

ASSESSMENT OF  
DEEP DIVING WHALES  
MAJOR RANGE DISTRIBUTION  
WITHIN THE  
MONTEREY BAY  
NATIONAL MARINE SANCTUARY

APRIL 4, 2001



Currently the U.S. Navy is consulting with the Director of the Office of National Marine Sanctuaries in order to deploy Surveillance Towed Array Sensor System Low Frequency Active Sonar (SURTASS LFA) within the Monterey Bay National Marine Sanctuary. The sonar system is a long-range, low frequency sonar that has both active and passive components. The purpose of the proposed action is to meet U.S. need for improved capability to detect foreign submarines at long range. The characteristics and operating features of the active component (LFA) are:

- The source is a vertical line array of up to 18 source emitters suspended below the vessel.
- LFA's transmitted beam is omnidirectional (360 degrees along a horizontal plane (nominal depth of the center of the array is 122m [400 ft]), with a narrow vertical beamwidth that can be steered above or below the horizontal axis.
- The source frequency is between 100 and 500 Hz. A variety of signal types can be used including continuous wave (CW) and frequency-modulated signals.

It is possible that this deployment of acoustics will adversely affect Sanctuary resources. Operation of the SURTASS LFA system may constitute a violation of federal regulations at 15 CFR (922.132 (5)) which prohibit taking any marine mammal, sea turtle or seabird in or above the Sanctuary, except as permitted by regulations, under the Marine Mammal Protection Act, the Endangered Species Act, and the Migratory Bird Treaty Act. NOAA Fisheries (NMFS) will determine whether to grant the Department of Defense a small take exemption under the Marine Mammal Protection Act.

The FEIS for SURTASS LFA Appendix A states: "Sanctuary regulations require that military activities be carried out in a manner that avoids to the maximum extent practicable adverse impacts on Sanctuary resources and qualities. The Navy has determined that Alternative 1 of the Draft OEIS/EIS would meet this requirement".

Sanctuary regulations at 15 CFR 922.132 (c) except some Department of Defense activities from the above prohibitions, but only military activities *specifically identified* in the MBNMS Final Environmental Impact Statement/ Management Plan (FEIS/MP) published in June 1992. Sanctuary regulations are very clear in stating that the prohibitions in paragraphs (a) (2) through (9) do not apply to *existing* military activities carried out by the Department of Defense. SURTASS LFA was not identified as a pre-existing activity in the 1992 FEIS/MP, and would therefore not be eligible for exception from these prohibitions. However, new activities may be exempted after consultation between the Director and the Department of Defense.

We understand the intent of the Navy's proposal is to keep the sound source outside the limits of the United States Territorial Sea. This should reduce potential impacts to the migrating Gray whales during the winter and spring.



However, the Monterey Bay National Marine Sanctuary has concerns regarding the variety and distributions of deep diving whales throughout our boundaries, in particular, offshore areas beyond the Territorial Sea during spring, summer, and fall.

### Deep Diving Whales Range Distribution Charts

The Sanctuary has compiled charts of the range and distribution of some of the deep-diving whale species present within our region. All of these species are either threatened or endangered, and all are sought by a growing number of whale watching boats in central California. These data are summarized below.

Chart 1 – Deep Diving Whales Major Range Distribution. The Blue Whale major adult area is illustrated by green diagonals and is within Sanctuary boundaries from May through December. The Right Whale adult area is depicted by the light orange dots and ranges throughout Sanctuary boundaries from October through March. The Humpback Whale major adult area is illustrated by purple diagonals and is within Sanctuary boundaries from May through October. The Fin Whale major adult area is depicted by blue dots and is within Sanctuary boundaries from April through September. The Sperm Whale major adult area is illustrated by orange verticals and is over Davidson Seamount on a year-round basis.

Chart 2 – Blue Whale Range Distribution. Blue Whales are the largest animal to live on earth and in the past decade its numbers have surged locally. The Monterey Bay National Marine Sanctuary hosts several hundred blue whales annually who come to the region to feed on krill. These animals are highly mobile and it is thought that they move regularly between the Monterey Bay region and other feeding grounds near Cordell Bank and the Channel Islands. Blue Whales within the MBNMS range throughout the Sanctuary boundaries from May to December as depicted by the blue dots. The area in green illustrates the major adult area from May to September.

Chart 3 – Northern Pacific Right Whale Range Distribution. Marine Scientists consider the Northern Pacific Right Whale the most rare mammal in the world. It represents a separate subspecies from the Atlantic Right Whale, which we understand the Navy has elected to avoid on the eastern U.S. seaboard. The three most recent sightings of the Northern Pacific Right Whale south of Alaska have occurred in the Monterey Bay National Marine Sanctuary, two of which occurred in the last four years. The entire region is considered to be within the Right Whales' range. Any disturbance to this extremely rare whale could be disastrous. Right Whales within the MBNMS range throughout the Sanctuary boundaries from October through March as depicted by the orange dots.

Chart 4 – Humpback Whale Range Distribution. Humpback whales are highly acoustic animals known for their "songs". Their songs are long and complex intertwining melodies, which can sometimes last up to twenty minutes long. These songs are repeated continuously for hours. The Humpbacks in the North American Pacific populations all sing the same song which progressively



changes over the years. The bulk of evidence thus far, points to the singing whales being males; it is thought that these songs are a function of mating behavior. Any device that has the potential to effect, impede, or alter this behavior should be examined critically. Humpback whales within the MBNMS range throughout the Sanctuary boundaries from May through October. The area depicted in red diagonals is the major adult concentration for feeding and migration from May through October, as well as the recreational viewing area from June through September. The area in blue dots depicts the major adult area for feeding and migration from May through October.

Chart 5 – Fin Whale Range Distribution. Once one of the most abundant of the large whales, the Fin whale was heavily exploited by the whaling industry and its population has been severely depleted. Current figures suggest that a mere 80,000 animals remain worldwide with between fifty and several hundred in the MBNMS. Fin whales within the MBNMS range throughout the Sanctuary boundaries from April through September and commonly feed on krill associated with upwelling at the boundaries of offshore currents. The area depicted by small blue dots illustrates the major adult area whereas the area depicted by the larger blue dots illustrates the general adult area.

Chart 6 – Sperm Whale Range Distribution. The Sperm whale is the deepest diving whale and can swim to depths of 1000 m, and stay submerged for over an hour. At depth there is very little light available and hence these whales have developed a superior echolocation ability, which they use to find their prey. As such, these animals are highly dependent upon sound. It is unlikely that an observer on a ship would be able to accurately interpret this animal's reaction to LFA, or to even see a Sperm whale feeding in the Sanctuary. Sperm whales within the MBNMS range throughout the Sanctuary boundaries on a year round basis. The adult area within Sanctuary boundaries is illustrated by blue dots. The major adult area that should be noted, though it is outside of Sanctuary boundaries, is the area around Davidson Seamount as depicted by the orange lines.

### Beaked Whales

The Monterey Bay National Marine Sanctuary has three species of beaked whales that inhabit our waters – the Baird's, Cuvier's and Hubbs beaked whale. Little is known about these cetaceans. They may be rare or merely elusive, but generally they live in deep offshore waters and have escaped live studies.

Studies of dead beaked whales from the March 2000 Bahamas strandings by Kenneth Balcomb, indicate that a resonance phenomena in the whales cranial airspaces may be responsible for tearing apart the delicate tissue around the ears and brain. Kenneth Balcomb further reiterated that the resonance frequency of airspaces in Cuvier's beaked whales to be about 290 Hz at 500 meters depth, which is precisely the middle frequency of LFA as described in the OEIS/EIS.



### Marine Mammal Abundance Information

Table 1 was generated from data compiled by the National Marine Fisheries Service and reports the estimated Pacific populations as well as the estimated California populations for the following species of whales: Blue, Humpback, Fin, Minke, Gray, Northern Right, Sperm, Cuvier's Beaked, Baird's Beaked, and Mesoplodont Beaked. Migrating species are indicated seasonally on the right of the table.

Table 2 is taken from the Final EIS/EIR for the California ATOC project and estimates the marine mammal stock of the following species of whale: Blue Humpback, Fin, Minke, Gray, Sei, Northern Right, Sperm and Beaked for the offshore central California area. This table separates Winter/Spring populations from Summer/Fall populations.

### Sea Turtle Abundance Information

Table 3 is taken from the Final EIS/EIR for the California ATOC project and estimates the following sea turtle species: Leatherback, Green, Olive and Loggerhead. The abundance of these species is unknown.

### Acoustic impacts

The University of California at Santa Cruz, Marine Mammal and Seabird Ecology Group has produced a technical report for LFA EIS entitled Marine Vertebrates and Low Frequency Sound that states:

*Richardson et al. (1991) found that belugas have an auditory threshold of 40 dB. This suggests, by analogy, that belugas experience discomfort at sounds of 140-160 dB (Gordon and Moscrop 1996). If cetaceans such as baleen whales have similarly low auditory thresholds for LFS, then sound levels of 195-210 dB could result in immediate damage and permanent threshold shift (PTS).*

*Because all species of mysticete whale recorded to date produce loud, species-specific signals in the low-frequency band, they are particularly at risk from manmade LFS. It is unclear whether low-frequency signals produced by most mysticetes are used for communication, orientation, navigation, or detection of predators and prey. However, disruption of any of these functions could interfere with normal activities and behavior, and potentially impact the reproductive success of individuals and eventually the size of a population.*

Furthermore, Whale Biologist Kenneth C. Balcomb, has stated in a letter sent to Mr. J.S. Johnson, SURTASS LFA Sonar OEIS/EIS Program Manager, dated February 23, 2001 that:

*Based on two significant mass mortality events (Greece and the Bahamas) the body of evidence indicates that not only is resonance with LFA and sonar frequencies a problem*



*for beaked whales, the sound pressure level of 180 db RL is demonstrably not safe for beaked whales and is probably not safe for other cetaceans.*

### NEPA issues

The following is a list of public hearings held by the Department of Defense regarding LFA: Norfolk, Virginia 1999, San Diego, California 1999, and Honolulu, Hawaii 1999. The National Environmental Policy Act requires agencies to provide public notice to people and agencies who may be interested or affected (40 CFR 1506.6[b]) and to those who have requested it (40 CFR 1506.09(b)(1)). The residents of the communities adjacent to the Sanctuary boundaries were not adequately informed of this proposed project.

Furthermore, it is the position of the MBNMS that the latest research mentioned above presents a seriously different picture of the likely environmental consequences of the proposed action not adequately envisioned by the original EIS, such that the Navy's failure to act on it may be arbitrary or capricious. A Supplemental Environmental Impact Statement (SEIS) would assist in adequately addressing potential ill effects of SURTASS LFA to species in the marine environment offshore central California.

The Sanctuary recognizes that thus far the Department of Defense has spent in excess of \$350 million dollars developing the technology for this project. We applaud their dedication to ensuring, as stated in the FOEIS/EIS, "monies expended on the SURTASS LFA sonar program do not bind the Navy to deploy the SURTASS LFA sonar as proposed".

### Observers

The Department of the Navy proposes in the Final Environmental Impact statement (p.2-14) to use visual monitoring for marine mammals and sea turtles from the SURTASS LFA sonar vessel during daylight hours. Generally, cetaceans spend over 90% of their lives below the water surface. This being stated, it is easy to comprehend why ship-based observers may be unsuccessful in identifying potentially impacted animals.

### Research Activities

The Monterey area is recognized nationally and internationally for the extensive myriad research activities and organizations that are active in the region. Annually \$160 million is spent on marine research at twenty-six facilities within the region. This research is conducted on a year-round basis throughout Sanctuary waters, but typically more effort is expended during the summer months. Hundreds, if not thousands, of research projects are conducted in Sanctuary waters each year. Obviously, underwater sound would have undesirable ramifications on these on-going studies and projects.



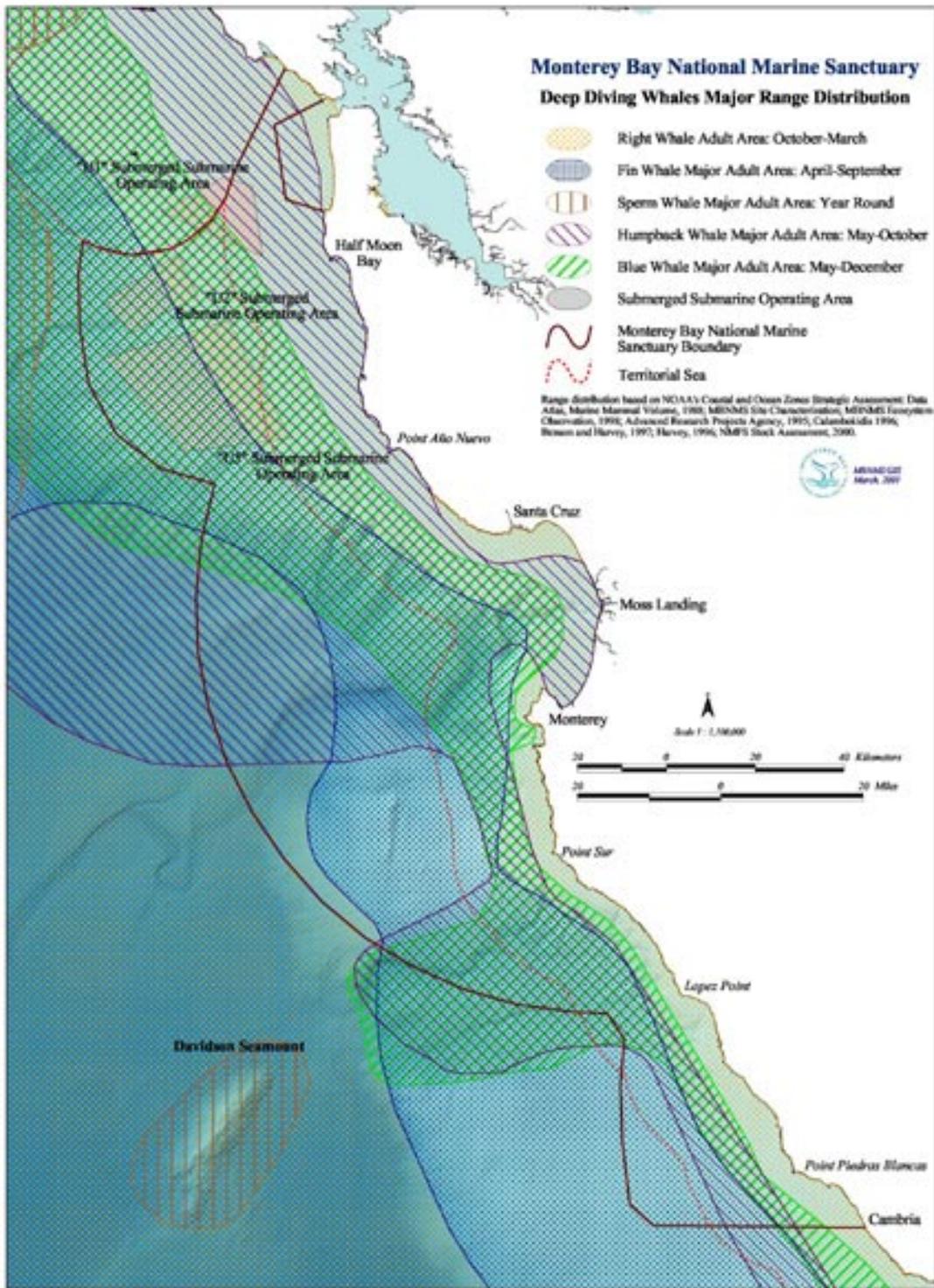
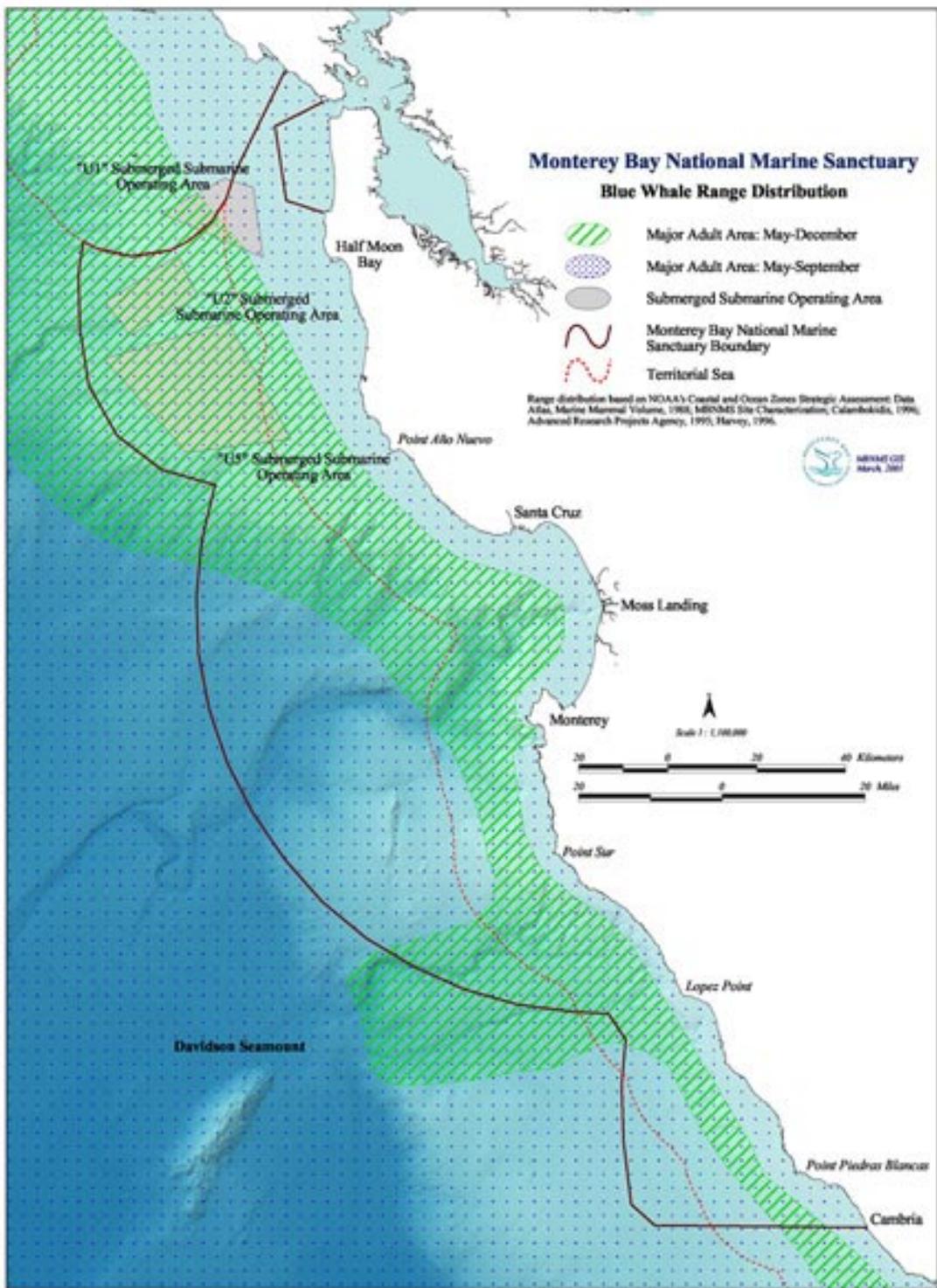
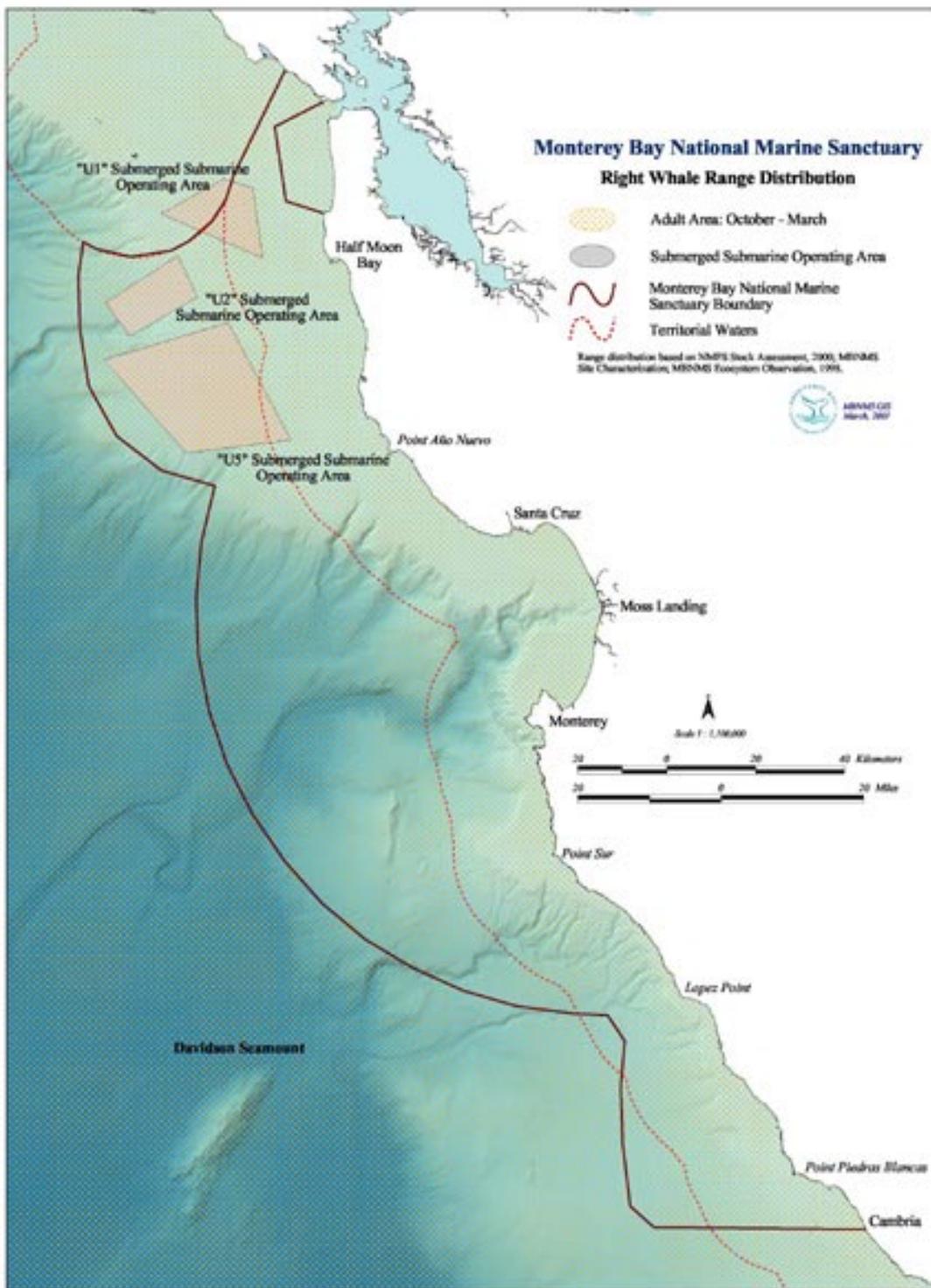


Chart 1





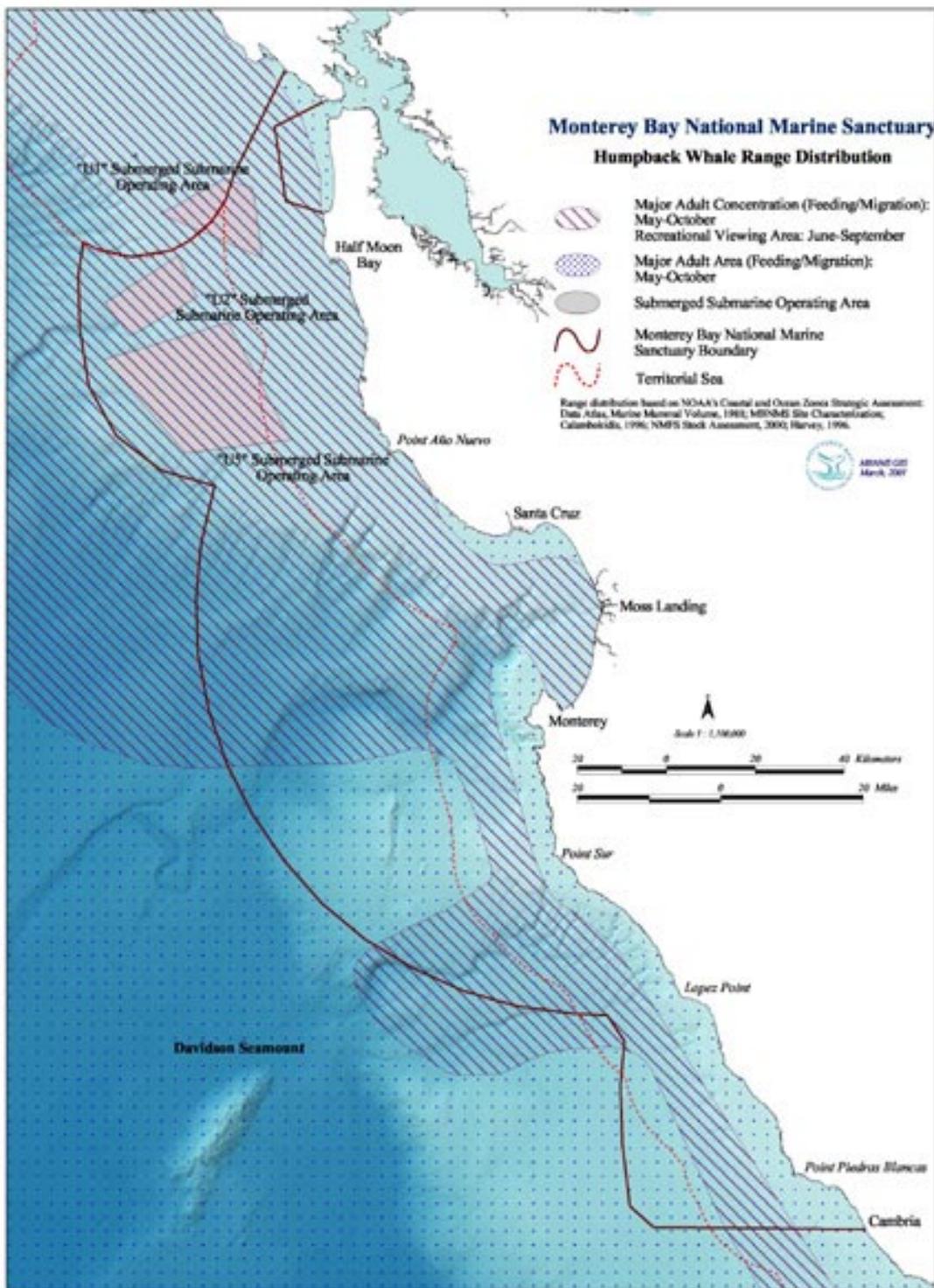


Chart 4

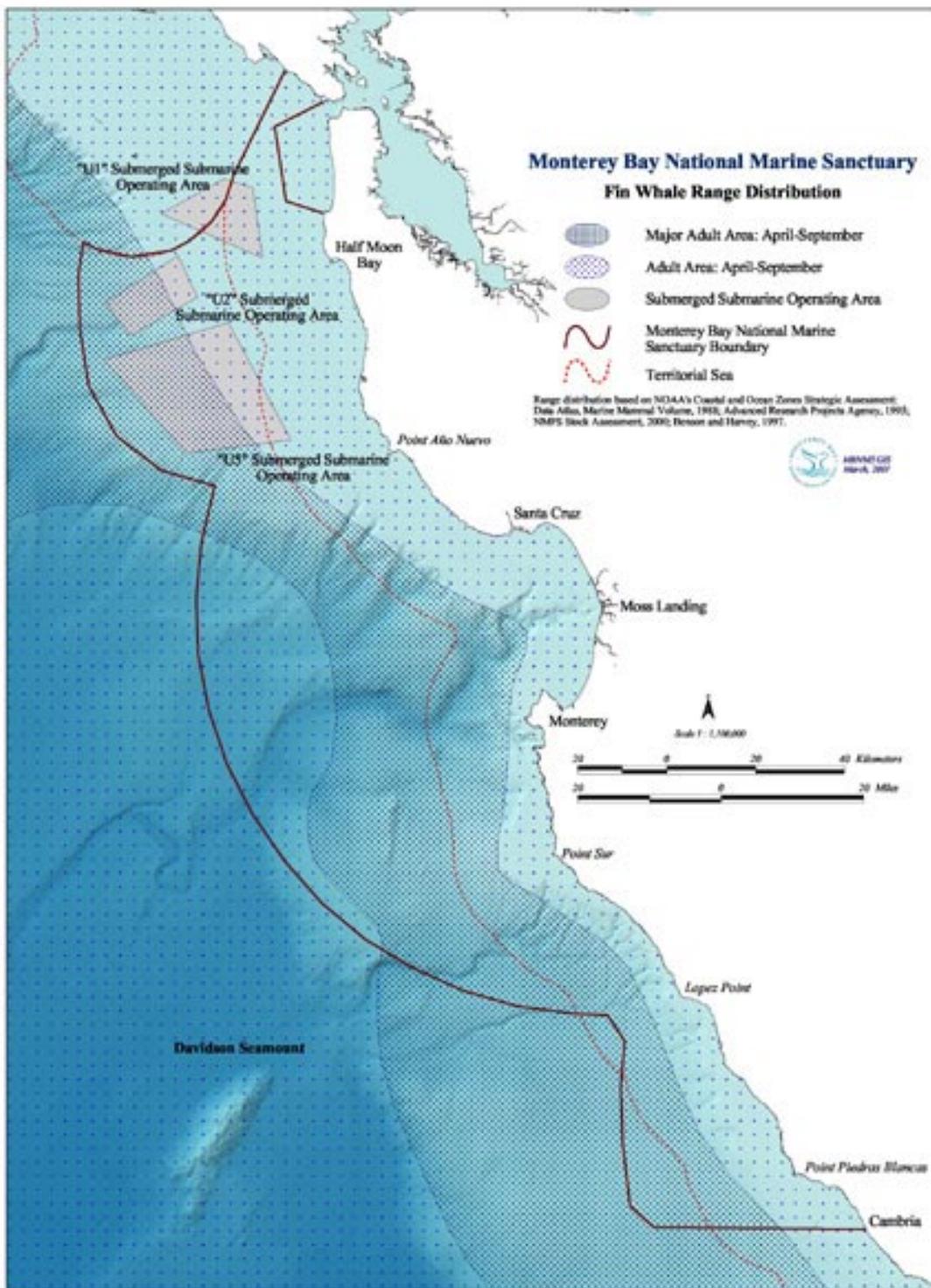


Chart 5

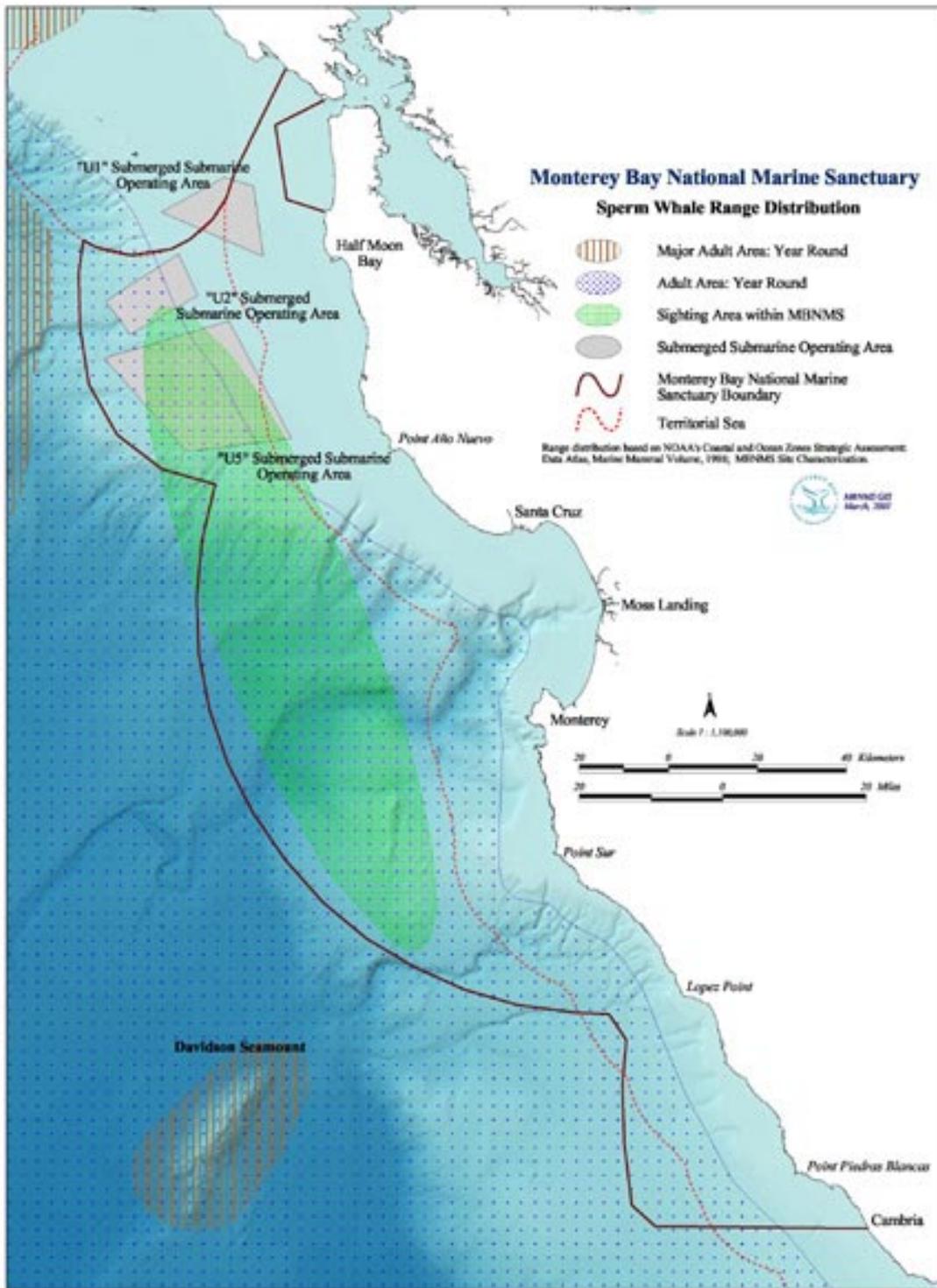


Chart 6

## Marine Mammal Abundance Information

Table 1

From: Forney et al. 2000, U.S. Pacific Marine Mammal Stock Assessments: 2000.  
NOAA Technical Memorandum NMFS/SWFSC 300

Species	Estimated Pacific		CA Estimated		Winter	Spring	Summer	Fall
	Population	CV	Population*	CV*				
Blue Whale	1940	0.15	not calculated		Migrating S	Migrating N	Present	Present
Humpback Whale	905	0.06	319	0.41	Migrating S	Migrating N	Present	Present
Fin Whale	1236	0.2	49	1.0	Lower #'s	Lower #'s	Present	Present
Minke Whale	631	0.45	73	0.62	Present	Present	Present	Present
Gray Whale	26635	0.1	not calculated		Migrating S	Migrating N	Absent	Absent
Northern Right Whale	Unknown		not calculated		Possible	Unknown	Unknown	Unknown
Sperm Whale	1191	0.22	892	0.99	Present	Peak	Peak	Present
Cuvier's Beaked Whale	5870	0.38	not calculated		Possible	Possible	Possible	Possible
Baird's Beaked Whale	379	0.23	not calculated		Lower #'s	Lower #'s	Possible	Possible
Mesoplodont Beaked Whales	4098	0.5	not calculated		Possible	Possible	Possible	Possible

\*Forney et al. 1995. (Not corrected for diving whales)

CV= Coefficient of Variation

Table 2

From: Final EIS/EIR for the California Acoustic Thermometry of Ocean Climate Project, April 1995  
Estimates of the stock of marine mammal species offshore central California

Species	Winter/Spring		Summer/Fall	
	Population	CV	Population	CV
Blue Whale	28	1.03	2198	0.36
Humpback Whale	375	0.36	609	0.41
Fin Whale	78	0.8	913	0.59
Minke Whale	71	0.61	569	1.1
Gray Whale	20869	0.34	not calculated	
Sei Whale	not calculated		61	1.21
Northern Right Whale	16	1.08	not calculated	
Sperm Whale	857(1286)*	1.05	725(1088)*	0.47
Beaked Whales (Cuvier's, Baird's, Mesoplodont)	426(852)*	0.38	1430(2860)*	0.91

\* Numbers in ( ) indicate estimates accounting for whales submerged during entire survey evolution

CV= Coefficient of Variation



## Sea Turtle Abundance Information

**Table 3**

**From: Final EIS/EIR for the California Acoustic Thermometry of Ocean Climate Project, April 1995  
Estimates of the stock of sea turtle species offshore central California**

<b>Species</b>	<b>Abundance</b>	<b>Remarks</b>
Leatherback Sea Turtle	Unknown	Note 13
Green Sea Turtle	Unknown	Note 11,12
Olive Ridley Sea Turtle	Unknown	Note 11
Loggerhead Sea Turtle	Unknown	Note 11

Note 11: NOAA-TM-NMFS-F/SPO-2, Dec 1992 (for eastern tropical Pacific [ETP])

Note 12: "Green turtles are the most commonly observed hard-shelled sea turtle on the western coast of the USA." (NOAA-TM-NMFS-SWFSC-186, Sep 193)

Note 13: Predominant sea turtle in central California coastal area (Eckert, pers. Comm., 1994)

