

other vehicles used would be similar in size and weight or slightly smaller and would have characteristics generally similar to the Vandal. However, NAWS also has requested a marine mammal take authorization for up to 3 launches annually for vehicles that may be larger than the Vandal, but would be under 50,000 lbs (23,000 kilograms (kg)) in weight.

Vandal Target Missiles

The Vandal (designated MQM-8G) target missile is a relatively large, air-breathing (ramjet) vehicle with no explosive warhead that is designed to provide a realistic simulation of the mid-course and terminal phase of a supersonic anti-ship cruise missile. These missiles are 7.7 m (25.2 ft) in length with a mass at launch of 3,674 kg (8,100 lbs) including the solid propellant booster. There are variants of the Vandal; they all have the same dimensions, but differ in their operational range. The Vandals are remotely controlled, non-recoverable missiles. At launch, the Vandal is accelerated for several seconds by a solid propellant rocket booster to a speed sufficient for the ram-jet engine to start. After several seconds of thrust, the booster is discarded, falls into the water of the Sea Range, and the Vandal continues along its flight path at supersonic speed under ramjet power.

The Vandal and most other targets are launched from the ALC on the west-central part of SNI, a land-based launch site. The ALC is 192 m (630 ft) above sea level and is approximately 2 kilometers (km) (1.25 miles (mi)) from the nearest pinniped haul-out site. Launch trajectories from ALC may vary from a near-vertical liftoff, crossing the west end of SNI at an altitude of approximately 3,962 m (13,000 ft) to a nearly horizontal liftoff, crossing the west end of SNI at an altitude of approximately 305 m (1,000 ft). However, to date, most Vandal launches during NAWS first IHA monitoring program had low angles (8 degrees) crossing the SNI beaches at an altitude of about 1,300 ft (396 m) (Lawson, 2002). Four Vandals however, had high angle (42 degrees) profiles, crossing SNI beaches at an altitude of about 9,600 ft (2,926 ft) (Lawson, 2002).

Vandal launches produce strong noise levels. Sound measurements collected during two Vandal launches in 1997 and 1999 indicated received A-weighted SPLs ranged from 123 dB (re 20 micro-Pa) (SEL of 126 dB re 20 micro-Pa²-sec) at 945 m (3,100 ft) to 136 dB (re 20 μ Pa) (SEL of 131 dB re 20 micro-Pa²-sec) at 370 m (1,215 ft) (Burgess and Greene, 1998; Greene, 1999). The most intense

sound exposure occurred during the first 0.4 to 4.1 seconds after launch (Greene, 1999; Greene and Malme, 2002). However, what is important for this action is not the noise level near the launch site but the noise level over the pinniped haulouts on the SNI beaches. This will be discussed later in this document.

Supersonic and Subsonic Targets and Other Missiles

The Navy also plans to launch other subsonic and supersonic vehicles to simulate various types of threat missiles and aircraft. These are small unmanned aircraft that are launched using jet-assisted take-off (JATO) rocket bottles. Once launched, they continue offshore where they are used in training exercises to simulate various types of subsonic threat missiles and aircraft. The larger target, BQM-34, is 7 m (23 ft) long and has a mass of approximately 1,134 kg (2,500 lb) plus the JATO bottle. The smaller BQM-74, is 420 centimeters (cm) (165.5 inches (in)) long and has a mass of approximately 250 kg (550 lbs) plus the JATO bottle. Additional types of small vehicles that may be launched include the Exocet and Tomahawk missiles, and the Rolling Airframe Missile (RAM).

All of these smaller targets are launched from either the ALC or from Building 807. Building 807 is approximately 10 m (30 ft) above sea level and accommodates several fixed and mobile launchers that range from 30 m (98 ft) to 150 m (492 ft) from the nearest shoreline. For these smaller vehicles, launch trajectories from Building 807 may range from 6 to 45 degrees and cross over the nearest beach at altitudes from 15 to 190 m (50 to 625 ft).

Sound measurements were collected from the launch of a BQM-34S at the Point Mugu Naval Air Station (NAS) in 1997. Burgess and Greene (1998) found that for this launch, the A-weighted SPL ranged from 92 dB (re 20 micro-Pa) (SEL of 102.2 dB re 20 micro-Pa²-sec) at 370 m (1,200 ft) to 145 dB (re 20 micro-Pa) (SEL of 142.2 dB re 20 micro-Pa²-sec) at 15 m (50 ft). These estimates are approximately 20 dB lower than that of a Vandal launch at similar distances (Greene, 1999). The measured Terrior Orion SPL ranged from 89 to 138 dB and the SEL from 93 to 138 dB, although the SPL/SEL of 138 dB appears to be anomalously high (Lawson, 2002). The SPL/SELs for the AGS launches ranged from 95 to 150 dB (93 to 137 dB SEL) and the RAM launch SPL was 126 dB (131 dB SEL). It should be noted that these measurements were all flat-weighted, meaning that A-weighted

SPL/SELs values were several decibels lower.

General Launch Operations

Aircraft and helicopter flights between NAS on the mainland, the airfield on SNI and the target sites in the Sea Range will be a routine part of any planned launch operation. These operational flights do not pass at low level over the beaches where pinnipeds are expected to be hauled out. In addition, movements of personnel are restricted near the launch sites 2 hours prior to a launch, no personnel are allowed on the western end of SNI during Vandal and other vehicle launches, and various environmental protection restrictions exist near the island's beaches during other times of the year.

Description of Habitat and Marine Mammals Affected by the Activity

A detailed description of the Channel Islands/southern California Bight ecosystem and its associated marine mammals can be found in several documents (Le Boeuf and Brownell, 1980; Bonnell et al., 1981; Lawson et al., 1980; Stewart, 1985; Stewart and Yochem, 2000; Sydeman and Allen, 1999) and is not repeated here.

Many of the beaches in the Channel Islands provide resting, molting or breeding places for species of pinnipeds including: northern elephant seals (*Mirounga angustirostris*), harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), northern fur seals (*Callorhinus ursinus*), and Steller sea lions (*Eumetopias jubatus*). On SNI, three of these species, northern elephant seals, harbor seals, and California sea lions, can be expected to occur on land in the area of the proposed activity either regularly or in large numbers during certain times of the year. Descriptions of the biology and distribution of these three species and others in the region can be found in NAWS (2002), Stewart and Yochem (2000, 1994), Sydeman and Allen (1999), Lowry et al. (1996), Schwartz (1994), Lowry (1999) and several other documents (Barlow et al., 1997; NMFS, 2000; NMFS, 1992; Koski et al., 1998; Gallo-Reynoso, 1994; Stewart et al., 1987). General information on harbor seals and other marine mammal species found in Central California waters can be found in Caretta et al. (2001, 2002), which are available at the following URL: http://www.nmfs.noaa.gov/prot_res/PR2/Stock_Assessment_Program/sars.html. Please refer to those documents and the application for further information on these species.