PROBLEMS OF MANAGING SEA OTTERS IN CALIFORNIA

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ABSTRACT

The sea otter, Enhydra lutris, historically occurred along the coast throughout much of the north and eastern Pacific Ocean. Fur trade harvest during the 18th and 19th centuries extirpated it from most of its range. Remnant populations survived in Russia, Alaska and California. Whereas the populations in Russia and Alaska are increasing and are now found throughout most of their former range, the population in California is still greatly reduced in range and number. The reasons for this lack of growth are unknown. Because of their reduced range and population size, the California sea otter population is more easily threatened by potential oil spills, accidental drownings in gill nets, and intentional killing of otters by man. In 1977, the U.S. Fish and Wildlife Service listed the California sea otter population as threatened. A recovery plan has been developed which proposes to translocate California sea otters to establish one or more additional colonies. The more important management problems are: (1) identifying factors responsible for limited population growth, (2) determining the location and number of translocation sites, (3) minimizing the extent of conflict between sea otters and local shellfisheries, and (4) minimizing the risks from oil spills and other human activity.

INTRODUCTION

The sea otter, Enhydra lutris, inhabits a narrow ecological zone of the near shore community and prefers rocky shoreline with kelp beds. Historically, the species was distributed throughout much of the northern Pacific. Its range extended from northern Hokkaido, Japan, through the Aleutian Archipelago, Prince William Sound and southeastern Alaska to Punta Abreojos, Baja California. Abundance was greatly reduced by human exploitation as otters were harvested for their pelts. Between 1751 and 1911, the distribution was reduced to 13 known remnant populations; one each at the Kuril Islands and Kamchatka; one in the Commander Islands; five in the Aleutian Islands and along the Alaska Peninsula; and one each at Kodiak Island, Prince William Sound, the Queen Charlotte Islands, central California, and San Benito Islands. By 1920, populations at San Benito Islands and Queen Charlotte Islands were extinct (Kenyon 1969). Thus, the California population is the only remnant of those otters that historically occurred along the west coast.

Today much of the original range is occupied from the Kuril Islands, across the north Pacific to Prince William Sound. The California population has not increased significantly since about 1973. Translocations of Alaskan otters have established new populations in southeast Alaska and at Vancouver Island. The success of an additional translocation in Washington is still in doubt (R. Jameson, personal communication, 1982, Fish and Wildlife Service, San Simeon, CA).

The plight of the sea otter was first legally recognized in 1911 when this species was included under the provisions of the International Fur Seal Treaty. In 1913, the California State Legislature declared the sea otter a fully protected species.

In 1972, protective responsibility for sea otters was assigned to the Federal Government under the Marine Mammal Protection Act (MMPA). Further protection was awarded the California sea otter population in 1977 when the Secretary of the Interior, in accordance with the Endangered Species Act of 1973 (ESA), determined that this population was threatened (U.S. Fish and Wildlife Service 1977). The Federal Register listing identifies the California population as the southern sea otter, Enhydra lutris nereis. Although the validity of the subspecific status requires further investigation (Davis and Lidicker 1975; Roest 1976), it is the population of sea otters in California that is listed as threatened regardless of taxonomic status. The main potential and chronic threat to this population and its habitat is offshore oil spills, especially those related to tanker traffic.

Pursuant to the ESA, the U.S. Fish and Wildlife Service (FWS), in coordination with the California Department of Fish and Game (CDFG), identified those actions necessary to restore the southern sea otter to a non-threatened status. The Southern Sea Otter Recovery Plan was completed and signed by the Director of the Fish and Wildlife Service in February 1982.

MANAGEMENT PROBLEMS AND CONCERNS

Several problems affecting the status and restoration of the southern sea otter are identified in the Southern Sea Otter Recovery Plan. Those major problems are: the apparent cessation of population growth, intentional and unintentional take, conflicts with shellfish resources, and threats due to oil spills and other toxic contaminants. The population has experienced no significant growth in the past 10 years. Although during most of this period there was an increase in range, northward expansion ceased in 1977. Several reasons could contribute to the lack of population growth; reduced recruitment, emigration, and/or excessive mortality; the latter apparently being the most probable (U.S. Fish and Wildlife Service 1982).

Based on a census by CDFG and FWS in November 1982, the sea otter population in California numbers about 1200 animals, excluding dependent pups. The population ranges over about 320 km of coast, distributed between Soquel Point, Santa Cruz County on the north and Pismo Beach, San Luis Obispo County on the south. However, densities and distribution of sea otters are neither uniform nor static. The center of the range is inhabited primarily by females and their pups. Immature and adult males concentrate at the ends of the range during winter and early spring. During summer and fall these concentrations disperse, presumably as mature males seek to establish territories or to cruise the coast in search of estrous females. Breeding success appears to be normal. Dependent pup:independent animal ratios (15-16:100) observed in the California population are similar to those observed in Alaska (Kenyon 1969). Although a few individual, nomadic animals are found outside this "established" range, there is no evidence that these extralimital otters are breeding.

Sea otter mortality has been monitored since 1968. Post-mortum examination of sea otters found on or near beaches have been conducted by CDFG. Assigning causes of death with certainty is difficult, particularly because of the decomposed state in which many animals are recovered. In 1982, 58 percent of the recovered otters were catalogued as cause of death unknown or uncertain. The extent of predation on sea otters is unknown; however, evidence does exist that the white shark (Carcharodon carcharias) attacks sea otters (Orr 1959; Morejohn et al. 1975; Ames and Morejohn 1980). Man caused mortality has been positively identified also. In 1982, six percent of the recovered otters were found to have been shot and another six percent were known to have drowned from entanglement in gill nets (J.A. Ames, 1982, personal communication, CDFG, Monterey, CA). Gill nets are commonly used within and adjacent to the sea otter's range to capture rockfish and bottom fish (e.g. halibut). The impact of human activities is unknown but because of the sea otter's reduced range and population size, these impacts could be significant.

Abundance or availability of food can also restrict population growth. Food abundance probably is not restricting growth of the sea otter population. However, in some areas, social interaction may be limiting food availability to juvenile otters. Higher levels of juvenile mortality are recorded for some areas (R. Hardy, personal communication, 1982, CDFG, Morro Bay, CA). Sea otters forage opportunistically on a variety of macroinvertebrates

ranging from large abalone (Haliotis spp.) to small turban snails (Tegula spp.). Preferred prey species are sea urchins (Strongylocentrotus spp.), abalone (Haliotis spp.), rock crab (Cancer spp.), and clams (several genera). Eyesight and tactile sensation (vibrissae and forepaws) are used for locating prey. Sea otters actively forage day and night, with some otters known to spend a third of their time foraging (Loughlin 1977; Shimek and Monk 1977). This active behavior is necessary to sustain an elevated metabolism. Captive adult sea otters require between 190 and 253 kcal/kg/day (Kenyon 1969; Costa 1976). To satisfy this requirement, otters eat approximately 20 to 25 percent of their body weight every day (Kenyon 1969), with an assimilation efficiency of 80 to 85 percent (Fausett 1976).

An elevated metabolism is one mechanism this species has for thermal regulation. Another is its thick fur. Sea otters have little subcutaneous fat for energy storage and no layer of blubber as do pinnipeds and cetaceans. Insulation from cold sea water is provided by air trapped in the fur (Morrison et al. 1974). This insulation is eliminated if the fur is contaminated and becomes matted. Studies have confirmed that oil mats sea otter fur and that even a small amount of contamination can reduce thermoregulatory ability and lead to death (Williams 1978, Siniff et al. 1982). Presumably, death results from hypothermia.

Risks from oil spills currently exist throughout the sea otter's range. Tanker traffic parallels the coast and oil-transfer marine terminals bracket the range. Furthermore, both the Federal and State governments are interested in developing offshore oil reserves, especially those near the southern terminous of the sea otter's range. As oil related activities increase in these areas, so does the potential for oil spills. Contamination of sea otter habitat by other sources (e.g., sewage outfalls) is a concern also. The extent of this problem needs to be further investigated.

Protecting the existing California sea otter population and habitat requires immediate attention. Marine pollution could degrade sea otter habitat. At present, very little baseline data are available on the effects of existing discharge of sewage and other pollutants into the sea otter range. Without these data, recommendations cannot be made for maintaining the health and stability of the nearshore ecosystem.

Other threats to the population, such as illegal take, can possibly be minimized once their significance is determined. Preventing the shooting of sea otters, or apprehending those that shoot them, has proven to be very difficult. Because of the isolated nature of the central California coast, the shooting of an otter can easily go undetected. Otters that are shot are only recovered once they wash ashore. The total number of otters shot annually is unknown. Law enforcement efforts have been increased and efforts to stimulate public awareness should provide some help.

Sea otters drowning in gill nets is a problem that is somewhat easier to manage. Drownings are only confirmed by having observers monitor nets being pulled. The extent of sea otter entanglement relative to sea otter distribution and fishing activity can be determined provided a sufficient number of observers are available. This information, once obtained, should be sufficient for recommending specific sea otter protective measures.

The threat of oil spills, however, constantly hovers over the sea otter population. Minimizing this threat within the sea otters range is difficult because a spill would most likely result from an accident, i.e., an unpredictable occurrence. The existing ability to contain an oil spill in the open ocean or to isolate sea otters from contamination is inadequate to insure their protection. Consequently, even with increased efforts to protect the sea otter population and habitat, the population still will remain vulnerable to the risk of oil spills.

Restoration of the southern sea otter can be achieved by allowing the population to increase naturally in size and range over a larger expanse of the California coast and/or by reintroducing otters into other areas along the coast. Natural range expansion is probably insufficient to assure restoration of the population because the rate of offshore oil development and other human activities within and adjacent to the sea otter range is increasing whereas the sea otter population is not. Translocating sea otters appears to be the most effective and reasonable management action to insure that the population will not likely be decimated by a catastrophic event or a series of small scale perturbations.

The translocation of southern sea otters will increase the distribution and the size of this population. By establishing one or more additional colonies of sea otters, the threat from potential oil spills will be diminished if oil spill risks associated with the potential colony sites are absent or relatively minimal and are relatively independent from those associated with the parent population. The southern sea otter would further benefit from a reintroduction if the preferred site was one where intentional and accidental killing of sea otters was absent or minimal, and/or where protective measures could be effectively implemented.

Associated with any translocation are two aspects of resource utilization by man that conflict with sea otter recovery needs and which require special management attention. These aspects are existing shellfisheries and potential oil development. There is a very real conflict between commercial shellfisheries and sea otters. Many of the sea otter's preferred prey species are also highly prized by man for commercial and recreational harvest. Conflicts arise whenever sea otters expand their range into shellfish areas. The presence of sea otters undoubtedly precludes local abalone or urchin fisheries. The extent of the impact on either the lobster or crab fishery is unknown.

However, the perception of impacts that will result from the recovery effort must not be myopic. Surely, the immediate needs, conflicts, and problems must be addressed. However, the long term implication(s) of sea otter translocation(s) must be considered. There may be benefits derived by man in establishing additional colonies of sea otter. The potential for this possibility cannot be dismissed. There has been essentially no investigation of the resource economics as they relate to the presence and absence of sea otters. Without such information an objective assessment cannot be made. There are some data that suggest that the presence of sea otters enhances kelp (Macrocystis sp.) growth which also results in a change in the kelp bed community. Additional studies will send valuable insight into the relationship between sea otters and the nearshore community and help provide information necessary for long term management decisions.

Furthermore, although the risks associated with oil spills pose a threat to sea otters, the potential conflict between future oil development and the restoration of the sea otter population is more aptly qualified as perceived than as real. The presence of one does not automatically preclude the other. It is not at all improbable that a reasonable and prudent scheme for future oil development can be implemented concurrent with recovery efforts for the sea otter. In fact, as the recovery effort for the sea otter advances, the potential for population threatening conflicts with oil development should deminish.

RESOLUTION OF THE PROBLEMS

In order to protect the existing population it is essential to understand why the population has apparently stopped growing. The California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (FWS) are involved in obtaining data necessary to monitor and assess the status of the population. Baseline data is being collected on the dynamics of the nearshore community in the presence and absence of sea otters. And, an increased effort is being made by FWS and CDFG to recover dead sea otters and thereby identify local and regional mortality patterns.

The FWS and CDFG are undertaking efforts to minimize conflicts associated with existing fisheries. Gill net fishing is being monitored in an effort to identify the significance of gill net caused mortality. This information should be useful in developing a preferred solution to the problem. The CDFG is also investigating techniques for influencing sea otter movement. If successful, such techniques will prove invaluable for translocation needs, protecting shellfish zones, and protecting sea otters from oil spills.

Efforts are underway to minimize the impact from a potential oil spill. The State is developing an oil spill contingency plan. Industry is improving the effectiveness of oil spill containment and cleanup equipment. Also, Section 7 of the Endangered Species Act (ESA) provides legal protection for the southern sea otter while providing a mechanism to minimize the extent of conflict with future development plans.

In order to insure that the existing population is not decimated by an oil spill, sea otters will be translocated to establish at least one new colony. Efforts are underway to identify potential translocation zones. A FWS contract to identify potential translocation zones should be completed by March 1984. This project is designed to identify good sea otter habitat in areas of minimum risk, and to identify the nature and extent of resource conflicts within these areas. This information will assist the FWS and CDFG in selecting a preferred translocation site. Four potential sites are presently being considered: northern Washington; southern Oregon; northern California; and San Nicolas Island, California.

The identification of recovery tasks is relatively easy. The difficulty lies in the successful implementation of these tasks. The problems are few but the issues are complex and some even volatile. The resolution of the problems can only come with the determination of how many additional colonies need to be established and the minimum size for any colony. The decisions here are not ones that can be made arbitrarily.

The mandates of the ESA and Marine Mammal Protection Act (MMPA) outline specific requirements which must be defined as they pertain to the southern sea otter situation. The requirements of the MMPA are broader in scope than are those of the ESA. The MMPA requires that the southern sea otter population be maintained at its optimal sustainable level within available habitat, commensurate with sound management policies for maintaining the health and stability of the near shore ecosystem of which they are a part. Defining the concept of optimal sustainable population requires an understanding of what constitutes a healthy and stable nearshore ecosystem (including sea otters) and how human activities affect this system. The biological information necessary to define this concept would best be achieved by combining existing data with observations of changes in the near shore community resulting from a translocation. Consequently, the ultimate decision on the number and size of new colonies, and how to manage the system may not be made until sometime after the first translocation.

As with any resource management effort, the problems cannot be resolved by one person or even one agency acting within a vacuum. The sea otter recovery program will only be successful if the responsible Federal and State agencies coordinate their programs to maximize their effectiveness.

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