

## Section 2.3: BIOGEOGRAPHY OF MARINE MAMMALS

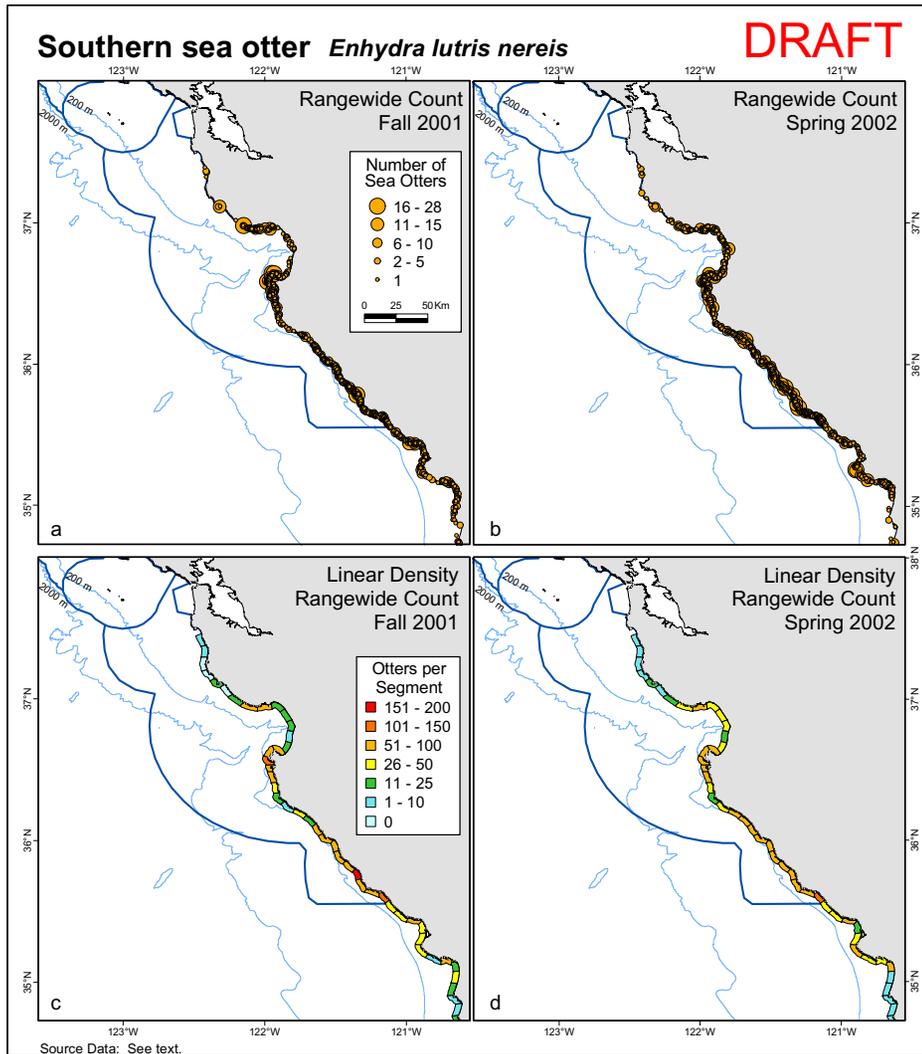


Figure 62. Maps for southern sea otter: rangewide count and linear density, fall 2001 and spring 2002.

### ABOUT THESE MAPS

Maps 62a and b display the locations of groups of southern sea otters during the Fall 2001 and Spring 2002 rangewide counts. Maps 62c and d summarize these rangewide count data into coastal strips approximately 10km in length, in order to display linear densities along the shore. The northern extent of the data is south of Half Moon Bay; sea otters are also present to the south of the mapped area.

### DATA SOURCES

Data were collected by wildlife biologists from the U.S. Department of the Interior (currently the USGS Biological Resources Division), California Department of Fish and Game, the Monterey Bay Aquarium, and trained volunteers during semi-annual rangewide counts in Fall 2001 and Spring 2002. The Fall 2001 count was conducted during the period 4-20 November 2001, the Spring 2002 count was conducted during the period 5-22 May 2002. The data set was provided by Mike Kenner, UCSC but is sourced to USGS; contact Brian Hatfield for more information.

### METHODS

The original data were entered from hand marked maps into a custom designed digitizing program which assigned coordinates to each observed sea otter group. Positions of animals toward the ends of the range and in Elkhorn Slough were not assigned coordinates by this program. Each group was also assigned to an ATOS (As The Otter Swims) number, which are numbers approximately 0.5 km apart along a smoothed 5 fathom contour line along the coast from Golden Gate to approximately Santa Barbara. These numbers were used to get approximate positions for otters without assigned coordinates.

A series of coastal segments approximately 2 km in width was created for display purposes. Each segment was approximately 10 km in length; divisions were based on the ATOS numbers described above. Twenty ATOS numbers approximately 500m apart were included in each segment. The coordinates of each otter group were used to place it within a particular segment, and the otters in each segment were summed. This provides an estimate of linear density (otters per segment or otters per 10km) since the segments were approximately 10km in length.

### RESULTS AND DISCUSSION

The southern sea otter (*Enhydra lutris nereis*) is one of three subspecies: southern (*E.l.nereis*), northern (*E.l.kenyonii*), and Russian (*E.l.lutris*). The southern sea otter is listed as threatened under the Federal Endangered Species Act, and depleted under the Marine Mammal Protection Act (MMPA). Under California Fish and Game Code, the southern sea otter is listed as a "fully protected" species. The southern sea otter generally inhabits the near-shore waters of the central California coast,

from Half Moon Bay to Goleta, just south of Point Conception with uncommon sightings of animals beyond these areas (pers. comm. B. Hatfield); the distribution of otters along the south end has been highly variable since the expansion of the sea otter range south of Point Conception (pers. comm. M.Harris). In the study area, sightings have occurred as far north as Point Reyes (Point Reyes Headlands, Double Point, Duxbury Reef; not shown on map; pers. comm. S. Allen). Sea otters occur along rocky shorelines with kelp beds (but also in open water habitats, sandy/soft bottom areas, and tidal estuaries) and in depths of water about 20-40 m (some to 60 m, and rarely to 100 m; M. Kenner pers. comm).

Overall, numbers of otters per segment were greater in the southern portion of the Monterey Bay National Marine Sanctuary. In the census of Fall 2001 (map a), greater numbers of otters per segment occurred along the Carmel coast and from Piedras Blancas south to Point San Luis. Seasonal changes in abundance and distribution of sea otters are believed to be affected by male movements during the period when most breeding occurs (June/July through October/November) when they move from the periphery of the range toward the center of the range in search of estrous females (Bonnell et al., 1983). From December to April, many males migrate to the range peripheries, perhaps in search of more abundant prey (M.Harris pers. comm.). However, this is not evident in the maps. Seasonal changes also are affected by factors such as weather, sea conditions and abundance of kelp canopy (see Reidman and Estes, 1990).

From 1983 until the mid 1990's, trends in spring southern sea otter counts indicated sea otters increased steadily; in the mid-to late 1990's, sea otter numbers declined (USFWS, 2000) and have since remained relatively constant (pers. comm. B. Hatfield). Sea otter count data is used as an index to assess trends in the population dynamics, not as a population estimate (pers. comm. M.Harris). The 2002 spring count was 1% below the 2001 count, from 2161 otters in 2001 to 2139 in 2002. The 2001 count was 6.7% below counts from the previous year (USGS 2002). Due to its small population size, the southern sea otter population is especially vulnerable to human disturbance, competition with fisheries, and pollution, including the threat of a major oil spill. The lack of population growth and recent decline coincides with an increase in mortality (e.g., infectious diseases, white shark attacks) as indicated by the number of beach-cast sea otter carcasses (Estes et al., 2003). Otters near heavy freshwater flows are three times more likely to have been infected by *Toxoplasma gondii*, a protozoan parasite caused by parasite eggs in cat droppings (see Miller et al., 2002).

Southern sea otters are key predators of benthic species (e.g. sea urchins, sea stars, mussels, clams, abalone, crabs) and octopus (see Riedman and Estes, 1990).