

because that would have required abandoning the other nuthatches with which it foraged, thereby increasing its vulnerability to predator attack. Also, both the nuthatch and woodpecker may have obtained liquid water at another time during the day, which would have the effect of reducing the largest energetic cost (converting ice to water) in maintaining daily water balance. Nevertheless, the behavior of birds might change significantly during lengthy periods of extreme cold where temperatures are greatly below freezing, requiring a substantial energetic cost to maintain daily water balance that could be an important influence on each bird's daily time and energy budgets.

LITERATURE CITED

- BERTEAUX D. 2000. Energetic cost of heating ingested food in mammalian herbivores. *Journal of Mammalogy* 81:683–690.
- GHALAMBOR CK, MARTIN TE. 1999. Red-breasted Nuthatch (*Sitta canadensis*). In: Poole A, Gill F, editors. *The birds of North America*, No. 459. Philadelphia, PA: The Birds of North America, Inc. 28 p.
- HENDRICKS P. 1996. Ingestion of snow and ice by Pileated Woodpeckers and Northern Flickers. *Northwestern Naturalist* 77:20–21.
- KINGERY HE, GHALAMBOR CK. 2001. Pygmy Nuthatch (*Sitta pygmaea*). In: Poole A, Gill F, editors. *The birds of North America*, No. 567. Philadelphia, PA: The Birds of North America, Inc. 32 p.
- MATTHYSEN E. 1998. *The Nuthatches*. London: T & AD Poyser. 315 p.
- MUGAAS JN, TEMPLETON JR. 1970. Thermoregulation in the Red-breasted Nuthatch (*Sitta canadensis*). *Condor* 72:125–132.
- PRAVOSUDOV VV, GRUBB, TC JR. 1993. White-breasted Nuthatch (*Sitta carolinensis*). In: Poole A, Gill F, editors. *The birds of North America*, No. 54. Philadelphia, PA: The Academy of Natural Sciences, and Washington, DC: The American Ornithologists' Union. 16 p.
- WITHGOTT JH, SMITH KG. 1998. Brown-headed Nuthatch (*Sitta pusilla*). In: Poole A, Gill F, editors. *The birds of North America*, No. 349. Philadelphia, PA: The Birds of North America, Inc. 24 p.
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EXTRALIMITAL RECORDS OF THE SEA OTTER (*ENHYDRA LUTRIS*) IN NORTHERN CALIFORNIA

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Key words: Sea Otter, *Enhydra lutris*, extralimital records, California, Southeast Farallon Island, Humboldt County

The Sea Otter (*Enhydra lutris*) is one of the most well-known and distinctive marine mammals off the west coast of North America. Three subspecies of Sea Otter are recognized worldwide, 1 in California (*E. l. nereis*), 1 in Asia (*E. l. lutris*), and 1 in Alaska, British Columbia, and Washington State (*E. l. kenyoni*) (Reeves and others 2002; Lance and others 2004). When present in large numbers, Sea Otters are readily observed foraging, resting, or breeding in large beds of kelp located near shore (Kenyon 1969; Reidman and Estes 1990).

In the early 18th century, the Sea Otter had a

widespread distribution in the coastal waters of the North Pacific Ocean (Reidman and Estes 1990). However, the fur trade of the 18th and 19th centuries extirpated this species from most of its range. Historically, Sea Otters were found from northern Hokkaido Island, Japan, and the Kuril Islands in the western Pacific, the Aleutian Islands and mainland Alaska, and British Columbia, Washington, Oregon, California and the northern portion of Baja California Sur, Mexico (27°N latitude) in the eastern Pacific. Additionally, Sea Otters occurred offshore on Isla Guadalupe, Mexico, on the Channel Islands of Southern California, and the Farallon Islands west of San Francisco, California (Reidman and Estes 1990).

After the United States, Japan, Russia, and Great Britain negotiated a treaty prohibiting further hunting of Sea Otters in 1911 (US Fish and Wildlife Service 2003), the species recovered quickly, re-colonizing the northern portion of its range with population estimates of approximately 100,000 by 1980 (Rotterman and Simon-Jackson 1988; Estes 1992). Populations also were translocated with mixed results (US Fish and Wildlife Service 2003; Lance and others 2004) to portions of Alaska, British Columbia, Washington, Oregon, and California. Currently, the 3 subspecies occupy approximately 60% of their former range (US Fish and Wildlife Service 2003; Lance and others 2004). Recent population expansions have been closely linked to population density and prey availability (Estes 1990; Reidman and Estes 1990). However, despite the species capacity for expanding its range when proper ecological conditions exist, Sea Otters are non-migratory and rarely wander beyond the limits of their home range (Miller 1974; Estes 1990).

The Southern Sea Otter (*E. l. nereis*) markedly expanded its range within California between 1938 and the late 1980s, moving north from Point Sur to Half Moon Bay and south to Point Conception (Kenyon 1969; Wild and Ames 1974). Through the 1980s and 1990s, the Southern Sea Otter continued to expand its range southward and is now observed regularly south of Point Conception. However, little northward movement of the Southern Sea Otter has been documented (Lubina and Levin 1988; US Fish and Wildlife Service 2003). Recent population estimates of the state-wide range of the Southern Sea Otter are between 1250 and 2300 animals (US Fish and Wildlife Service 2003).

Herein, we report 5 extralimital sightings of the Southern Sea Otter in northern California, including 3 sightings from San Francisco County and 2 from Humboldt County. These observations spanned a 20-y period from 1986 to 2005.

We observed 3 Southern Sea Otters at Southeast Farallon Island (SFI, 37°42'N, 123°00'W) from 1986 to 2005. Stallcup (1992) reported sighting a single 1-m long individual at SFI between 24 and 28 October 1986. The individual was observed in Fisherman's Cove on the afternoon of 24 October, appearing healthy and foraging on Purple Sea Urchins (*Strongylocentrotus purpuratus*). The animal was seen later on 24 October immobile while floating away from the

island in an easterly direction. Between 25 and 28 October 1986, the animal was observed on the north side of the island. The arrival day weather included cloudy skies, 10-knot northwest winds, a 2-m west swell, and 2-km visibility. The 2nd individual was observed at SFI on 11 and 14 June 2001. The animal was seen foraging in Sea Lion Cove on 11 June, and again on 14 June at Aulon Peninsula on shore among hundreds of California Sea Lions (*Zalophus californianus*). The size of the animal was not noted. The arrival day weather included cloudy skies, 20-knot northwest winds, a 1-m northwest swell, and 10-km visibility. The 3rd individual was observed in Mirounga Bay, SFI, on 4 October 2005 during the afternoon from approximately 14:00 to 15:00. The 1-m long animal appeared healthy and was observed preening for approximately 1 h as it floated eastward and out of view of the observers. They noted that large free-floating kelp beds were present around the island on this day, a rare occurrence at SFI. Arrival day weather was clear skies, 15-knot winds out of the northwest, a 2-m northwest swell, and >50-km visibility.

We also observed 2 Southern Sea Otters in Humboldt County, California during the summer of 2005. The 1st individual was observed on 4 August approximately 2000 m from shore and 4 km north of the Humboldt Bay entrance channel (40°48'N, 124°14'W; 20 meters depth). We observed and video taped this animal for approximately 3 min at a distance of 80 to 100 m. The animal appeared to be eating a small food item, preening, and resting on its back. The weather was overcast skies with variable winds and a 1.2-m northwest swell. The 2nd individual was observed on 5 August approximately 3 km from shore and 10 km north of the Trinidad harbor (41°10'N, 124°09'W; 20 meters depth). We observed and video taped this animal for approximately 2 min at a distance of 80 to 100 m as it initially rested on its back and then dove several times before we boated away. The weather was overcast with approximately 7-knot winds out of the northwest and a 1.7-m northwest swell.

These extralimital records of Southern Sea Otters in San Francisco and Humboldt Counties are perhaps the 1st observations since the Southern Sea Otter was eradicated from this portion of its historic range. These observations show a poten-

tial by Southern Sea Otters to expand their current range both longitudinally and offshore.

This discussion focuses on the significance of our extralimital records, with the assumption that these individuals derive from the Southern Sea Otter population. We base this assumption on the linear distance between our sightings and stable population stocks, where the distance between Half Moon Bay and Trinidad is 430 km while it is 800 km from Destruction Rock on the Olympic Peninsula to Trinidad. Additionally, the Washington State population has not shown any significant movement southwards from its breeding range (Lance and others 2004). Furthermore, historic records suggest that the subspecies occurring off both northern California and southern Oregon was *E. l. nereis*, rather than *E. l. kenyoni* which is the subspecies historically found on and re-located to the Olympic Peninsula (US Fish and Wildlife Service 2003; Lance and others 2004).

Despite recent undulations in Southern Sea Otter populations, specifically, numbers have steadily increased since annual surveys began in the 1970s (US Fish and Wildlife Service 2003). Along with the increasing population, the continued expansion of the Southern Sea Otter southward in the 1980s and 1990s has been well documented (Lubina and Levin 1988; Estes 1990; Laidre and others 2001). Therefore, it is feasible that the Southern Sea Otter has recently begun to similarly investigate the northern portions of its historic range.

Conservationists, including those managing national and state Marine Protected Areas, the Marine Life Protection Initiative, and the California Coastal National Monument should be aware of the potential for this protected subspecies to occur and even breed within their protected areas. Coastal management agencies should be prepared for future reports of the longitudinal and westward range expansion of this endangered subspecies. While our observations report only 5 individual animals north of the established range of Southern Sea Otters, it might be an indication of a larger but unidentified population movement.

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LITERATURE CITED

- ESTES JA. 1990. Growth and equilibrium in Sea Otter populations. *Journal of Animal Ecology* 59:385–401.
- ESTES JA. 1992. Status of Sea Otter (*Enhydra lutris*) populations. In: Reuther C, Rochert R, editors. Hankensbuttel, West Germany: Proceedings of the Fifth International Otter Colloquium. p 22–35.
- KENYON KW. 1969. The Sea Otter in the eastern Pacific Ocean. Washington, D.C: North American Fauna 68. U.S. Bureau of Sport Fisheries and Wildlife. 352 p.
- LAIDRE KL, JAMESON RJ, DEMASTER DP. 2001. An estimation of carrying capacity for Sea Otters along the California coast. *Marine Mammal Science* 17: 249–309.
- LANCE MM, RICHARDSON SA, ALLEN HL. 2004. Washington state recovery plan for the Sea Otter. Olympia, WA: Washington Department of Fish and Wildlife. 91 p.
- LUBINA JA, LEVIN SA. 1988. The spread of a re-invading species: range expansion in the California Sea Otter. *The American Naturalist* 131:526–543.
- MILLER DJ. 1974. The Sea Otter, *Enhydra lutris*, its life history, taxonomic status, and some ecological relationships. California Department Fish and Game, Marine Resources Leaflet 7:113.
- REEVES RR, STEWART BS, CLAPHAM PJ, POWELL JA. 2002. Guide to marine mammals of the world. New York: Alfred A. Knopf Press. p 42–45.
- REIDMAN ML, ESTES JA. 1990. The Sea Otter (*Enhydra lutris*): behavior, ecology, and natural history. US Fish and Wildlife Service, Biological Report 90(14). 126 p.
- ROTTERMAN LM, SIMON-JACKSON T. 1988. Sea Otter. In: Lentfer JW, editor. Selected marine mammals of Alaska. Springfield, VA: National Technical Information Service No. PB88178462. p 237–275.
- STALLCUP R. 1992. Ocean birds of the nearshore Pacific. Stinson Beach, CA: Pt. Reyes Bird Observatory. p 186–187.
- US FISH AND WILDLIFE SERVICE. 2003. Final Revised Recovery Plan for the Southern Sea Otter (*Enhydra lutris nereis*). Portland, Oregon. 165 p.
- WILD PW, AMES JA. 1974. A report on the Sea Otter, *Enhydra lutris L.*, in California. Long Beach CA: Marine Resource Technical Report 20. California Department of Fish and Game. 94 p.

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