is unlikely to occur at altitudes of 200 ft and above (Erbe *et al.*, 2017; Pomeroy *et al.*, 2015; Sweeney *et al.*, 2016; Sweeney and Gelatt, 2017), given that classes 0–3 fly at lower altitudes, USSF anticipates that these classes could cause take of hauled out marine mammals due to visual disturbance, and NMFS concurs.

#### Other Activities

In addition to the activities described above, USSF operates a small harbor on the south coast, immediately adjacent to a haulout area. Operation of the harbor currently entails a maximum of two large vessel visits per year and one dredging operation typically conducted every other year. In addition, VSBF estimates that SpaceX conducts approximately 30 2-day operations per year using smaller vessels. NMFS does not anticipate take of marine mammals due to these activities for the reasons described herein, and they are not discussed further beyond the brief explanation provided here. While marine mammals may behaviorally respond in some small degree to the noise generated by dredging operations, given the slow, predictable movements of these vessels, and absent any other contextual features that would cause enhanced concern, NMFS does not expect the proposed dredging to result in the take of marine mammals. Further, routine harbor operations are not anticipated to result in take of marine mammals.

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (see Proposed Mitigation and Proposed Monitoring and Reporting).

#### Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and relevant behavior and life history of the potentially affected species. NMFS fully considered all of this information, and we refer the reader to these descriptions and to additional information regarding population trends and threats that may be found in NMFS' Stock Assessment Reports (SARs); <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>). More general information about these species (e.g., physical and behavioral descriptions) may be found on NMFS' website (<https://www.fisheries.noaa.gov/find-species>).

Table 3 lists all species or stocks for which take is expected and proposed to be authorized for this activity, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. 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' SARs). While no serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species or stocks 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' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. We also refer to studies and onsite monitoring to inform abundance and

distribution trends within the project area. For some species, such as the Guadalupe fur seal, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' SARs. All values presented in table 3 are the most recent available at the time of publication and are available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>.

TABLE 3—MARINE MAMMAL SPECIES<sup>1</sup> LIKELY IMPACTED BY THE SPECIFIED ACTIVITIES

Common name	Scientific name	Stock	ESA/ MMPA status; strategic (Y/N) <sup>2</sup>	Stock abundance (CV, N <sub>min</sub> , most recent abundance survey) <sup>3</sup>	PBR	Annual M/SI <sup>4</sup>
<b>Order Carnivora—Pinnipedia</b>						
<i>Family Otariidae (eared seals and sea lions):</i>						
California Sea Lion .....	<i>Zalophus californianus</i> .....	United States .....	- , - , N	257,606 (N/A, 233,515, 2014)	14,011	>321
Guadalupe Fur Seal .....	<i>Arctocephalus townsendi</i> .....	Mexico .....	T, D, Y	34,187 (N/A, 31,019, 2013) ...	1,062	≥3.8
Northern Fur Seal .....	<i>Callorhinus ursinus</i> .....	California .....	- , D, N	14,050 (N/A, 7,524, 2013) ....	451	1.8
Steller Sea Lion .....	<i>Eumetopias jubatus</i> .....	Eastern .....	- , - , N	43,201 (N/A, 43,201, 2017) ...	2,592	112
<i>Family Phocidae (earless seals):</i>						
Harbor Seal .....	<i>Phoca vitulina</i> .....	California .....	- , - , N	30,968 (N/A, 27,348, 2012) ...	1,641	43
Northern Elephant Seal .....	<i>Mirovunga angustirostris</i> .....	California Breeding .....	- , - , N	187,386 (N/A, 85,369, 2013)	5,122	13.7

<sup>1</sup> Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (<https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/>; Committee on Taxonomy (2022)).

<sup>2</sup> 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.

<sup>3</sup> NMFS marine mammal SARs online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>. CV is the coefficient of variation; N<sub>min</sub> is the minimum estimate of stock abundance.

<sup>4</sup> 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. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

As indicated above, all six species (with six managed stocks) temporally and spatially co-occur with the specified activity to the degree that take is reasonably likely to occur. In addition to the 6 species of pinniped expected to be affected by the specified activities, an additional 28 species of cetaceans are expected to occur or could occur in the waters near the project area. However, we have determined that the potential stressors associated with the specified activities that could result in take of marine mammals (i.e., launch noise, sonic booms and disturbance from aircraft operations) only have the potential to result in harassment of marine mammals that are hauled out of the water. Noise from the specified activities is unlikely to ensonify subsurface waters to an extent that could result in take of cetaceans. 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. Accordingly, cetaceans are not considered further in this proposed rule. Further, only one live

northern fur seal has been reported at VSFB in the past 25 years (SBMMC 2012), at least two deceased fur seals have been found on VSFB. Guadalupe fur seals have yet to be reported at VSFB. Therefore, it is extremely unlikely that any fur seals will be taken at that site. However as discussed below, NMFS anticipates that both species could be taken at NCI. Steller sea lions are not anticipated to occur at NCI, and therefore, are not expected to be taken at that site, but are likely to be taken at VSFB. Harbor seal, northern elephant seal, and California sea lion are likely to be taken at both NCI and VSFB.

California sea otters (*Enhydra lutris nereis*) may also be found in waters off of VSFB, which is near the southern extent of their range. However, California sea otters are managed by the U.S. Fish and Wildlife Service and are not considered further in this proposed rule.

#### *Pacific Harbor Seal (California Stock)*

Harbor seals haul out on intertidal sandbars, rocky shores and beaches along the California coast and islands including VSFB and, to a lesser extent,

NCI. Coastwide, from 400 to 600 haul-out sites exist (Carretta *et al.*, 2011; Carretta *et al.*, 2012) and few to several hundred animals may occupy each site when conditions are favorable. Harbor seals generally haul out in greatest numbers during the afternoon but at some sites the beach profile and tidal inundation results in limited or no suitable haul out area. This is the case in some areas around VSFB, where shifting of coastal landforms including beaches, banks and bluffs affect availability of suitable haul out area. Considerable haul out area is consistently available at NCI, irrespective of tidal influence.

Harbor seals generally forage locally but individuals, particularly juveniles, may travel up to 500 km either to find food or suitable breeding areas. The greatest numbers haul out during the molting season, from May into August throughout California (Carretta *et al.*, 2011; Carretta *et al.*, 2012). In the vicinity of the project area, the pupping season peaks from mid-February through April; and at VSFB, it extends from March through June. Molting season follows, sometimes overlapping the pupping



season. Harbor seal numbers at VSFB haul out areas usually peak in June, but there is some variability (in some years the highest counts occurred in the fall or winter months). Harbor seal pupping also occurs on NCI from March to June.

Harbor seals regularly use haulouts along the shoreline at VSFB. Haulout sites on VSFB can be found on both south VSFB and north VSFB, including Lion's Head and Little Sal.

#### *California Sea Lion (U.S. Stock)*

The California sea lion occurs in the eastern north Pacific from Puerto Vallarta, Mexico, through the Gulf of California and north along the west coast of North America to the Gulf of Alaska (Barlow *et al.*, 2008; DeLong *et al.*, 2017b; Jefferson *et al.*, 2008). Typically, during the summer, California sea lions congregate near rookery islands and specific open-water areas, including NCI where one of the largest rookeries is found. The primary rookeries off the coast of the United States are on San Nicolas (SNI), San Miguel, Santa Barbara, and San Clemente Islands (Le Boeuf & Bonnell 1980; Lowry *et al.*, 1992; Carretta *et al.*, 2000; Lowry & Forney 2005; Lowry *et al.*, 2017). About 50 percent of the births on San Miguel Island occur in the Point Bennett area, during a pupping season that runs from May to August.

In the nonbreeding season, beginning in late summer, adult and subadult males migrate northward along the coast of California to more northerly states, and are largely absent from the southern breeding areas until the following spring (Laake, 2017; Lowry & Forney, 2005). Females and juveniles also disperse to areas north and west of NCI, but tend to stay in the Southern California area. (Lowry & Forney, 2005; Melin & DeLong, 2000; Thomas *et al.*, 2010).

California sea lions also occur in open ocean and coastal waters (Barlow *et al.*, 2008; Jefferson *et al.*, 2008). Animals usually occur in waters over the continental shelf and slope; however, they are also known to occupy locations far offshore in deep, oceanic waters, such as Guadalupe Island and Alijos Rocks off Baja California (Jefferson *et al.*, 2008; Melin *et al.*, 2008; Urrutia & Dziendzielewski, 2012; Zavala-Gonzalez & Mellink, 2000). California sea lions are the most frequently sighted pinnipeds offshore of Southern California during the spring, and peak abundance is during the May through August breeding season (Green *et al.*, 1992; Keiper *et al.*, 2005; Lowry *et al.*, 2017).

California sea lions haul out at sites in the southern portion of VSFB and have not been observed at any northern

VSFB haulout locations, except for rare individuals affected by domoic acid poisoning (USAF 2020; Evans, 2020). There is no known successful breeding of this species on VSFB.

In 2019 a significant die-off of California sea lions, presumed to be caused by domoic acid toxicity associated with red tide algal blooms, was noted. This event included most of Southern and Central California and included more than 80 deceased California sea lions on VSFB beaches (USAF 2020; Evans, 2020).

California sea lion pupping season begins in late May, peaking on or around the third week of June. Female sea lions nurse their pups for 1 to 2 days, before embarking on progressively longer spans of time away from the haulout site to forage. Typically, the adult female spends 2 to 5 days feeding, before returning to nurse the pup. Females continue a pattern of going to sea for several days and nursing ashore for several days until pups are weaned. The weaning period continues for about 8 to 12 months (Carretta *et al.*, 2011; Carretta *et al.*, 2012).

Females usually range from the Mexican border to as far north as San Francisco. If prey is scarce, particularly during El Niño years, they have been known to extend their range into Oregon. Adult males claim their breeding territories in late May, usually leaving by August, with most animals moving north. Adult males may venture as far north as British Columbia or southeast Alaska.

#### *Northern Elephant Seal (California Breeding Stock)*

The California breeding stock of the Northern elephant seal extends from the Channel Islands to the southeast Farallon Islands (Carretta *et al.*, 2011; Carretta *et al.*, 2012). There are two distinct populations of northern elephant seals: one that breeds in Baja California, Mexico; and a population that breeds in California (Garcia-Aguilar *et al.* 2018). The northern elephant seals in the VSFB Project Area are from the California Breeding stock, although elephant seals from Baja Mexico migrate through the Project Area (Auriolles-Gamboa & Camacho-Rios 2007; Carretta *et al.*, 2017; Carretta *et al.*, 2020). Females and juveniles feed from California into Washington, while males travel as far as Alaska and the Aleutians. Males and females return between March and August to molt.

Northern elephant seals spend little time nearshore and migrate four times a year, traveling to and from breeding/pupping and molting areas and spending more than 80 percent of their

annual cycle at sea (Robinson *et al.*, 2012; Lowry *et al.*, 2014; Lowry *et al.*, 2017; Carretta *et al.*, 2020). Peak abundance in California is during the January–February breeding season and when adults return to molt from April to July (Lowry *et al.* 2014; Lowry *et al.*, 2017).

Although northern elephant seals haul out at south VSFB locations, they were not observed at north VSFB haul outs in 2019 or in 2020. Breeding has been observed on south VSFB since 2017 (Evans, 2020), and pupping at VSFB was first documented in January 2017. Additional pupping has been observed every year since 2017, increasing each year, with a maximum of approximately 40 pups in 2022. Pupping occurs from January through March, with peak breeding in mid-February. Pups are weaned at 3 to 4 weeks of age, then abandoned and undergo their first molt, which can take several weeks. They then return to sea and customary offshore waters at the end of the molting cycle. Currently, the Amphitheatre Cove haul out at VSFB is the primary site used by elephant seals for breeding and pupping, however another location, Boathouse Beach, was the site for two successful pups each year in 2021 and 2022. All age classes and sexes haul out on VSFB, at different times of the year, to rest, undergo molting and to reproduce or occasionally to rest at other times of year. On NCI, pupping activity occurs from December through March. While some animals disperse after the weaning period, elephant seals also haul out onshore during the seasonal molting period from March to August.

#### *Steller Sea Lion (Eastern U.S. Stock)*

The eastern U.S. stock of Steller sea lions ranges from Cape Suckling, Alaska, to California (Cape Suckling is almost at the northernmost part of the Gulf of Alaska, at long. 140° W). Año Nuevo Island, in central California, is now the southernmost known breeding colony for Steller sea lions (Carretta *et al.*, 2011; Carretta *et al.*, 2012), although they did breed at San Miguel Island until the 1982–1983 El Niño. Sightings were rare after that. From 2010 to 2012, individual Steller sea lions have shown up along the mainland coast of the Southern California Bight, often hauled out on navigation buoys. At VSFB, Steller sea lions have been observed in generally low numbers since approximately 2012, but no breeding or pupping behavior has been documented.

Steller sea lions range along the north Pacific from northern Japan to California (Perrin *et al.*, 2009), with centers of



abundance and distribution in the Gulf of Alaska and Aleutian Islands (Muto *et al.*, 2020). There have also been reports of Steller sea lions in waters off Mexico as far south as the various islands off the port of Manzanillo in Colima, Mexico (Gallo-Reynoso *et al.*, 2020). The eastern U.S. stock (or DPS) of Steller sea lion is defined as the population occurring east of long. 144° W. The locations and distribution of the eastern population's breeding sites along the U.S. Pacific coast have shifted northward, with fewer breeding sites in southern California and more sites established in Washington and southeast Alaska (Pitcher *et al.*, 2007; Wiles, 2015). Steller sea lions pups were known to be born at San Miguel Island up until 1981 (Pitcher *et al.*, 2007; National Marine Fisheries Service 2008; Muto *et al.*, 2020), and as the population continues to increase, Steller sea lions may re-establish a breeding colony on San Miguel Island. However, currently no pupping occurs on NCI.

Despite the species' general absence from the area, some Steller sea lions (one to two individuals at a time) have been sighted in the Channel Islands and vicinity. Individual adult and subadult male Steller sea lions have been seen hauled out at San Miguel Island during the fall and winter, and adult and subadult males have occasionally been seen on rocks north of Northwest Point at San Miguel Island in the summer (DeLong, 2019). Aerial surveys for pinnipeds in the Channel Islands from 2011 to 2015 encountered a single Steller sea lion at SNI in 2013 (Lowry *et al.*, 2017). Additional sightings have included a single male that was seen hauled out on an oil production structure off Long Beach during the winter of 2015 and 2016, a Steller observed in 2018 hauled out on a buoy outside Ventura Harbor, and a lone adult female that gave birth to and reared a pup on San Miguel Island in the summer of 2017 (DeLong 2019).

In April and May 2012 Steller sea lions were observed at VSFB marking the first time this species had been reported at VSFB over the prior two decades. Since 2012, Steller sea lions have been observed occasionally in routine monthly surveys, with a peak of 16 individuals recorded. In 2019, up to four Steller sea lions were observed on south VSFB during monthly marine mammal counts, and none were observed during monthly counts in the years that followed. While flying to VSFB from Santa Maria for an unrelated project, contract biologists observed and photographed three Steller sea lions at Lion Rock (Point Sal) in October 2017 (Ball, 2017). This offshore haulout site

can be exposed to in-air noise levels from missile launches and is included in the take estimates provided below.

#### *Northern Fur Seal (San Miguel Island Stock)*

Northern fur seals range from southern California to the Bering Sea and west to the Okhotsk Sea and Japan. About 74 percent of the breeding population occurs far north of the project area, on the Pribilof Islands of the southern Bering Sea. The San Miguel Island stock comprises less than one percent of the population. In general, Northern fur seals are highly pelagic, and adult northern fur seals spend more than 300 days per year (about 80 percent of their time) at sea, generally well offshore. While at sea, northern fur seals range throughout the North Pacific (Carretta *et al.*, 2011; Carretta *et al.*, 2012). Migrating seals and those along the U.S. west coast are typically found over the edge of the continental shelf and slope (Kenyon & Wilke 1953; Sterling & Ream 2004; Gentry 2009; Adams *et al.* 2014). Northern fur seals have not been observed at any VSFB haulout location (NMFS, 2020b) and are not expected to be subject to noise levels at the base that may cause behavioral effects.

Adult males stay on or near haul-outs on NCI from May through August, with some non-breeding individuals remaining until November. Beginning in May, male seals start returning to the breeding islands. Upon arrival males seek to occupy and defend optimal breeding territories before the females arrive. Because males do not leave the breeding territory to feed, their ability to fast is critical. Males remain on their territory an average of 46 days. Adult females generally stay on or near haul-outs beginning in June and extending to fall, sometimes as late as November. Peak pupping is in early July. Females nurse their newborn pups for 5 to 6 days and then go to sea to forage for 3.5 to 9.8 days. Females continue to cycle between land and sea for the remainder of the nursing period. Their time on land declines to less than 2 days and their time at sea generally increases. Pups are nursed until weaned (about 4 months) and leave the breeding site before their mothers to forage independently. Some juveniles are present year-round, but most juveniles and adults head for the open ocean and a pelagic existence until the following year. Pupping occurs at NCI (San Miguel Island) from June through August. Pupping does not occur at VSFB.

#### *Guadalupe Fur Seal (Mexico)*

Satellite tracking data from Guadalupe fur seals tagged at Guadalupe Island in Mexico, have shown that the seals transit through offshore waters between 50 and 300 km from the U.S. west coast (Norris *et al.* 2015; Norris, 2017b; Norris, 2017a; Norris & Elorriaga-Verplancken, 2020). Based on that data, the seals could occur in ocean and coastal waters within or adjacent to the VSFB Project Area. However, Guadalupe fur seals have not been observed at any VSFB haulout locations (USAF 2020; Evans, 2020) and are not expected to be subject to in-air noise levels at VSFB that may cause behavioral disturbance. Guadalupe fur seals are only rarely observed on San Miguel and San Nicolas Islands, typically at Point Bennett, and are almost always sighted as a lone individual. Lone adult males twice established territories on San Nicolas Island which lasted a few years each time, but no females arrived (Carretta *et al.*, 2011; Carretta *et al.*, 2012). As such, there is no pupping activity within the project area.

#### **Potential Effects of Specified Activities on Marine Mammals and Their Habitat**

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The Estimated Take of Marine Mammals 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 of Marine Mammals 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 whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

In-air acoustic effects resulting from rocket launches and recoveries, missile launches and UAS operations may affect hauled out marine mammals. The effects of noise from the USSF's proposed activities have the potential to result in Level B harassment of marine mammals in the action area.

#### *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  $\mu$ Pa.

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  $\mu$ Pa<sup>2</sup>-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; ANSI, 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. 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 or exposure context (e.g., frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source, ambient noise, and the receiving animal's hearing, motivation, experience, demography, behavior at time of exposure, life stage, depth) and can be difficult to predict (e.g., Southall, *et al.*, 2007, Southall *et al.*, 2021; Ellison *et al.*, 2012).

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; 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). Not all behavioral responses are indicative of a take. For further discussion of behavioral responses as they relate to take, see table 5.

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 is dependent upon a number of contextual factors including, but not limited to, sound source frequencies, whether the sound source is moving towards the animal, hearing ranges of marine mammals, behavioral state at time of exposure, status of individual

exposed (e.g., reproductive status, age class, health) and an individual's experience with similar sound sources. Southall *et al.*, (2021), Ellison *et al.* (2012) and Moore and Barlow (2013), among others, emphasize the importance of context (e.g., behavioral state of the animals, distance from the sound source) in evaluating behavioral responses of marine mammals to acoustic sources.

Marine mammals that occur in the project area could be exposed to in-air sound that has the potential to result in behavioral harassment of pinnipeds that are hauled out. Airborne sound at certain levels is expected to result in 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 a change from resting state to an 'alert' posture or to flush from a haulout site into the water.

The results from studies of pinniped response to acoustic disturbance arising from launches and associated sonic booms at VSFB and NCI are highly variable (Holst *et al.*, 2005; Ugoretz and Greene Jr. 2012). Pinniped responses to rocket launches at the sites have been monitored for well over two decades. Monitoring data have consistently shown that the degree of pinniped reactions to sonic booms varies among species (table 4), with harbor seals typically showing the highest levels of disturbance, followed by California sea lions, and with northern elephant seals generally being much less responsive. Steller sea lions are only rarely observed in the project area and react to launch noise infrequently. Types of responses range from no response to heads-up alerts, from startle responses to some movements on land, and from some movements into the water to one instance of stampede.

TABLE 4—REPRESENTATIVE PINNIPED RESPONSES TO SONIC BOOMS AT SAN MIGUEL ISLAND, DOCUMENTED IN U.S. AIR FORCE LAUNCH MONITORING REPORTS

Launch event	Sonic boom level (psf)	Monitoring location	Species observed and responses
Athena II (April 27, 1999) .....	1	Adams Cove .....	California sea lion: 866 alerted; 232 (27 percent) 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 percent) 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.

TABLE 4—REPRESENTATIVE PINNIPED RESPONSES TO SONIC BOOMS AT SAN MIGUEL ISLAND, DOCUMENTED IN U.S. AIR FORCE LAUNCH MONITORING REPORTS—Continued

Launch event	Sonic boom level (psf)	Monitoring location	Species observed and responses
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 percent 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 percent 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 percent) 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 .....	California sea lion: 5 of ~225 alerted; none flushed.
Atlas V (October 8, 2015) .....	1.96	East Adams Cove of Point Bennett.	California sea lion: ~60 percent of CSL alerted and raised their heads. None flushed. Northern elephant seal: No visible response to sonic boom, none flushed. Northern fur seal: 60 percent alerted and raised their heads. None flushed.
Atlas V (March 1, 2017) .....	<sup>a</sup> ~0.8	Cuyler Harbor on San Miguel Island.	Northern elephant seal: 13 of 235 (6 percent) alerted; none flushed.

<sup>a</sup>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.

Post-launch monitoring of pinniped behavior shows that return to pre-launch numbers of animals and types of behaviors occurs within minutes or up to an hour or two after each launch event, regardless of species.

Responsiveness also varies with time of year and age class, with juvenile pinnipeds being more likely to react by entering the water and temporarily leaving the haulout site. The probability and type of behavioral response also depends on the season, the group composition, and the type of activity or behavior at the time of disturbance. For example, in some cases, harbor seals have been found to be more responsive during the pupping/breeding season (Holst *et al.*, 2005a; Holst *et al.*, 2008) while in other instances, lone individuals seem more prone to react than mothers and pups (Ugoretz and Greene Jr., 2012). California sea lions seem to be consistently less responsive during the pupping season (Holst *et al.*, 2010; Holst *et al.*, 2005a; Holst *et al.*, 2008; Holst *et al.*, 2011; Holst *et al.*, 2005b; Ugoretz and Greene Jr., 2012).

Pup abandonment could theoretically result in instances where adults flush

into the water as a result of sound from an in-season launch. In its application, USSF cites one instance of a stampede on NCI that was triggered by launch noise in excess of that predicted to occur from USSF's proposed activity. No instances of pup abandonment are reflected in site-specific monitoring data. Given there is only one known instance of a stampede and no known pup abandonment, we find that abandonment is not likely to occur from future activities that create similar sound levels as those in the past. While reactions are variable, and can involve abrupt movements by some individuals, biological impacts of observed responses to launch activities and supporting operations appear to be limited in duration and consist of behavioral disruption including temporary abandonment of a haul out area.

#### *Anticipated Effects on Marine Mammal Habitat*

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 activities 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). Therefore, it is not expected that the specified activities would impact feeding success of pinnipeds.

While it is anticipated that the proposed activity may result in marine mammals avoiding certain haulout areas due to temporary ensonification of out-of-water habitat, this impact is temporary and reversible and was discussed earlier in this document, in the context of behavioral modification. No impacts are anticipated to accrue to prey species or to foraging areas and in-water habitat frequented by pinnipeds. The main impact associated with the proposed activity will be temporarily elevated in-air noise levels and the associated reaction of certain pinnipeds, previously discussed in this proposed rule.

#### **Estimated Take of Marine Mammals**

This section provides an estimate of the number of incidental takes proposed

for this rule, which will inform both NMFS' consideration of "small numbers" and the negligible impact determinations.

Harassment is the only type of take expected to result from these activities. Except with respect to military readiness activities, 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). As stated above, a comparatively small portion of USSF's activities are considered military readiness activities. For military readiness activities, the MMPA defines "harassment" as: (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) Any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where the behavioral patterns are abandoned or significantly altered (Level B harassment). The take estimate methodology outlined below is considered appropriate for the quantification of take by Level B harassment based on either of the two definitions.

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 launch related visual or auditory stimulus. Based on the nature of the activity and as shown in activity-specific studies (described below), Level A harassment is neither anticipated nor proposed to be authorized. As described previously, no serious injury or mortality is anticipated or proposed to be authorized for this activity. Below we describe how the proposed take numbers are estimated.

For acoustic impacts, 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) the number of days of activities. We note that while these factors can contribute to a basic calculation to provide an initial prediction of potential 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 (which include thresholds for take from launches and UAS, considered in combination with pinniped survey data in the form of daily counts) in more detail and present the proposed take estimates.

#### *Acoustic Thresholds*

For underwater sounds, NMFS recommends the use of acoustic thresholds that identify the received levels 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. Here, thresholds for behavioral disturbance from launch activities have been developed based on observations of pinniped responses before, during, and after launches and UAS activity. For rocket and missile launches at VSFB, given the sound levels and proximity, NMFS assumes that all rocket launches will behaviorally harass pinnipeds of any species hauled out at sites around the periphery of the base. For rocket launches from VSFB that transit over or near NCI, based on several years of onsite behavioral observations and monitoring data, NMFS predicts that those that create a sonic boom over 2.0 psf could behaviorally harass pinnipeds of any species hauled out on NCI. For UAS activity NMFS predicts that, given the potential variability of locations, routing and altitudes necessary to meet mission needs, classes 0–3 could behaviorally harass pinnipeds of any species hauled out at VSFB.

Regarding potential hearing impairment, the effects of launch noise on pinniped hearing were the subject of studies at the site in the past. In addition to monitoring pinniped haul-out sites before, during and after launches, researchers were previously required to capture harbor seals at nearby haulouts and Point Conception to test their sensitivity to launch noises. Auditory Brainstem Response (ABR) tests were performed under 5-year SRPs starting in 1997. The goal was to determine whether launch noise

affected the hearing of pinnipeds (MMCG and SAIC 2012a). The low frequency sounds from launches can be intense, with the potential of causing a temporary threshold shift (TTS), in which part or all of an animal's hearing range is temporarily diminished. In some cases, this diminishment can last from minutes to days before hearing returns to normal. None of the seals tested in these studies over a span of 15 years showed signs of TTS or PTS, supporting a finding that launch noise at the levels tested is unlikely to cause PTS and that any occurrence of TTS may be of short duration.

#### *Ensonified Area*

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

Because the haulouts at NCI are more distant from the rocket launch sites than those at VSFB, different methods are used to predict when launches are likely to impact pinnipeds at the two sites. As stated above, for rocket and missile launches at VSFB, NMFS conservatively assumes that all rocket launches will behaviorally harass pinnipeds of any species hauled out at sites around the periphery of the base. For rocket launches from VSFB that transit over or near NCI, NMFS predicts that those that are projected to create a sonic boom over 2 psf could behaviorally harass pinnipeds of any species hauled out on NCI. For UAS activity, NMFS predicts that classes 0–3 could behaviorally harass pinnipeds of any species hauled out at VSFB.

The USSF 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 UAS operations. Many different types of launch vehicle types are operated from VSFB. Different combinations of vehicles and launch sites create different sound profiles, and dynamic environmental conditions also bear on sound transmission. As such, the different haul-out sites around the periphery of the base are ensonified to varying degrees when launches and, when applicable, recoveries of first stage boosters occur. USSF is not able to predict the exact timing, types and trajectories of these future rocket launch programs. However, as described below, rocket launches are expected to behaviorally disturb pinnipeds at VSFB and some launches are also expected to disturb pinniped hauled out at NCI. Missiles are only expected to impact pinnipeds at Lion Rock (Point Sal), and

UAS impacts are only expected to occur at Small Haulout 1 (in VSFB).

Therefore, for the purposes of estimating take, we conservatively estimate that all haulout sites at VSFB will be ensonified by rocket launch noise above the level expected to result in behavioral disturbance. Different space launch vehicles also have varying trajectories, which result in different sonic boom profiles, some of which are likely to affect areas on the NCI (San Miguel, Santa Rosa, Santa Cruz, and Anacapa). Based on several years of onsite monitoring data, harassment of marine mammals is unlikely to occur when the intensity of a sonic boom is below 2 psf. Santa Cruz and Anacapa Islands are not expected to be impacted by sonic booms in excess of 2 psf (USAF, 2018), therefore, USSF does not anticipate take of marine mammals on these islands, and NMFS concurs. Sonic booms from VSFB launches or recoveries can impact haul out areas and may take marine mammals on San Miguel Island and occasionally on Santa Rosa Island. In order to accommodate the variability of possible launches and (when applicable) sonic booms over NCI, USSF estimates that 25 percent of pinniped haulouts on San Miguel and Santa Rosa Islands may be ensonified to a level above 2 psf. NMFS concurs, and 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 2 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 (personal communication: R. Evans, USSF, to J. Carduner, NMFS, OPR).

Modeling has not been required for launches of currently deployed missiles because of their trajectories west of VSFB and north of San Miguel Island and the previously well-documented acoustic properties of the missiles. The anticipated GBSD is expected to utilize approximately the same trajectories as the current ICBM, and the GBSD program will be required to model at least one representative launch. When missiles are launched in a generally western direction (they turn south several hundred miles from VSFB and at high altitude), there is no sonic boom impact on the NCI; thus take of pinnipeds on NCI is not anticipated from missile launches. Given flight characteristics and trajectories, take from missile launch is not anticipated for most species. However, given proximity and the generally western trajectory, noise from missile launches from North Base may take California sea lions that haul out at Lion Rock (Point Sal) near VSFB's northern boundary.

Marine Mammal Occurrence and Take Estimation

In this section, we bring together the information above and describe take from the three different activity types (rockets, missiles, and UAS) expected to occur at VSFB and NCI, the marine

mammal occurrence data (based on two survey series specific to VSFB and NCI), species and location-specific data related the likelihood of either exposure (e.g., tidal differences) or response (e.g., proportion of previously recorded responses that qualify as take), and the amount of activity. We describe the calculations used to arrive at the take estimates for each activity, species, and location, and present the total estimated take in table 14.

NMFS uses a three-tiered scale to determine whether the response of a pinniped on land to stimuli is indicative of Level B harassment under the MMPA (table 5). NMFS considers the behaviors that meet the definitions of both movements and flushes in table 5 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 or stir without other movements indicative of disturbance are not considered harassed. Prior observations of pinniped responses to certain exposures may be used to predict future responses and assist in estimating take. Here, the levels of observed responses of particular species during monitoring are used to inform take estimate correction factors as described in the species and activity-specific sections below.

TABLE 5—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.

Data collected from marine mammal surveys including monthly marine mammal surveys and launch-specific monitoring conducted by the USSF at VSFB, and observations 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 VSFB are

conducted to document the abundance, distribution and status of pinnipeds at VSFB. 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. Some species are observed regularly at VSFB and the NCI (e.g., California sea lion), while other species are observed less frequently (e.g., northern fur seals and Guadalupe fur seals).

Take estimates were calculated separately for each stock in each year the proposed regulations would be valid

(from 2024 to 2029), 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 UAS 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. Second, we estimated the percentage of animals that would be taken by harassment from a launch at a given site, using the corrections and adjustments. In order to determine that percentage, we considered whether certain factors could result in fewer than the total estimated number at a location being harassed. These factors include whether the extent of ensonification is expected to affect only a portion of the animals in an area, tidal inundation that displaces animals from affected areas and for species reactivity to launch noise, life history patterns and, where appropriate, seasonal dispersal patterns.

Launches covered in this authorization are not expected to produce a sonic boom over the mainland except that some first stage recoveries back to launch facilities on

the base that may do so. Because first stage recoveries always occur within ten minutes of the initial launch, a response from any given animal to both launch and recovery are considered to be one instance of take, even when both launch and recovery meet or exceed the 2 psf threshold for calculating take.

#### Vandenberg Space Force Base

As described above, rocket launches, missile launches, and UAS activities are expected to result in take of pinnipeds on VSFB at haul outs along the periphery of the base. Because the supporting information and/or methods are different for these three activity types, we describe them separately below. Launches from different launch facilities at VSFB create different degrees of ensonification at specific haul out sites, and further, USSF has limited ability to forecast which launch sites may be used for future launches. As described previously, some launches also involve the recovery of a booster component back to the launch site, or to an alternate offshore location.

As noted above, NMFS first estimated the number of hauled out animals per month at VAFB for each stock. NMFS used marine mammal counts collected

by USSF during monthly marine mammal surveys to approximate haulout abundance. NMFS compared monthly counts for a given species from 2020 to 2022 and selected the highest count (sum across all haul out sites) for each month for each species, as indicated in table 6. NMFS then selected the highest monthly count for each species and used that as the estimated number of animals that would be hauled out at any given time during a launch. Because launches from different SLCs impact different haulouts, we expect that using this highest monthly estimate will result in a conservative take estimate. Therefore, NMFS considers the 2020–2022 survey data relied upon to be the best data available.

As further indicated in the table 7, and described below, the predicted number of animals taken by each launch, by species, is adjusted as indicated to account for the fact that (1) for some species, animals are only hauled out and available to be taken during low tide and (2) years of monitoring reports showing that different species respond behaviorally to launches in a different manner.

TABLE 6—VSFB MAX COUNTS FROM MONTHLY SURVEYS, 2020–2022

Month	Pacific harbor seal	California sea lion	Steller sea lion	Northern elephant seal
Jan .....	61	11	None in USSF record 2020–2022 .....	76
Feb .....	73	9	0 .....	63
Mar .....	105	0	0 .....	50
Apr .....	87	3	0 .....	173
May .....	95	* 112	0 .....	* 302
Jun .....	* 149	72	0 .....	78
Jul .....	61	26	0 .....	20
Aug .....	60	1	0 .....	11
Sept .....	54	16	0 .....	82
Oct .....	59	2	0 .....	228
Nov .....	65	28	0 .....	251
Dec .....	51	16	0 .....	122
USSF Estimated Max: * 5 .....				

**Note:** \* indicates the highest monthly count for a given species.

#### Rocket Launches at VSFB

USSF assumes that all rocket launches would take, by Level B harassment, animals hauled out at sites around the periphery of the base. Some rocket launches create overpressure at time of launch, and some recoveries of first-stage boosters can create a sonic boom when they return to the launch pad. Some flights also transit over or near portions of the NCI, but potential impacts to marine mammals at the NCI are discussed separately, below. Table 8 lists the proposed take by Level B harassment from rocket launch and recovery activities at VSFB, and below,

we describe how NMFS estimated take for each species. Note that northern fur seal and Guadalupe fur seal are not anticipated to occur at VSFB, and therefore, NMFS does not anticipate impacts to these species at VSFB.

#### Harbor Seals

Pacific harbor seals haul out regularly at more than ten sites on both north and south VSFB. They are the most widespread pinniped species on VSFB and have been seen in all months, with decades of successful pupping. Rocket launches from sites closer to the haulouts are more likely to cause

disturbance, including noise and visual impacts. Many of their haulout sites are inundated during high tide, and NMFS anticipates that take of this species would only occur during low tides. Rocket launches from sites closer to the haulouts are more likely to cause disturbance, including noise and visual impacts. However, to capture variability, we assume that all rocket launches result in Level B harassment of 100 percent of the harbor seals at all VSFB haulouts.

To determine the number of animals that would be taken by Level B harassment, we multiplied the max



count indicated in table 6 by the number of proposed launches per year (table 8) for each year of the proposed authorization. As noted in table 6, monitoring data show that, generally speaking, most if not all harbor seals exposed to launch noise exhibit a behavioral response to launch stimulus that equates to take by Level B harassment and, therefore, we predict that 100 percent of animals exposed to launch noise will be taken per launch. However, given that most haulout sites at VSFB are inundated at high tide, NMFS applied a 50 percent correction factor (table 7). Therefore, estimated takes = max daily count (149) X tidal correction factor (0.5) X number of rocket launches in the area for each year for each year (40 in year 1, *etc.*), and the resulting take numbers NMFS proposes to authorize are listed in table 8.

California Sea Lion

California sea lions on VSFB only haul out regularly at Rocky Point (north and south) and Amphitheatre Cove. California sea lions are most abundant at the haul out in Zone G at Lion Rock (Point Sal). Rocket launches from SLC-6, SLC-8, and the future SLC-11, which are closest to North Rocky Point, would be the most likely to result in noise and visual impacts. Rocket launches from SLC-3E and SLC-4E, both farther inland and some four times the distance, are less likely to impact California sea lions at North Rocky Point. During very high tides and strong winds, when spray is heavy, the sea lions often leave this site or are unable to access it. Therefore, NMFS assumes that for any given rocket launch at VSFB, 50 percent of the maximum number of California sea lions that haul out at VSFB may be taken by Level B harassment.

To determine the number of animals that would be taken by Level B harassment, we multiplied the max

count indicated in table 6 by the number of proposed launches per year (table 8) for each year of the proposed authorization. As noted in table 6, monitoring data show that, generally speaking, most if not all California sea lions hauled out at VSFB would exhibit a behavioral response to launch stimulus that equates to take by Level B harassment and, therefore, we predict that 100 percent of animals exposed to launch noise will be taken per launch. However, given that most haulout sites at VSFB are inundated at high tide, NMFS applied a 50 percent correction factor (table 7). Therefore, the number of estimated takes = max daily count (112) X tidal correction factor (0.5) X number of rocket launches in the area (40 in year 1, *etc.*), and the resulting take numbers NMFS proposes to authorize are listed in table 8.

Northern Elephant Seal

Northern elephant seals historically hauled out at VSFB only rarely, and most animals observed onsite were subadult males. In 2004, a record count of 188 animals was made, mostly newly weaned seals (MMCG and SAIC 2012a); these numbers continued to increase (unpublished data, however reported annually to NMFS). In November 2016, mature adults were observed in Amphitheatre Cove, and pupping was first documented in January 2017 with 18 pups born and weaned. In January 2018, a total of 25 pups were born and weaned; 26 in 2019, 34 in 2020, 33 in 2021 and 49 in 2022. Two pups were born and weaned at Boathouse Beach in both 2021 and 2022. We assume that this site, in addition to Amphitheatre, will support pupping in future years. Pupping occurs from December through March, with peak breeding in mid-February.

To determine the number of animals that would be taken by Level B harassment, we multiplied the max

count indicated in table 6 by the number of proposed launches per year (table 8) for each year of the proposed authorization. As noted in table 6, given elephant seals' known lack of sensitivity to noise, based on VSFB monitoring reports and the literature, NMFS predicts that only 15 percent of elephant seals exposed to the launch noise would respond in a manner that constitutes take by Level B harassment, and, therefore, a 15 percent correction factor was applied. We also note that, unlike for harbor seals and California sea lions, Northern elephant seal presence and numbers are not affected by tides. Therefore, the number of estimated takes = highest daily count (302) X behavioral harassment correction factor (0.15) X number of rocket launches in the area for each year (40 in year 1, *etc.*), and the resulting take numbers NMFS proposes to authorize are listed in table 8.

Steller Sea Lion

Steller sea lions have been observed at VSFB since April 2012 (MMCG and SAIC 2012c), though as indicated in table 6, they were not observed between 2020 and 2022. For purposes of estimating take, USSF estimates that up to five Steller sea lions may haul out at VSFB during any given launch. NMFS multiplied this number by the number of proposed launches per year for each year of the proposed authorization (Table 8). NMFS assumes that all rocket launches result in behavioral disturbance (*i.e.*, Level B harassment) of 100 percent of the Steller sea lions hauled out at VSFB. Therefore, the number of estimated takes = 5 animals X number of rocket launches in the area (40 in year 1, *etc.*), and the resulting take numbers NMFS proposes to authorize are listed in table 8.

TABLE 7—CORRECTIONS AND ADJUSTMENTS BY STOCK AT VSFB<sup>1 2</sup>

Stock	VSFB, tidal inundation correction (percent)	VSFB, behavioral disturbance correction (percent)
Harbor seal (California) .....	50	100
California sea lion (California) .....	50	100
Northern elephant seal (CA Breeding) .....	N/A	15
Steller sea lion (eastern) .....	N/A	100

<sup>1</sup> Northern elephant seals and Steller sea lion takes are adjusted to reflect observed species-specific reactivity to launch stimulus.  
<sup>2</sup> "N/A" indicates that no tidal adjustment was made.

TABLE 8—PROPOSED ANNUAL AND 5-YEAR INSTANCES OF INCIDENTAL TAKE FROM ROCKET LAUNCH AND RECOVERY ACTIVITIES AT VSFB

	2024	2025	2026	2027	2028	5-year total estimated takes
Number of Rocket Launches .....	40	55	75	100	110	.....
Pacific harbor seal (CA) .....	2,980	4,098	5,588	7,450	8,195	28,310
California sea lion (U.S.) .....	2,240	3,080	4,200	5,600	6,160	21,280
Northern elephant seal (CA breeding) .....	1,812	2,492	3,398	4,530	4,983	17,214
Steller sea lion (Eastern) .....	200	275	375	500	550	1,900

*UAS at VSFB*

As stated in the Description of Proposed Activity section, while harassment of hauled out pinnipeds from UAS classes 0–2 is unlikely to occur at altitudes of 200 ft and above (Erbe *et al.*, 2017; Pomeroy *et al.*, 2015; Sweeney *et al.*, 2016; Sweeney and Gelatt, 2017), USSF conservatively assumes that UAS classes 0–3 operations would take, by Level B harassment, some animals hauled out at Small Haul-Out 1 at VSFB. Aircraft are required to maintain a 1000-ft buffer around pinniped haul-out and rookery areas except in emergency circumstances, such as Search and Rescue. However, Small Haul-Out 1, has a reduced 500-ft buffer because pinnipeds using this particular site have acclimated to the activity. Therefore, a small number of takes by Level B harassment may result from UAS activity at Small Haul-Out 1, only. Table

9 lists the proposed take by Level B harassment at VSFB from UAS activities, and below, we describe how NMFS estimated take for each species. Note that northern fur seal and Guadalupe fur seal are not anticipated to occur at VSFB, and therefore, NMFS does not anticipate impacts to these species at VSFB. While Northern elephant seals have been observed on nearby beaches, only Pacific harbor seals and California sea lions are known to use Small Haul-Out 1, and therefore, these are the only species anticipated to be taken by UAS activities.

*Pacific Harbor Seal*

Pacific harbor seals are the most common species at Small Haul-Out 1. USSF estimates that up to six harbor seals may be taken by Level B harassment at Small Haul-Out 1 during any given UAS activity, based upon previous monitoring data at Small Haul-Out site 1. NMFS concurs, and

multiplied this number by the number of proposed UAS class 0–3 activities per year (100). Therefore, the number of estimated takes per year = 6 animals × 100 UAS activities, and the resulting take numbers NMFS proposes to authorize are listed in table 9.

*California Sea Lion*

California sea lions haul out at Small Haul-Out 1, though they are less abundant than Pacific harbor seal at that site. USSF estimates that up to 1 California sea lion may be taken by Level B harassment at Small Haul-Out 1 during any given UAS activity, based upon previous monitoring data at Small Haul-Out site 1. NMFS concurs, and multiplied this number by the number of proposed UAS class 0–3 activities per year (100). Therefore, the number of estimated takes per year = 1 animal × 100 UAS activities, and the resulting take numbers NMFS proposes to authorize are listed in table 9.

TABLE 9—TAKE BY LEVEL B HARASSMENT OF PINNIPEDS FROM UAS ACTIVITY

Species	Annual take by Level B harassment	5-year total take by Level B harassment
Pacific harbor seal .....	600	3,000
California sea lion .....	100	500

*Missiles at VSFB*

USSF oversees missile launches from seven locations on VSFB. The launches occur on a routine basis up to 15 times per year. In addition to originating from different locations than rockets, missile trajectories are also different. All missile launches tend in north-westerly direction, and missiles in flight transition to a near-horizontal profile shortly after launch. USSF's application describes that missile launches are not anticipated to result in take of pinnipeds at south VSFB, as they do not create a "boom." However, USSF anticipates, and NMFS concurs, that missile launches from sites in North Base could take California sea lions at Lion Rock (Point Sal), an off-base

location. Lion Rock (Point Sal) is the only site at which USSF anticipates that take of pinnipeds may occur during missile activities, and NMFS concurs. Lowry *et al.* (2021) provides marine mammal occurrence data at Lion Rock (Point Sal) for July 2016 and July 2017. While NMFS used more recent data (2020 to 2022) to estimate take of pinnipeds during rocket launch and UAS activities (described above), those surveys did not include Lion Rock (Point Sal), and therefore, NMFS has relied on the Lowry *et al.* (2021) data for missile launch impacts.

For purposes of estimating take, NMFS conservatively estimates that up to 518 California sea lions may haul out at Lion Rock (Point Sal) during any given missile launch. This is the higher

count of California sea lions at the site from 2016 (Lowry *et al.* 2021). NMFS multiplied this number by the number of proposed launches per year (15 launches). NMFS conservatively assumes that all California sea lions at the site would be taken by Level B harassment during any given missile launch, though it is relatively unlikely that all 15 launches would fly close enough to this site to cause Level B harassment. Therefore, the number of estimated takes = 518 animals × number of rocket launches in the area in a given year (15), and NMFS proposes to authorize 7,770 takes by Level B harassment of California sea lion annually (38,850 over the duration of the proposed authorization) from

missile launches at VSFB, as indicated in table 10.

TABLE 10—PROPOSED INSTANCES OF INCIDENTAL TAKE FROM MISSILE LAUNCHES (MILITARY READINESS ACTIVITY) AT VSFB

Species	Location	High count	Launches/year	Annual takes	5-year total takes <sup>1</sup>
California sea lion .....	Lion Rock, Point Sal .....	518 (2019)	15	7,770	38,850

<sup>1</sup> Annual take \* 5 years.

#### NCI

While USSF does not propose launching rockets from NCI, as noted previously, a subset of VSFB rocket launches transit over or near NCI, and a subset of those may create a sonic boom that affects some portion of pinniped haulouts on NCI (San Miguel and Santa Rosa). No take of pinnipeds on NCI is expected to result from missile launches or UAS activities. To estimate take of marine mammals at NCI resulting from rocket launches at VSFB, NMFS first estimated the number of hauled out animals per species across all potentially affected haulouts on San Miguel and Santa Rosa Islands. NMFS selected the high count from San Miguel and Santa Rosa Islands between 2017 and 2019 (NOAA Technical Memorandum SWFSC-656 (Lowry *et al.*, 2021) and summed the high counts from each site (table 11). NMFS then applied a correction factor to this

estimate to account for whether a given species is expected to be hauled out in the area during all or a portion of the year (table 12). This is referred to as Step 1 below.

Next, NMFS determined the approximate number of sonic booms over 2 psf anticipated to occur over the NCI (28 over 5 years, as reflected in USSF's application). USSF's application indicates that during previous monitoring of pinnipeds on NCI during rocket launches, few to no behavioral reactions that would qualify as Level B harassment using the the 3-point scale (table 5) were observed during sonic booms of less than 2 psf. Therefore, in estimating take herein, NMFS assumes that take of marine mammals will only occur during sonic booms of 2 psf or greater. Summarizing 20 years of sonic boom modeling (MMCG and SAIC, 2012a), we anticipate that no more than 25 percent of space launches will produce a sonic boom greater than 2 psf

over the NCI (estimated to be 28 launches over 5 years). On one occasion, pinnipeds on one side of San Miguel Island, reacted to a boom, while animals four miles away on the other did not react, nor was the boom detected there by acoustic instruments (MMCG and SAIC, 2012a). Therefore, NMFS multiplied the number of annual booms (table 13) by a 0.25 correction factor for all species and rounded each year up to the next whole number. This is referred to as step 2 below.

Next, NMFS multiplied the number of animals anticipated to be at a haulout during a launch (calculated in step 1) by the number of annual launches anticipated to affect animals at the haulouts (calculated in step 2), and then multiplied the product by the likelihood of a given species responding in a manner that would be considered take by Level B harassment (table 13). NMFS describes the calculations in further detail for each species, below.

TABLE 11—NCI, HIGH COUNT 2017–2019 FROM SWFSC-656

[Lowry *et al.* (2021)]

	2017	2019	High count from 2017 and 2019
Pacific harbor seal:			
San Miguel .....	230	254	254 (2019)
Santa Rosa .....	266	148	266 (2017)
Sum .....			520
California sea lion:			
San Miguel .....	49,252	60,277	60,277 (2019)
Santa Rosa .....	2,692	1,618	2,692 (2017)
Sum .....			62,969
Northern elephant seal:			
San Miguel .....	2,327	2,791	2,791 (2019)
Santa Rosa .....	1,169	1,015	1,169 (2017)
Sum .....			3,960
Northern fur seal:			
San Miguel .....	4,520	4,377	4,520 (2017)
Santa Rosa .....	N/R	N/R	N/R
Sum .....			4,520
Guadalupe fur seal:			
San Miguel .....	N/R	N/R	N/R
Santa Rosa .....	N/R	N/R	N/R
Sum .....			N/R
Steller sea lion:			

TABLE 11—NCI, HIGH COUNT 2017–2019 FROM SWFSC–656—Continued  
[Lowry *et al.* (2021)]

	2017	2019	High count from 2017 and 2019
San Miguel .....	N/R	N/R	N/R
Santa Rosa .....	N/R	N/R	N/R
Sum .....			5

**Note:** N/R: No sightings recorded.

#### Harbor Seals

For harbor seal, the sum of the high counts at the San Miguel and Santa Rosa haulouts during 2017 and 2019 is 520. NMFS expects Pacific harbor seals to occur at the haulouts year round, and therefore did not apply a correction for seasonal occurrence. NMFS multiplied the harbor seal haulout abundance (520) by the number of booms anticipated to overlap the haulouts (table 13, calculated in step 2 above). Based on years of monitoring reports showing the responses of harbor seals at NCI (which is farther from the launch sites than the VSFB sites) to launches, NMFS anticipates that 50 percent of harbor seals exposed to a sonic boom overlapping a haulout will be taken by Level B harassment. Therefore, for each year, the number of estimated takes = 520 animals  $\times$  number of sonic booms over 2 psf  $\times$  0.5, and the resulting take numbers NMFS proposes to authorize are listed in table 13.

#### California Sea Lions

For California sea lion, the sum of the high counts at the San Miguel and Santa Rosa haulouts during 2017 and 2019 is 62,969. While some California sea lions remain in the general vicinity of southern California throughout the year and may haul out onshore, the use of haulout sites at NCI is principally for breeding during peak summer months. Given the fact that most male sea lions and a substantial portion of all sea lions are not onshore at NCI outside of the breeding season, we applied a 50 percent correction factor to better relate instances of take to the number of individuals that may be hauled out and subject to acoustic effects of launches. NMFS multiplied the California sea lion haulout abundance (62,969) by the number of booms anticipated to overlap

the haulouts (Table 13, calculated in Step 2 above). Based on years of monitoring reports showing the responses of California sea lions at NCI to launches, NMFS anticipates that 25 percent of California sea lions exposed to a sonic boom overlapping a haulout will be taken by Level B harassment. Therefore, for each year, the number of estimated takes = 62,969 animals  $\times$  number of sonic booms over 2 psf  $\times$  0.25, and the resulting take numbers NMFS proposes to authorize are listed in table 13.

#### Northern Elephant Seals

For Northern elephant seal, the sum of the high counts at the San Miguel and Santa Rosa haulouts during 2017 and 2019 is 3,960. NMFS expects Northern elephant seals to occur at the haulouts year round, and therefore did not apply a correction for seasonal occurrence. NMFS multiplied the Northern elephant seal haulout abundance (3,960) by the number of booms anticipated to overlap the haulouts (table 13, calculated in step 2 above). Based on years of monitoring reports showing the responses of Northern elephant seals at NCI to launches, NMFS anticipates that 5 percent of Northern elephant seals exposed to a sonic boom overlapping a haulout will be taken by Level B harassment. Therefore, for each year, the number of estimated takes = 3,960 animals  $\times$  number of sonic booms over 2.0 psf  $\times$  0.05, and the resulting take numbers NMFS proposes to authorize are listed in table 13.

#### Northern Fur Seal

For Northern fur seal, the sum of the high counts at the San Miguel and Santa Rosa haulouts during 2017 and 2019 is 4,377. Northern fur seals spend approximately 80 percent of the year at

sea, generally well offshore (Carretta *et al.*, 2011; Carretta *et al.*, 2012). To account for that seasonal occurrence, NMFS applied a conservative seasonal correction factor of 60 percent. NMFS multiplied the Northern fur seal haulout abundance (4,377) by the number of booms anticipated to overlap the haulouts (table 13, calculated in step 2 above). Based on years of monitoring reports showing the responses of Northern fur seals at NCI to launches, NMFS anticipates that 5 percent of Northern fur seals exposed to a sonic boom overlapping a haulout will be taken by Level B harassment. Therefore, for each year, the number of estimated takes = 4,377 animals  $\times$  number of sonic booms over 2 psf  $\times$  0.05, and the resulting take numbers NMFS proposes to authorize are listed in table 13.

#### Guadalupe Fur Seal

For Guadalupe fur seal, the sum of the high counts at the San Miguel and Santa Rosa haulouts during 2017 and 2019 is 5. NMFS estimates the potential for Guadalupe fur seals to occur at the haulouts to be comparable throughout the year and, therefore, did not apply a correction for seasonal occurrence. NMFS multiplied the Guadalupe fur seal haulout abundance (5) by the number of booms anticipated to overlap the haulouts (table 13, calculated in step 2 above). Based on years of monitoring reports showing the responses of Guadalupe fur seals at NCI to launches, NMFS anticipates that 50 percent of Guadalupe fur seals exposed to a sonic boom overlapping a haulout will be taken by Level B harassment. Therefore, for each year, the number of estimated takes = 5 animals  $\times$  number of sonic booms over 2 psf  $\times$  0.5, and the resulting take numbers NMFS proposes to authorize are listed in table 13.

TABLE 12—CORRECTIONS AND ADJUSTMENTS BY STOCK AT NCI<sup>1 2</sup>

Species	Species response to sonic boom (percent)	Seasonal occurrence (percent of year)
Harbor seal .....	50	100
California sea lion .....	25	50
Northern elephant seal .....	5	100
Northern fur seal .....	25	<sup>3</sup> 60
Guadalupe fur seal .....	50	<sup>4</sup> N/A

<sup>1</sup> Northern elephant seals and Steller sea lion takes are adjusted to reflect observed species-specific reactivity to launch stimulus.

<sup>2</sup> “N/A” indicates that a species is not expected to occur at the location.

<sup>3</sup> Of note, from November to May, there are approximately 125 individuals at the NCI (S. Melin, 2019), further supporting a seasonal correction factor.

<sup>4</sup> Guadalupe fur seal are generally not expected to occur on the NCI. However, as described herein, given that they have occasionally been sighted on the NCI, NMFS is conservatively proposing to authorize take of Guadalupe fur seal as described herein.

TABLE 13—PROPOSED TAKE BY LEVEL B HARASSMENT AT NCI  
[San Miguel and Santa Rosa]

	2024	2025	2026	2027	2028	5-year total take
Maximum number of sonic booms .....	5	12	24	30	33	.....
Maximum number of sonic booms over 2.0 psf .....	2	3	6	8	9	.....
Pacific harbor seal .....	520	780	1,560	2,080	2,340	7,280
California sea lion .....	15,742	23,613	47,227	62,969	70,840	220,392
Northern elephant seal .....	396	594	2,970	3,960	4,455	12,375
Northern fur seal .....	1,313	1,970	3,939	5,252	5,909	18,383
Guadalupe fur seal .....	5	8	15	20	23	70

#### Total Proposed Take

Table 14 sums the take estimates described above for VSFB (rocket launches, missile launches, and UAS) and NCI (rocket launches only). These takes represent the number of instances

of harassment of pinnipeds following exposure to the indicated activities. However, every take does not necessarily, and in this case is not expected to, represent a separate individual. Rather, given the known repeated use of haulouts by pinnipeds

of all species, it is reasonable to expect that some subset of the calculated takes represent repeated takes of the same individuals, which means that the number of individuals taken is expected to be significantly smaller than the number of instances of take.

TABLE 14—TOTAL ESTIMATED ANNUAL AND 5-YEAR TAKE<sup>1</sup> PROPOSED FOR AUTHORIZATION

Stock	2024	2025	2026	2027	2028	Highest 1-year take estimated	Stock abundance	Highest annual instances of take as percent of stock abundance
Pacific harbor seal .....	4,100	5,478	7,748	10,130	11,135	11,135	30,968	36
California sea lion .....	25,852	34,563	59,297	76,439	84,870	84,870	257,606	33
Northern elephant seal .....	2,208	3,086	6,368	8,490	9,438	9,438	187,386	5
Steller sea lion .....	200	275	375	500	550	550	43,201	1
Northern fur seal .....	1,313	1,970	3,939	5,252	5,909	5,909	14,050	42
Guadalupe fur seal .....	5	8	15	20	23	23	34,187	0

<sup>1</sup> Given the known repeated use of haulouts by pinnipeds of all species, it is reasonable to expect that some subset of the calculated takes represent repeated takes of the same individuals, which means that the number of individuals taken is expected to be significantly smaller than the number of instances of take.

#### Proposed Mitigation

In order to issue regulations and an LOA under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations

require applicants to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the 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)). The NDAA for Fiscal Year 2004 amended the MMPA as it relates to military readiness activities and the incidental take authorization process such that “least practicable impact” shall include consideration of

personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, NMFS considers two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is

expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost and impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Below, we describe the proposed mitigation measures for launches (rocket and missile), manned aircraft, and UAS.

#### *Launches (Rocket and Missile)*

USSF must provide pupping information to launch proponents at the earliest possible stage in the launch planning process to maximize their ability to schedule launches to minimize pinniped disturbance during pupping seasons on VSFB from 1 March to 30 April and on the Northern Channel Islands from 1 June–31 July. If practicable, rocket launches predicted to produce a sonic boom on the Northern Channel Islands >3 psf from 1 June–31 July will be scheduled to coincide with tides in excess of +1.0 ft, with an objective to do so at least 50 percent of the time. USSF will provide a detailed plan to NMFS for approval that outlines how this measure will be implemented. This measure will minimize occurrence of launches during low tides when harbor seals and California sea lions are anticipated to haul out in the greatest numbers during times of year when pupping may be occurring, therefore further reducing the already unlikely potential for separation of mothers from pups and potential for injury during stampedes. While harbor seal pupping extends through June, harbor seals reach full size at approximately two months old, at which point they are less vulnerable to disturbances. In consideration of that and practicability concerns raised by USSF, this measure does not extend through the later portion of the harbor seal pupping season at VSFB.

#### *Manned Aircraft*

For manned flight operations, aircraft must use approved routes for testing and evaluation. Manned aircraft must

also remain outside of a 1,000-ft buffer around pinniped rookeries and haul-out sites (except in emergencies such as law enforcement response or Search and Rescue operations, and with a reduced, 500-ft buffer at Small Haul-out 1). As discussed earlier, use of these routes and implementation of the buffer would avoid behavioral disturbance of marine mammals from manned aircraft operations.

#### *UAS*

UAS classes 0–2 must maintain a minimum altitude of 300 ft over all known marine mammal haulouts when marine mammals are present, except at take-off and landing. Class 3 must maintain a minimum altitude of 500 ft, except at take-off and landing. UAS classes 4 and 5 only operate from the VSFB airfield and must maintain a minimum altitude of 1,000 ft over marine mammal haulouts except at take-off and landing. USSF must not fly class 4 or 5 UAS below 1,000 ft over haulouts.

Based on our evaluation of the applicant's proposed measures, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

#### **Proposed Monitoring and Reporting**

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present while conducting the activities. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (e.g., presence, abundance, distribution, density);
- 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 activity; 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 other important physical components of marine mammal habitat); and,

- Mitigation and monitoring effectiveness.

The USSF has proposed a suite of monitoring measures on both VSFB and the NCI to document impacts of the specified activities on marine mammals. These proposed monitoring measures include both routine, semi-monthly counts at all haul out sites on VSFB, and launch-specific monitoring at VSFB and/or NCI when specific criteria are met. For monitoring at VSFB and NCI, monitoring must be conducted by at least one NMFS-approved PSO trained in marine mammal science. PSOs must have demonstrated proficiency in the identification of all age and sex classes of both common and uncommon pinniped species found at VSFB and the NCI. They must be knowledgeable of approved count methodology and have experience in observing pinniped behavior, especially that due to human disturbances, to document pinniped activity at the monitoring site(s) and to record marine mammal response to base operations. In the event that the requirement for PSO monitoring cannot be met (such as when access is prohibited due to safety concerns), daylight or night-time video monitoring may be used in lieu of PSO monitoring. Specific requirements for monitoring locations at VSFB and NCI respectively, are described in additional detail below.

#### *Rocket Launch Monitoring at VSFB*

At VSFB, USSF must conduct marine mammal monitoring and take acoustic measurements for all new rockets (for both existing and new launch proponents using the existing facilities) that are larger or louder than those that

have been previously launched from VSFB during their first three launches, and for the first three launches from any new facilities during March through July (*i.e.*, the period during which harbor seals are pupping occurs and California sea lions are present).

For the purposes of establishing monitoring criteria for VSFB haulouts, computer software is used to model sound pressure levels anticipated to occur for a given launch and/or recovery. Sonic boom modeling will be performed prior to the first three small or medium rocket launches from new launch proponents or at new launch facilities, and all heavy or super-heavy rocket launches. PCBoom, a commercially available modeling program, or an acceptable substitute, will be used to model sonic booms from new vehicles.

Launch parameters specific to each launch will be incorporated into each model run, including: launch direction and trajectory, rocket weight, length, engine thrust, engine plume drag, and launch profile (vehicle position versus time from launch to first-stage burnout), among other aspects. Various weather scenarios will be analyzed from NOAA weather records for the region, then run through the model. Among other factors, these will include the presence or absence of the jet stream, and if present, its direction, altitude and velocity. The type, altitude, and density of clouds will also be considered. From these data, the models will predict peak amplitudes and impacted locations. As described below, this approach is also used to assess whether thresholds (Table 16) for marine mammal monitoring on NCI could be exceeded or not, and whether marine mammal monitoring will be necessary for animals hauled out at NCI.

In general, on both VSFB and NCI, event-specific monitoring typically involves four to six observations of each significant haul-out area each day, over a period of 3 to 5 hours. For launches that occur during the harbor seal pupping season (March 1 through June 30) or when higher numbers of California sea lions are present (June 1 through July 31), monitoring will be conducted by at least one NMFS-approved protected species observer (PSO) trained in marine mammal science. Authorized PSOs shall have demonstrated proficiency in the identification of all age and sex classes of all marine mammal species that occur at VSFB. They shall be knowledgeable of approved count methodology and have experience in observing pinniped behavior, especially that due to human disturbances.

When launch monitoring is required, monitoring will begin at least 72 hours prior to the launch and continue through at least 48 hours after the launch. For launches within the harbor seal pupping season, a two-week follow-up pup survey will be required to ensure that there were no adverse effects to pups. During daylight monitoring, time-lapse video recordings will be made to capture the reactions of pinnipeds to each launch, and during nighttime monitoring, USSF will employ night video monitoring, when feasible. Monitoring will include multiple surveys each day. When possible, PSOs will record: species, number, general behavior, presence of pups, age class, gender, and reaction to launch noise, or to natural or other human-caused disturbances. They will also record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

NCI Launch Monitoring

USSF will conduct marine mammal monitoring and take acoustic measurements at the NCI if the sonic boom model indicates that pressures from a boom will reach or exceed the psf level detailed in table 15 during the indicated date range. These dates were determined to be appropriate to account for sensitive seasons, primarily pupping, for the various pinniped species.

TABLE 15—PROPOSED NCI SONIC BOOM LEVEL REQUIRING MONITORING, BY DATE

Dates	Sonic boom level
1 March–31 July .....	>5 psf.
1 August–30 September .....	>7 psf.
1 October–28 February .....	no monitoring.

USSF will use specialized acoustic instruments to record sonic booms generated by launches from VSFB and resulting overflights or recoveries predicted to affect NCI haul out sites. VSFB will analyze the recordings to determine the intensity, duration, and frequency of sonic booms and resulting marine mammal responses in order to compare monitoring results with levels considered potentially harmful to marine mammals. The analysis can also be used to validate the efficacy of the model.

Monitoring locations on NCI will be selected based upon the model results, prioritizing a significant haulout site on one of the islands where the maximum sound pressures are expected to occur.

Currently, monitoring the reactions of northern fur seals and Pacific harbor seals to sonic booms is of a higher priority than monitoring of California sea lions and northern elephant seals, for which more data is currently available (Table 8). Monitoring the reactions of mother-pup pairs of any species is also a high priority.

Considering the large numbers of pinnipeds (sometimes thousands) that occur on some NCI beaches, while estimates of the entire beach population will be made and their reactions to the launch noise noted, more focused and detailed monitoring will be conducted on a smaller subset or focal group. Photos and/or video recordings will be collected for daylight launches when feasible, and if the launch occurs in darkness night vision equipment will be used. Potential impediments to effective use of photographic and video equipment include periods of reduced visibility, terrain that obscures animals from view from one observation point, severe glare and fog that can occur, and/or other factors.

Monitoring will be conducted by at least one NMFS-approved PSO who is trained in marine mammal science. Another person will accompany the monitor for safety reasons. Monitoring will commence at least 72 hours prior to the launch, during the launch and at least 48 hours after the launch, unless no sonic boom is detected by the monitors and/or by the acoustic recording equipment, at which time monitoring would be stopped. If the launch occurs in darkness, night vision equipment will be used. Monitoring for each launch will 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. Photos and/or video recordings will be taken when feasible. Environmental conditions will also be recorded, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

USSF will continue to test equipment and emerging technologies, including but not limited to night vision cameras, newer models of remote video cameras and other means of remote monitoring at both VSFB and on the NCI. UAS-based or space-based technologies that may become available will be evaluated for suitability and practicability, and for any advantage that remote sensing may provide to existing monitoring approaches, including ensuring coverage when scheduling constraints or other factors impede onsite monitoring at NCI.



### *Missile Launch Monitoring*

Multiple years of monitoring indicates that missile launches do not result in significant take (*i.e.*, only a subset of pinnipeds, in the vicinity of the launch trajectory, respond in a manner that would qualify as a take, and the impacts appear comparatively minor and of short duration). Therefore, monitoring of marine mammals is only required for the first three launches of the missiles for the new GBSD during the months of March through July (*i.e.*, the period during which harbor seals are pupping and California sea lions are present) across the 5-year duration of this rule.

When missile launch monitoring is required, monitoring will include multiple surveys each day. When possible, PSOs will record: species, number, general behavior, presence of pups, age class, gender, and reaction to launch noise, or to natural or other human-caused disturbances. They will also record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

### *USSF Semi-Monthly Sentinel Surveys*

USSF conducts marine mammal surveys on a regular basis in addition to the monitoring that is required based on launch characteristics and sound pressure thresholds, described above. These regular surveys help characterize onsite trends in pinniped presence and abundance and, over the longer term, provide important context for interpreting seasonal trends and launch-specific monitoring results. The current monthly surveys have allowed researchers to assess haul-out patterns and relative abundance over time, presenting a better picture of pinniped population trends at VSFB and whether USSF operations are resulting in cumulative impacts. For the period of this LOA, and in conjunction with proposed changes of monitoring criteria for launches, the applicant proposes to change the frequency of sentinel surveys from monthly to semi-monthly (two surveys per month).

Past surveys have captured important data including novel occurrences (such as unsuccessful California sea lion pupping on VSFB in 2003 and northern elephant seal pupping in 2017) and emerging or fleeting trends (such as greater numbers of northern elephant seals hauling out in 2004, and a temporary increase in California sea lions onsite in 2018 and 2019). These results, in conjunction with anticipated changes in launch activity and environmental factors underscore the value of consistent surveys collected on

a regular basis, to provide sound context for launch-specific monitoring results.

USSF will conduct semi-monthly surveys (two surveys per month, rather than the current monthly surveys) to monitor the abundance, distribution, and status of pinnipeds at VSFB. Whenever possible, these surveys will be timed to coincide with the lowest afternoon tides of each month when the greatest numbers of animals are usually hauled out. South VSFB surveys start about two hours before the low tide and end two hours afterward. North VSFB surveys are either conducted by a separate surveyor on the same day as south VSFB, or on the day before/after south VSFB surveys. North VSFB surveys require approximately 90 minutes. Monitoring during nighttime low tides is not possible because of the dangerously unstable nature of the bluffs overlooking many of the observation points. Occasional VSFB or area closures also sometimes preclude monitoring on a given day, in which case the next best day will be selected.

NMFS-approved PSOs will gather the following data at each site: species, number, general behavior, presence of pups, age class, gender, and any reactions to natural or human-caused disturbances. They will also record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

### *Adaptive Management*

The regulations governing the take of marine mammals incidental to launches and supporting activities at VSFB contain an adaptive management component. Our understanding of the effects of launches and supporting activities (*e.g.*, acoustic and visual stressors) on marine mammals continues to evolve, which makes the inclusion of an adaptive management component both valuable and necessary within the context of 5-year regulations.

The reporting requirements associated with this rule are designed to provide NMFS with monitoring data from the previous year to allow NMFS to consider whether any changes to existing mitigation, monitoring or reporting requirements are appropriate. The use of adaptive management also allows NMFS to consider new information from different sources to determine (with input from the USSF 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 will have a reasonable

likelihood of more effectively accomplishing the goals of the mitigation and monitoring and if the measures are practicable. If the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS will publish a notice of the planned LOA in the **Federal Register** and solicit public comment.

### *Reporting*

Proposed reporting requirements would include launch monitoring reports for each launch where monitoring is required or conducted, annual reports describing all activities and monitoring conducted in the project area that are covered under this proposed rule during each year, and a comprehensive 5-year report.

A launch monitoring report containing the following information would be submitted to NMFS within 90 days after each rocket launch where monitoring is required:

- Date(s) and time(s) of the launch (and sonic boom, if applicable);
- Monitoring program design; and
- Results of the monitoring program, including, but not necessarily limited to:
  - Date(s) and location(s) of marine mammal monitoring;
  - Number of animals observed, by species, on the haulout prior to commencement of the launch or recovery;
  - General behavior and, if possible, age (including presence of pups) and sex class of pinnipeds hauled out prior to the launch or recovery;
  - Number of animals, by species, age, and sex class, that responded at a level indicative of harassment;
  - Number of animals, by species, age, and sex class that entered the water, and any behavioral responses by pinnipeds that were likely in response to the specified activities, including in response to launch noise or a sonic boom;
  - Environmental conditions including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction; and
  - Results of acoustic monitoring, including the recorded sound levels associated with the launch and/or sonic boom (if applicable).

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.

USSF must submit an annual report to NMFS on March 1st of each year that summarizes 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 include the results of the semi-monthly sentinel marine mammal monitoring and describe any documented takings incidental to the specified activities not included in the launch reports (*e.g.*, takes incidental to aircraft or helicopter operations observed during the semi-monthly surveys).

A final comprehensive 5-year 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 assess any cumulative impacts on marine mammals from the specified activities.

#### 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 impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), 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 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, this introductory discussion of our analysis applies to all the species listed in table 3, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, they are described independently in the analysis below.

Activities associated with the proposed activities, as outlined previously, have the potential to disturb and temporarily displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment only, from airborne sounds resulting from launches and recoveries, including sonic booms from certain launches and sound or visual stimuli from UAS operations. Based on the best available information, including monitoring reports from similar activities conducted at the site, the Level B harassment of pinnipeds would likely be limited to reactions such as moving a short distance, with some hauled out animals moving toward or entering the water for a period of time following the disturbance.

As mentioned previously, different species of marine mammals and different conditions at haul out sites can result in different degrees of response from the animals. Sufficient data collected onsite can be used to characterize the relative tendency of species to react to acoustic disturbance and, specifically, to noise from VSFB launches and operations.

These distinctions in species response are discussed above in the Potential Effects of Specified Activities on Marine Mammals and Their Habitat section, and correction factors for species sensitivity are applied to the take estimates provided in this document.

As discussed earlier, Level B harassment of pinnipeds from rocket and missile launch activities or UAS exposure is primarily expected to be of relatively short duration, in the form of changing position, direction, or location on the haulout or, on a subset of occasions, flushing into the water for some amount of time (up to a few hours). UAS flights would be conducted in accordance with minimum altitude requirements designed to minimize impacts over haulouts and planning measures are in place to minimize launch effects to pinnipeds on beaches where pupping is occurring. Given the potential for seasonal site fidelity, it is

likely that some individuals will be taken multiple times during the course of the year as a result of exposure to multiple launches, and potentially UAS overflights. However, given the intermittency of the launches and the fact that they do not all originate from the same location, these repeated exposures are not expected to result in prolonged exposures over multiple days. 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 of 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.

As discussed earlier, some of the beaches that may be impacted by launch activities and UAS overflights support pupping in some months, specifically for harbor seals (March through June on VSFB and NCI), California sea lions (May through August on NCI), elephant seal (January through March on VSFB and December through March on NCI), and northern fur seal (June through August on San Miguel Island, NCI).

Broadly speaking, flushing of pinnipeds into the water has the potential to result in mother-pup separation, or in extreme circumstances 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 monitoring pinniped response to launch noise at VSFB and the NCI, no serious injury or mortality of marine mammals is anticipated as a result of the proposed activities. Further, USSF is required to provide pupping information to launch proponents at the earliest possible stage in the launch planning process, to maximize their ability to schedule launches to minimize pinniped disturbance during Pacific harbor seal pupping on Vandenberg SFB (1 March to 30 April) and California sea lion pupping on the Northern Channel Islands (1 June-31 July of each year). If practicable, rocket launches predicted to produce a sonic boom on the Northern Channel Islands >5 psf during the California sea lion pupping season will be scheduled to coincide with tides in excess of +1.0 ft, with an objective to achieve such avoidance at least 50 percent of the time which is expected to minimize the impacts at places and times where pupping could be occurring. Even in the instances of pinnipeds being harassed by sonic booms from rocket launches at VSFB, no

evidence of abnormal behavior, injuries or mortalities, or pup abandonment as a result of sonic booms (SAIC 2013; CEMML, 2018) has been presented. These findings are supported by more than two decades of surveys at VSFB 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 and of note, research on abundance and fecundity has been conducted at San Miguel Island (recognized as an important pinniped rookery) for decades. This research, as well as SARs, support a conclusion that operations at VSFB have not had significant impacts on the numbers of animals observed at San Miguel Island rookeries and haulouts (SAIC, 2012). In addition, northern elephant seal pupping was documented on VSFB for the first time in 2017 and continued into 2022, further indicating that the effects of ongoing launch activities do not preempt new marine mammal activity and are unlikely to have impacted annual rates of recruitment or survival among affected species.

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 instances 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 60–120 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 previously, only take of small numbers of marine mammals may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. Here, a small portion of the activities (missile launches only) are considered military readiness activities, but we have conducted the assessment considering the totality of the take considered for this proposed rule. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the maximum number of individuals taken in any year 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. When the predicted maximum annual number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. See 86 FR 5438–5440, January 19, 2021. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities. Here, we considered the tendency to show site fidelity among affected species, their seasonal distribution trends and the likelihood of individual animals being disturbed repeatedly (*i.e.*, taken by multiple launches across multiple days within a year), rather than proceeding as though each instance of take affecting a different individual.

For every year, the instances of take proposed for authorization of northern elephant seal, Steller sea lion, and Guadalupe fur seal comprise less than one-third of the best available population abundances (table 14). The number of animals authorized to be taken from these stocks would be considered small relative to the relevant stock's abundances even if each estimated instance of take occurred to a new individual, which is an unlikely scenario.

For harbor seals and California sea lions (years 4 and 5 only), and Northern fur seals (years 3, 4, and 5 only), the highest annual estimated instances of take are greater than or equal to one-third of the best available stock abundance (36, 33, and 42 percent, respectively). However, as noted previously, the number of expected instances of take do not necessarily represent the number of individual animals expected to be taken. The same

individual can incur multiple takes by Level B harassment over the course of an activity that occurs multiple times in the same area (such as the USSF's proposed activity) and especially where species have documented site fidelity to a location within the project area, as is the case here. Additionally, due to the nature of the specified activity—launch activities affecting animals at specific haul out locations, rather than a mobile activity occurring throughout the much larger stock range—only a much smaller portion of the stock would be expected to be impacted. Thus, while we propose to authorize the instances of incidental take of these species shown in table 14, the number of individuals that would be incidentally taken by the proposed activities would, in fact, be substantially lower than the authorized instances of take, and less than one third of the stock abundance for each of these species. 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.

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 would 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.

### Endangered Species Act

Section 7(a)(2) of the ESA 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 whenever we propose to authorize take for endangered or threatened species, in this case with the NMFS Southwest Fisheries Science Center.

NMFS is proposing to authorize a limited amount of take, by Level B harassment (5–23 annually, 70 over the

course of the 5-year rule), of Guadalupe fur seals which are listed as Threatened under the ESA. On December 20, 2023, NMFS' West Coast Regional Office concurred with OPR's determination that USSF's proposed activities are consistent with those addressed by the region's February 15, 2019 letter of concurrence for the current LOA, and are not likely to adversely affect the Guadalupe fur seal.

#### National Marine Sanctuaries Act

Federal agency actions that are likely to injure national marine sanctuary resources are subject to consultation with the Office of National Marine Sanctuaries (ONMS) under section 304(d) of the National Marine Sanctuaries Act (NMSA). While rocket and missile launches do not occur in national marine sanctuary waters, depending on the direction of a given launch, rockets and missiles may cross over the Channel Islands National Marine Sanctuary. NMFS will work with NOAA's Office of National Marine Sanctuaries to fulfill our responsibilities under the NMSA as warranted and will complete any NMSA requirements prior to a determination on the issuance of the final rule and LOA.

#### National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NAO 216–6A, NMFS must review its proposed action (*i.e.*, the issuance of an ITA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (ITAs with no anticipated serious injury or mortality) 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 issuance of the proposed ITA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the ITA request.

#### Request for Information

NMFS requests interested persons to submit comments, information, and suggestions concerning the USSF 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 notice 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 USSF is the sole entity that would be subject to the requirements in these proposed regulations, and the USSF 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. This rule does not contain a collection-of-information requirement subject to the provisions of the Paperwork Reduction Act 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 19, 2024.

**Samuel D. Rauch III**,  
Deputy Assistant Administrator for  
Regulatory Programs, National Marine  
Fisheries Service.

#### 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. Space Force Launches and Operations at Vandenberg Space Force Base, California

Sec.

217.60 Specified activity and specified  
geographical region.

217.61 Effective dates.

217.62 Permissible methods of taking.  
217.63 Prohibitions.  
217.64 Mitigation requirements.  
217.65 Requirements for monitoring and  
reporting.  
217.66 Letters of Authorization.  
217.67 Renewals and modifications of  
Letter of Authorization. 217.68–217.69  
[Reserved]

#### § 217.60 Specified activity and specified geographical region.

(a) Regulations in this subpart apply only to the United States Space Force (USSF) 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 incidental to rocket and missile launches and supporting operations.

(b) The incidental taking of marine mammals under these regulations may be authorized in a Letter of Authorization (LOA) only for activities originating at Vandenberg Space Force Base (VSFB).

#### § 217.61 Effective dates.

(a) Regulations in this subpart are effective from April 10, 2024, through April 10, 2029.

(b) [Reserved]

#### § 217.62 Permissible methods of taking.

(a) Under an LOA issued pursuant to § 216.106 of this chapter and §§ 217.66 or 217.67, the Holder (hereinafter the USSF) may incidentally, but not intentionally, take marine mammals by Level B harassment, as described in § 217.60(a) and (b), provided the activity is in compliance with all terms, conditions, and requirements of the regulations in this subpart and the appropriate LOA.

(b) The incidental take of marine mammals by the activities listed in § 217.60 is limited to the following species and stocks:

TABLE 1 TO § 217.62(b)

Species	Stock
California sea lion .....	United States.
Northern fur seal .....	California.
Guadalupe fur seal .....	Mexico.
Steller sea lion .....	Eastern.
Harbor seal .....	California.
Northern elephant seal ...	California Breeding.

#### § 217.63 Prohibitions.

(a) Except for takings contemplated in § 217.62 and authorized by a LOA issued under § 216.106 of this chapter and §§ 217.66 and 217.67, it shall be unlawful for any person to do any of the following in connection with the activities listed in § 217.60:

(1) Violate, or fail to comply with, the terms, conditions, and requirements of

this subpart or a LOA issued under §§ 216.106 of this chapter and §§ 217.66 or 217.67 of this chapter;

(2) Take any marine mammal species or stock not specified in such LOAs;

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

(4) Take a marine mammal specified in such LOAs if NMFS determines after notice and comment that the taking allowed for one or more activities under 16 U.S.C. 1371(a)(5)(A) is having or may have more than a negligible impact on the species or stocks of such marine mammal.

(b) [Reserved]

#### § 217.64 Mitigation requirements.

(a) When conducting the activities identified in § 217.60(a) and (b), the mitigation measures contained in any Letter of Authorization issued under § 216.106 of this chapter and §§ 217.66 or 217.67 must be implemented. These mitigation measures include (but are not limited to):

(1) USSF must provide pupping information to launch proponents at the earliest possible stage in the launch planning process and direct launch proponents to, if practicable, avoid scheduling launches during pupping seasons on VSFB from 1 March to 30 April and on the Northern Channel Islands from 1 June–31 July. If practicable, rocket launches predicted to produce a sonic boom on the Northern Channel Islands >3 psf from 1 June–31 July will be scheduled to coincide with tides in excess of +1.0 ft, with an objective to do so at least 50 percent of the time.

(2) For manned flight operations, aircraft must use approved routes for testing and evaluation. Manned aircraft must also remain outside of a 1,000-ft buffer around pinniped rookeries and haul-out sites (except in emergencies such as law enforcement response or Search and Rescue operations, and with a reduced, 500-ft buffer at Small Haul-out 1).

(3) UAS classes 0–2 must maintain a minimum altitude of 300 ft over all known marine mammal haulouts when marine mammals are present, except at take-off and landing. Class 3 must maintain a minimum altitude of 500 ft, except at take-off and landing. UAS classes 4 and 5 only operate from the VSFB airfield and must maintain a minimum altitude of 1,000 ft over marine mammal haulouts except at take-off and landing. USSF must not fly class 4 or 5 UAS below 1,000 ft over haulouts.

(b) [Reserved]

#### § 217.65 Requirements for monitoring and reporting.

(a) Monitoring at VSFB and NCI must be conducted by at least one NMFS-approved Protected Species Observer (PSO) trained in marine mammal science. PSOs must have demonstrated proficiency in the identification of all age and sex classes of all marine mammal species that occur at VSFB and on NCI. They must be knowledgeable of approved count methodology and have experience in observing pinniped behavior, especially that due to human disturbances.

(b) In the event that the PSO requirements described in paragraph (a) of this section cannot be met (*e.g.*, access is prohibited due to safety concerns), daylight or night-time video monitoring may be used in lieu of PSO monitoring.

(c) At VSFB, USSF must conduct marine mammal monitoring and take acoustic measurements for all new rockets (for both existing and new launch proponents using the existing facilities) that are larger or louder than those that have been previously launched from VSFB during their first three launches and for the first three launches from any new facilities during March through July.

(1) For launches that occur during the harbor seal pupping season (March 1 through June 30) or when higher numbers of California sea lions are present (June 1 through July 31), monitoring must be conducted by at least one NMFS-approved PSO trained in marine mammal science.

(2) When launch monitoring is required, monitoring must begin at least 72 hours prior to the launch and continue through at least 48 hours after the launch. Monitoring must include multiple surveys each day.

(3) For launches within the harbor seal pupping season, USSF must conduct a follow-up survey of pups.

(4) For launches that occur during daylight, USSF must make time-lapse video recordings to capture the reactions of pinnipeds to each launch. For launches that occur at night, USSF will employ night video monitoring, when feasible.

(5) When possible, PSOs must record: species, number, general behavior, presence and number of pups, age class, gender, and reaction to launch noise, or to natural or other human-caused disturbances. PSOs must also record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

(d) USSF must conduct sonic boom modeling prior to the first three small or

medium rocket launches from new launch proponents or at new launch facilities, and all heavy or super-heavy rocket launches.

(e) USSF must conduct marine mammal monitoring and take acoustic measurements at the NCI if the sonic boom model indicates that pressures from a boom will reach or exceed 5 psf from 1 March through 31 July or 7 psf from 1 August through 30 September. No monitoring is required on NCI from 1 October through 28 February.

(1) The monitoring site must be selected based upon the model results, prioritizing a significant haulout site on one of the islands where the maximum sound pressures are expected to occur.

(2) USSF must estimate the number of animals on the monitored beach and record their reactions to the launch noise and conduct more focused monitoring on a smaller subset or focal group.

(3) Monitoring must commence at least 72 hours prior to the launch, during the launch and at least 48 hours after the launch, unless no sonic boom is detected by the monitors and/or by the acoustic recording equipment, at which time monitoring may be stopped.

(4) For launches that occur in darkness, USSF must use night vision equipment.

(5) Monitoring for each launch must 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.

(6) USSF must collect photo and/or video recordings for daylight launches when feasible, and if the launch occurs in darkness night vision equipment will be used.

(7) USSF must record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

(f) USSF must continue to test equipment and emerging technologies, including but not limited to night vision cameras, newer models of remote video cameras and other means of remote monitoring at both VSFB and on the NCI.

(g) USSF must evaluate UAS based on space-based technologies that become available for suitability, practicability, and for any advantage that remote sensing may provide to existing monitoring approaches.

(h) USSF must monitor marine mammals during the first three launches of the missiles for the new Ground Based Strategic Defense program during

the months of March through July across the 5-year duration of this rule.

(1) When launch monitoring is required, monitoring must include multiple surveys each day.

(2) When possible, PSOs must record: species, number, general behavior, presence and number of pups, age class, gender, and reaction to launch noise, or to natural or other human-caused disturbances. PSOs must also record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

(i) USSF must conduct semi-monthly surveys (two surveys per month) to monitor the abundance, distribution, and status of pinnipeds at VSBF. Whenever possible, these surveys will be timed to coincide with the lowest afternoon tides of each month when the greatest numbers of animals are usually hauled out. If a VSBF or area closure precludes monitoring on a given day, USSF must monitor on the next best day.

(1) PSOs must gather the following data at each site: species, number, general behavior, presence and number of pups, age class, gender, and any reactions to natural or human-caused disturbances. PSOs must also record environmental conditions, including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction.

(j) For each rocket or missile launch where monitoring is required as described in paragraphs (a), (c), and (e) of this section, USSF must submit a launch report to NMFS' West Coast Region and Office of Protected Resources within 90 days. This report must contain the following information:

(1) Date(s) and time(s) of the launch (and sonic boom, if applicable);  
 (2) Monitoring program design; and  
 (3) Results of the monitoring program, including, but not necessarily limited to:

(i) Date(s) and location(s) of marine mammal monitoring;

(ii) Number of animals observed, by species, on the haulout prior to commencement of the launch or recovery;

(iii) General behavior and, if possible, age (including presence and number of pups) and sex class of pinnipeds hauled out prior to the launch or recovery;

(iv) Number of animals, by species, age, and sex class, that responded at a level indicative of harassment;

(v) Number of animals, by species, age, and sex class that entered the water, and any behavioral responses by pinnipeds that were likely in response to the specified activities, including in

response to launch noise or a sonic boom;

(vi) Environmental conditions including visibility, air temperature, clouds, wind speed and direction, tides, and swell height and direction; and

(vii) Results of acoustic monitoring, including the recorded sound levels associated with the launch and/or sonic boom (if applicable).

(k) If the activity identified in § 217.60(a) likely resulted in the mortality or injury of any marine mammals or in any take of marine mammals not identified in § 217.62, then the USSF must notify the NMFS Office of Protected Resources and the NMFS West Coast Region stranding coordinator within 48 hours of the discovery of the injured or dead marine mammal.

(i) USSF must submit an annual report each year to NMFS Office of Protected Resources. This report must summarize the data reported in all launch reports for the previous calendar year (as described in paragraph (g) of this section) including a summary of documented numbers of instances of harassment incidental to the specified activities. The annual reports must also include the results of the semi-monthly sentinel marine mammal monitoring and describe any documented takings incidental to the specified activities not included in the launch reports (*e.g.*, takes incidental to aircraft or helicopter operations observed during the semi-monthly surveys).

(l) USSF must submit a final, comprehensive 5-year report to NMFS Office of Protected Resources. This report must:

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

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

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

#### **§ 217.66 Letters of Authorization.**

(a) To incidentally take marine mammals pursuant to this subpart, the USSF must apply for and obtain an LOA in accordance with § 216.106 of this chapter.

(b) An LOA, unless suspended or revoked, may be effective for a period of time not to exceed expiration of this subpart.

(c) If an LOA expires prior to the expiration date of this subpart, the USSF may apply for and obtain a renewal LOA.

(d) In the event of projected changes to the activity or to mitigation,

monitoring, or reporting (excluding changes made pursuant to the adaptive management provision of § 217.67(c)(1) required by an LOA, USSF must apply for and obtain a modification of the LOA as described in § 217.67.

(e) Each LOA 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 LOA 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 LOA shall be published in the **Federal Register** within 30 days of a determination.

#### **§ 217.67 Renewals and modifications of Letter of Authorization.**

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

(1) The specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for this subpart (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 LOA under these regulations were implemented.

(b) For LOA modification or renewal requests by the applicant that include changes to the activity or the mitigation, monitoring, or reporting measures (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 that result in no more than a minor change in the total estimated number of takes (or distribution by species or stock or years), NMFS may publish a notice of proposed changes to the LOA in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the LOA.

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

(1) After consulting with the USSF regarding the practicability of the modifications, NMFS, through adaptive management, may modify (including adding or removing measures) the existing mitigation, monitoring, or reporting measures 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 an LOA include:

(A) Results from the USSF's monitoring from the previous year(s);

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

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

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

(2) 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 LOAs issued pursuant to §§ 216.106 of this chapter and 217.62, an LOA 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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**BILLING CODE 3510–22–P**