

## APPENDIX E MARINE MAMMAL PROTECTION ACT COMPLIANCE

### E.1 INTRODUCTION

The Navy, pursuant to 50 Code of Federal Regulations (C.F.R.) 216, Subpart I (61 Federal Register 15884 et. seq.), § 101 (a) (5) (D) of the Marine Mammal Protection Act (MMPA), 16 United States Code (U.S.C.) § 1371 (a) (5), has requested and received an Incidental Harassment Authorization (IHA) allowing non-lethal takes of marine mammals incidental to their missile and target launch operations on San Nicolas Island, California. Section 101 (a) (5) (D) of the MMPA directs the Secretary of Commerce to allow, upon request, the incidental, but not intentional, “taking” of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and authorization is issued. An IHA may be granted if the National Marine Fisheries Service (NMFS) finds that the non-intentional, non-injurious “take by harassment” of small numbers of marine mammals will have a negligible impact on the species or stocks; will not have an unmitigable adverse impact on the availability of the species or stocks for subsistence uses; and the permissible methods of “taking” and requirements pertaining to the monitoring and reporting of such taking are set forth.

The Navy submitted an IHA Application and associated Marine Mammal Monitoring Plan to NMFS on 5 February 2001. The application included a description of the launch activities, proposed mitigation measures to reduce or eliminate potential injurious effects on marine mammals, and a plan to monitor any effects of launch activities on these marine mammals. On 1 August 2001, the Navy was issued an IHA from NMFS, allowing the “take by harassment” of small numbers of northern elephant seals, harbor seals, California sea lions, and northern fur seals during routine launch operations on Navy-owned San Nicolas Island.

As discussed in Section 3.0.2.1 of this EIS/OEIS, missiles and targets are launched routinely from San Nicolas Island during Navy test and training operations at the Point Mugu Sea Range. As described in Section 4.7 of the EIS/OEIS, the potential exists for pinnipeds that haul out on San Nicolas Island to be startled by noise from a missile or target launch from the island. For the purposes of the IHA Application, pinnipeds are assumed to be “taken by harassment” if, as a result of a launch, pinnipeds move off the beach either in a stampede or a less hasty manner (consistent with NMFS [1999], momentary alert or startle reactions with no large-scale movement are not considered “taking”). Recent monitoring efforts at the island revealed that pinnipeds stampeded during two separate Vandal launch events. The Navy therefore requested an IHA for incidental take by harassment during planned Vandal and other missile launches on San Nicolas Island during a one-year period commencing in 2001. The Naval Air Warfare Center Weapons Division (NAWCWD) Point Mugu plans to launch approximately 15 Vandals and five smaller targets from San Nicolas Island during the one-year period. The purpose of the issuance of an IHA is to ensure compliance with the relevant provisions of the MMPA and associated regulations, including requirements for mitigation measures. The IHA allows the Navy maximum operational flexibility and ensures that launch operations at San Nicolas Island are conducted in full compliance with the provisions of the MMPA. The IHA enables NAWCWD Point Mugu to continue launch operations in support of test and training activities in the Point Mugu Sea Range, and fosters a proactive approach to addressing issues related to potential marine mammal impacts. Establishment of a marine mammal monitoring plan provides additional information on the extent of potential impacts from various launch vehicles and will help to develop future management efforts. The estimated numbers of animals to be potentially “taken by harassment” and a description of the mitigation measures and monitoring plan are summarized in this appendix.



## E.2 NUMBERS OF MARINE MAMMALS THAT MAY BE “TAKEN”

A description of the species and number of pinnipeds known to occur on San Nicolas Island is provided in Section 3.7.4.3 of this EIS/OEIS. Many additional details, literature citations, maps, and graphs of numerical trends are given in the *Marine Mammal Technical Report*, incorporated by reference in this EIS/OEIS. In summary, San Nicolas Island and adjacent waters are important for northern elephant seals, California sea lions, and harbor seals, which haul out, molt, and breed on various parts of San Nicolas Island. In addition, a few northern fur seals have been observed to haul out at the island during the past decade (Stewart and Yochem 2000). The Guadalupe fur seal may have bred on the island historically, although the last reported sighting on San Nicolas Island involved a lone male seen there in 1986 (Stewart et al. 1987). Steller sea lions have been sighted on the island in the past (Bartholomew 1951), but apparently did not breed there (Stewart and Yochem 1984). They are not likely to occur there now given their general abandonment of southern California waters. The numbers of all of these pinniped species aside from the Steller sea lion appear to be increasing in central California as well (Sydeman and Allen 1999; NMFS 2000).

For the purposes of the IHA Application, pinnipeds were assumed to be “taken by harassment” if, as a result of a launch, behavioral patterns of pinnipeds are disrupted, or Temporary Threshold Shift (TTS) occurs. However, as described in Section 4.7.2 of the EIS/OEIS, no effects on hearing sensitivity (TTS) are expected to occur as a result of the planned launches of target missiles. Therefore, the estimated “disturbance criterion” of 100 dB re 20  $\mu$ Pa SEL (as described in Section 4.7.1.1 of the EIS/OEIS) was used to help estimate the number of pinnipeds that could potentially be “taken by harassment” from a missile or target launch from San Nicolas Island. It is important to note that the estimated disturbance criterion (100 dB re 20  $\mu$ Pa SEL) is based on limited data. The provisional criterion should be tested with quantitative field observations coupled with accurate sound measurements. This is desirable in order to establish more firmly the relationship between behavioral responses and the acoustic stimuli that elicit them. The monitoring work described in the IHA Application and summarized in this appendix will seek to verify or refine the provisional disturbance criterion used here as it applies to exposure of the three species of pinnipeds on San Nicolas Island to launches of Vandal targets and of smaller subsonic targets.

### E.2.1 Estimating “Takes” by Harassment

As shown in Figure 4.7-3 of this EIS/OEIS, Vandal target launches from San Nicolas Island produce a 100 dB-A SEL acoustic contour estimated to extend a large distance from its launch track, with maximum sound levels on Bachelor Beach measured at 131 dB SEL (Greene 1999). The 100 dB sound contours for other targets, such as the smaller BQM-74, are unknown. The recorded launch sounds from a BQM-34 launch at Point Mugu on 18 November 1997 (Burgess and Greene 1998) were 142.2 dB SEL at only 50 feet (15 m) from the launch site, decreasing to 102.2 dB at 1,200 feet (370 m). This value is about 20 dB lower than that of a Vandal at a similar distance (Greene 1999), so the 100 dB contour for the BQM-34 and smaller BQMs would be much reduced relative to that for the Vandal. The Navy assumes for the purposes of take estimation that the 100 dBA contour for a BQM-34 is equal to 4,500 feet (1,372 m); this is the maximum distance at which sound levels fall to 100 dBA at a 90 degree azimuth from the launch track (C. Malme, Engineering and Scientific Services, Hingham, MA, unpublished data). Along the launch track and ahead of the BQM-34, sound levels drop to 100 dBA at a shorter distance (1,800 feet, 549 m). For the smaller BQM-74 and Exocet missiles it is likely that the 100 dBA sound contours will be smaller still. In all cases, the 100 dB contour for these other vehicles would likely be smaller than that of the Vandal contour illustrated on Figure 4.7-3.

Harbor seals, California sea lions, and northern elephant seals that haul out on the western end of San Nicolas Island may be within the perimeter of the 100 dB contour applicable to Vandal launches. Far fewer seals would be within the perimeter of the 100 dBA contour applicable to BQM-34 and BQM-74

launches. The number of hauled-out pinnipeds within the 100 dB contour was estimated using census data obtained during aerial and ground-based surveys of San Nicolas Island by NMFS staff. These data are contained in Lowry n.d. (approx. 1995), and provide the most recent counts of northern elephant seals and California sea lions. Map areas G through N in the Lowry report (see Figure E-1; also provided as Figure 3.7-83 in the *Marine Mammal Technical Report*) correspond well to the 100 dB sound level contour (Figure 4.7-3 of this EIS/OEIS). An upward adjustment was applied to the harbor seal estimates given by Lowry due to the recent occupation of new sites at the west end of the island by harbor seals (see Harbor Seal subsection, below).

To estimate the potential numbers of pinnipeds (by species) that might be hauled out within the 100 dB sound level contour, the average total number of adults, subadults, and pups recorded within map areas G to N during all years for which there was survey data (usually 1989 to 1993, although unpublished data from NMFS for 1999 and 2000 for California sea lions and elephant seals, respectively, were also obtained) was calculated. For each species, some of the censuses were done at a time of year when maximum numbers are known to occur on land. All three species are seasonal breeders: northern elephant seals are most abundant on land during their winter breeding period; California sea lions and harbor seals are most abundant on land during their spring and summer breeding periods, respectively. In addition, other life history traits such as feeding patterns reduce the proportion of time that individual animals might be hauled out on San Nicolas Island; these are discussed in the subsections for the individual species, below.

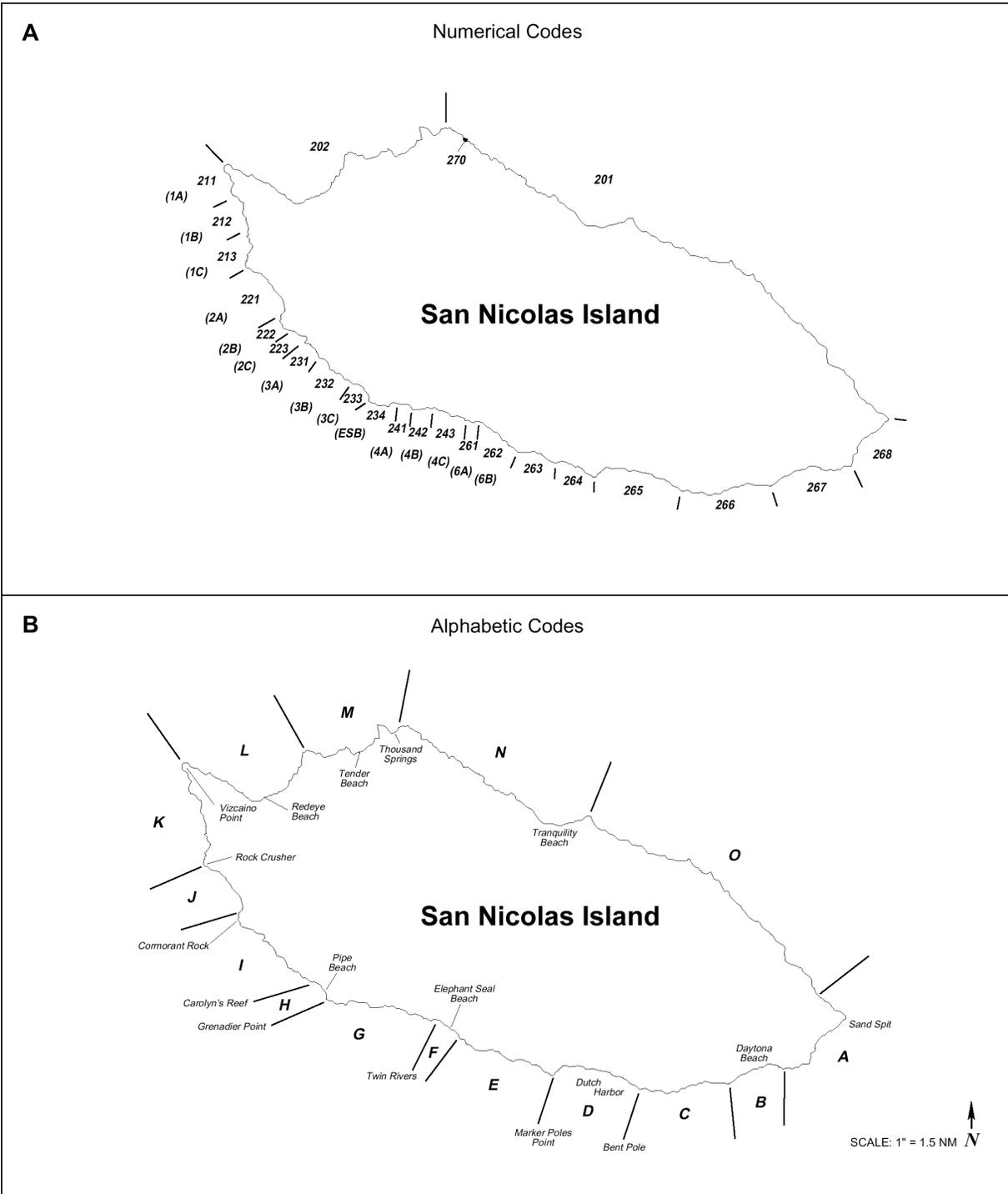
#### E.2.1.1 Northern Elephant Seal

All sex and age classes (including pregnant females) could be found on the beaches at certain times of year. However, adult northern elephant seals are at sea for 8 to 10 months per year, and juveniles are offshore for an even greater proportion of the time.

To estimate the potential numbers of northern elephant seals that might be hauled out within the 100 dB sound level contour, an average population based on the counts of adults, subadults, and pups within map areas G to N during all years with survey data (usually 1989 to 1993) was calculated. Northern elephant seals are most abundant on land during their winter breeding period (late January to early February). Assuming the 15.4% growth rate has continued since 1995, and correcting for the fact that a small proportion of the total population would be ashore during most of the year, the average number within the 100 dB contour at this time of year during 2000 might be 9,560. Although there were more elephant seals on San Nicolas Island in 1994 than previous years (Lowry, unpublished data), the average number within the 100 dB contour remained relatively consistent. Based on what is known about the proportion of the year that various age and sex classes spend ashore (see previous paragraph), it is likely that elephant seals might be ashore only 17 to 34% of the year.

In the absence of any contrary data, it was assumed that elephant seals exhibit high site fidelity when they do return to shore, and that the 9,560 seals mentioned above represent the total number that might be exposed to “strong” ( $\geq 100$  dB) sounds during the year. If some seals haul out on different beaches at various times during the year, sometimes within and sometimes outside the 100 dB contour, then the number of times an individual elephant seal might be exposed to strong launch sounds would be reduced. However, the total number of individuals that would be exposed at least once over the course of the year would probably be increased. Movements from one beach to another may be more likely for juveniles than for older seals, given that this has been observed in other pinniped species (such as for harbor seal pups; Thompson et al. 1994).





**Figure E-1.** San Nicolas Island showing census areas and associated (A) numerical codes (Stewart and Yochem 1984) and (B) alphabetic codes (Lowry n.d.) used to identify census areas.

Published studies indicate that elephant seals are more tolerant of transient noise and other forms of disturbance than are California sea lions or harbor seals. Hence, the 100 dB SEL criterion used here for all species of pinnipeds is probably too low (conservative) for this species. If so, the actual impact zone is smaller than assumed here, and the number elephant seals that might be “taken by harassment” will be

substantially lower than the number of seals present within the 100 dB contour. It is doubtful that many (if any) northern elephant seals exhibit more than brief startle reactions in response to these launches. Consistent with NMFS (1999), minor alert or startle responses without any substantive movement by the seals are not considered to be “taking.” It is likely that only the pubertal or juvenile animals hauled out at the water’s edge might react strongly. These age classes represent a small part (probably less than 25%) of the northern elephant seals that haul out on western San Nicolas Island. Thus, of the estimated 9,560 elephant seals occurring within the 100 dB contour at certain times of year, on the order of 2,390 individuals might react more strongly than other elephant seals.

In summary, the Navy estimates that it is most likely that less than 2,390 elephant seals (mainly juvenile or pubertal males) might be “taken by harassment” during the planned year of launch operations. The effects of this harassment on individuals and the population are expected to be negligible. The Navy’s monitoring plan (summarized later in this appendix) will determine whether northern elephant seals do in fact react in ways that would be considered harassment, and (if so) the approximate numbers involved.

#### E.2.1.2 Harbor Seal

All sex and age classes (including pregnant females) could be found on the beaches throughout the year, although in reduced numbers at certain times due to foraging patterns and adverse weather.

To estimate the potential numbers of harbor seals that might be hauled out within the 100 dB sound level contour, an average population based on the counts of adults, subadults, and pups recorded within the map areas G to N during all years with survey data (usually 1989 to 1993) was calculated, and it was further assumed that the population has remained relatively stable until 2000. Harbor seals are seasonal breeders and thus are slightly more abundant during their late winter and spring breeding and molting periods. As noted in Section 4.7.2.1 of the EIS/OEIS, it was estimated that 60% of the harbor seals on San Nicolas Island occur within the 100 dB contour; this value was incremented to 70% to account for the newly-occupied haul-out areas on the island’s west end (G. Smith, NAWS China Lake/San Nicolas Island EPO, pers. comm.). In a single aerial survey, 457 harbor seals were recorded along the coast of the island. This count may be an underestimate as it is based on a single survey, with no consideration of the natural variability in the number of these seals observed at other haul-out sites. Assuming this survey estimate is correct, the number of harbor seals that might be hauled out within the 100 dB contour is 320. During the night this number would be greatly reduced as harbor seals usually go to sea to forage between 1900 and 1100. Thus, the proportion of harbor seals ashore over the course of a 24-hour period might be less than one third of the peak numbers. During August to February it has been reported that the numbers hauled out might be only 65 to 83% of the maximum numbers ashore during the breeding season. During winter the proportion hauled out relative to the peak season might be only 15%. If it is assumed that for all months except the breeding season, each seal might haul out for only 8 hours between foraging bouts, then a harbor seal would probably be present for only a few of the ~20 launches per year. Many of these harbor seals are at sites well off the launch trackline (e.g., rather than the western side of the island) where the received sound levels will be not much above 100 dB SEL. It is therefore not at all certain that they will react.

The Navy estimates that far less than 457 of the harbor seals on San Nicolas Island might be taken by harassment during launch operations. The Navy’s monitoring plan will provide information crucial to determining whether harbor seals do react in any significant way to these launches. Any take would be limited to harassment, and the effects on individuals and the population would be negligible.



### E.2.1.3 California Sea Lion

Adult female California sea lions could be found on the beaches throughout the year, although in reduced numbers at certain times due to foraging patterns and adverse weather. Males come ashore only briefly during the spring breeding period.

To estimate the potential numbers of harbor seals that might be hauled out within the 100 dB sound level contour, the number of sea lions occurring within map areas G to N at some point during the year based on counts in years for which there was survey data (usually 1989 to 1993) was calculated. After correcting for population growth (NMFS 2000), in 2000 the Navy estimates that 116,398 to 122,104 sea lions of all ages and sexes were associated with the haul-out sites and rookeries on San Nicolas Island over the course of the year. Approximately 82.6% of these (96,144 to 100,858) would haul out within the estimated 100 dB contour at various times during the year. For most of the year, only females and pups (and then perhaps less than half of these) are expected to be ashore, so the number exposed to any one launch will be significantly less than these estimated total numbers within the 100 dB contour. Further, based on observations from video recordings of sea lions near the trackline during several Vandal launches, only a portion of the seals ashore may have fled into the water; many startled or moved only a short distance on the beach. As these video records were made for haul-out groups near the trackline, then it is likely most of those in the 100 dB contour would be farther away than those in the videos, and thus the overall proportion reacting to launch sounds will be lower than suggested by the video records. Finally, most of these California sea lions are at sites well off the launch trackline (e.g., on the southern side of the island) where the received sound levels will be not much above 100 dB SEL. As is the case for the harbor seals, it is therefore not at all certain that these animals near the margin of the 100 dB contour will react. Until a monitoring program quantifies the reactions of sea lions to target launches, the Navy assumes that perhaps 10% (9,614 to 10,086) of the California sea lions exposed to launch sounds during the year might exhibit disturbance of behavioral patterns.

The Navy estimates that between 9,614 to 10,086 of the California sea lions on San Nicolas Island might be taken by harassment during launch operations. The Navy's monitoring plan will provide information crucial to determining how many California sea lions do react in any significant way to these launches. Any take would be limited to harassment, and the effects on individuals and the population would be negligible, especially given the rapid increase in the population and the lack of any evidence of increased pup mortality.

### E.2.1.4 Northern Fur Seal

There have been a few sightings of northern fur seals on San Nicolas Island in the past decade. The Navy estimates that no more than three northern fur seals would be present within the 100 dB contour during one or more launches within the period of applicability of the IHA. It is unknown whether this maximum estimate of three individuals would show a strong disturbance reaction (i.e. be "taken"). It is more probable that no northern fur seals will haul out within the 100 dB zone, and therefore it is more probable that none will be taken by harassment. Any take is estimated to involve no more than three individuals, and would be limited to harassment; the effects on individual northern fur seals and the population would be negligible.

### E.2.1.5 Summary

Pinniped reactions as a result of exposure to launches of targets from San Nicolas Island are expected to involve occasional stampedes or other abrupt movements by some individuals on the beaches around the western end of the island. As described in Section 4.7.2.1 of this EIS/OEIS, these disturbance reactions are not expected to result in long-term negative consequences for the individuals or their populations.

The numbers of individuals that might stampede or otherwise shift position on the beaches are difficult to estimate until additional monitoring work is done. Provisional estimates indicate that no more than 2,390 northern elephant seals, 457 harbor seals, 9,614 to 10,086 California sea lions, and 3 northern fur seals are likely to be “taken” in this manner during all the launches within the period of applicability of the IHA. However, these estimates may be substantial overestimates of the actual numbers of pinnipeds that will show strong reactions (especially those for northern elephant seals and California sea lions). The monitoring program described in the IHA Application and summarized below will, for the three common species, provide data on the actual numbers of “takes,” and on the specific nature of the “taking.”

### **E.3 MITIGATION MEASURES**

The number of individual animals expected to be disturbed during launch activities will be small in relation to regional population sizes. With the monitoring and mitigation provisions (summarized below), effects on those individuals are expected to be well-documented, and limited to harassment. This is expected to have negligible impacts on the species and stocks.

To avoid additional harassment to the seals on beach haul-out sites, and to avoid any possible sensitizing and/or predisposing seals to greater responsiveness to the sights and sounds of a launch, the Navy will limit activities near the beaches in advance of launches. Existing safety rules for Vandal launches provide a built-in mitigation measure of this type: personnel are not normally allowed near any of the pinniped beaches close to the flight track on the western end of San Nicolas Island prior to launch. In addition, due to the presence of colonies of sensitive seabirds (as well as pinniped haul-out sites) on western San Nicolas Island, there are already special restrictions on personnel movements near some pinniped beaches (refer to Table 3.0-7 of the EIS/OEIS).

To minimize the likelihood that impacts will occur to the species and stocks, the target missile launch operations will be conducted in accordance with all federal regulations. Where practicable, the Navy will adopt the following additional mitigation measures when doing so will not compromise operational safety requirements or mission goals:

- (1) The Navy will limit launch activities during pinniped pupping seasons, particularly of harbor seals,
- (2) The Navy will not launch target missiles at low elevation on launch azimuths that pass close to beach haul-out site(s),
- (3) The Navy will avoid multiple target launches in quick succession over haul-out sites, especially when young pups are present, and
- (4) The Navy will limit launch activities during the night.

### **E.4 MONITORING PLAN**

The Navy expects that the planned launches will cause disturbance reactions by some of the pinnipeds on the beaches, but no pinniped mortality and no significant long-term effect on the stocks of pinnipeds hauled out on San Nicolas Island. The Navy will monitor the haul-out areas before, during, and after launch operations to document and characterize any observed responses, and (to the extent feasible) to detect any instances of pinniped injuries or deaths should they occur. The monitoring will be designed to determine how common the disturbance reactions are, the area over which they occur, and their relationship to launch sounds.

The monitoring tasks are described in detail in the IHA Application and summarized below:



- (1) The Navy, in conjunction with a biological contractor, will establish a land-based monitoring program to assess launch noise effects on the three common pinniped species on San Nicolas Island. This monitoring will occur at three sites at different distances from the launch site before, during, and after each launch. The monitoring will be via autonomous digital video cameras or, when possible, through direct observation. Through one of these methods, pinniped behavior on the beach will be documented prior to the planned launch operations, during the launch, and following the launch. Digital video cameras will be used to make high-quality records for later playback analysis.
- (2) During each launch, the Navy in conjunction with an acoustical contractor will obtain calibrated recordings of the sounds of the target launches as received at different distances from the target's flightline. It is anticipated that acoustic data will be acquired at three locations during each launch, with a variety of different recording sites being used over the course of the year. These recordings will provide for a thorough description of launch sounds as received at different locations on western San Nicolas Island, and of the factors that affect received sound levels. Insofar as possible, the acoustic data will be obtained at the same sites as the video data on pinniped responses to the launches (task 1). By analysis of the paired data on behavioral observations and received sound levels, it will be determined whether there is a clear relationship between the two. If so, the "dose-response" relationship will be determined.

The launch monitoring work constitutes the first year in which formal, concurrent pinniped and acoustical monitoring programs will be conducted during target missile launch activities by NAWCWD Point Mugu. Several of the questions about effects of such launch activities on seals ashore should be answered by the time the first year of monitoring is completed. The Navy suggests that, following submission of the draft technical report 120 days before the end of "year 1", it will be appropriate for the Navy and NMFS to discuss the scope for any additional launch monitoring work on SNI subsequent to "year 1". In particular, some biological or acoustic parameters may be documented adequately during "year 1", and it may not be necessary to continue all aspects of the monitoring work after "year 1".

## E.5 REFERENCES CITED

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