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The Role of Rehabilitation in Sea Otter Conservation Efforts

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Rehabilitation programs for sea otters, as well as other wildlife, are supported by arguments based on psychological impacts on the public, practicality, knowledge enhancement, and the value of the individual animal as well as the species. Conversely, potential deleterious effects upon the gene pool, stress to individual animals, the potential spread of disease, and inappropriate use of limited resources argue against rehabilitation efforts. A good example of this conflict was the rescue of sea otters following the Exxon Valdez oil spill. Rehabilitation efforts were disappointing, with nearly one quarter of the rehabilitated and released sea otters presumed to have died soon after release, based on post-release monitoring of radio instrumented animals (Monnett et al. 1990) . Furthermore, the potential contribution of the rehabilitation effort has been questioned in view of the fact that although a large number of sea otters were impacted (estimated at 1000 to more than 5000 individuals) this number does not represent a significant portion of the total Alaskan population of 150,000 - 200,000 otters (Garrott et al., 1993). This paper will look at the lessons of the Exxon Valdez spill and will examine the questions: how will these issues influence the role of rehabilitation programs in future sea otter conservation?

Public perception of rehabilitation and conservation

Dead oiled sea otter pup, resulting from the *Exxon Valdez* oil spill. Photograph courtesy of Friends of the Sea Otter.

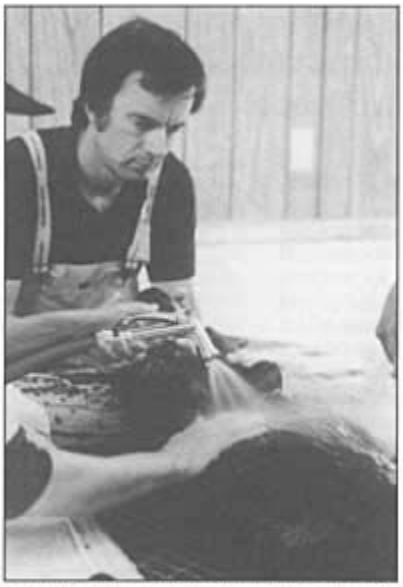
The U.S. Environmental Protection Agency (EPA) has recognized the dichotomy between public perception and scientists' understanding of environmental problems. Action and priorities are often tempered by the influence of public concerns on national legislation and funding. As a result, the EPA budget and staff are often directed at environmental problems perceived as serious by the general public but not necessarily justifiable at the population conservation level (Environmental Protection Agency 1990). For example, oil spills were considered a relatively low risk problem due to the resiliency of ecosystems to such short-term insults. Despite this, considerable resources have been directed towards the mitigation of the impact of oil spills on wildlife. In the aftermath of the Exxon Valdez oil spill, for example, 225 sea otters were rehabilitated at a cost of $18.3 million, or over $81,300 per otter.

Historically, wildlife rehabilitation efforts in the United States have reflected the public's desire to serve as stewards of the environment. The reverence for life that evolved from our historic traditions is denigrated if the needs of fellow human beings or animals are ignored. The moral issue becomes an even more compelling force for rehabilitation if animals are endangered as a result of a human-caused disaster. Our society willingly assumes responsibility for the mitigation of such disasters.

Psychological factors are closely tied to moral issues as compelling forces for rehabilitation. Strong human/animal bonds result in people being negatively impacted when confronted by animals in distress. Preventing rescue attempts would increase the feelings of helplessness among those sensitive to animal issues. In contrast, people experience a psychological boost through the sense that they are returning something to the world by caring for distressed animals.

Rehabilitation programs broaden community ownership of problems in the environment and empower people to act and learn about those problems. Educational programs are crucial for linking the immediate satisfaction of caring for an individual animal with larger conservation issues. Programs at the public aquaria and rehabilitation facilities provide opportunities to view animals not easily seen in the wild, resulting in a sense of caring and respect for the animals. Public education on the value of these animals

towards conservation of the population is necessary in developing cooperative conservation programs involving the public, researchers, rehabilitation facilities, aquaria, government officials, and animal interest groups.



Sea otter being washed as part of the rehabilitation effort after the *Exxon Valdez* oil spill. Photograph courtesy of Friends of the Sea Otter.

The institution of a cooperative conservation program will require a fundamental change in thinking by the general public, which should be based on a foundation of scientific fact. Rather than focus on the individual animal as has been the case to date, attention must be redirected toward the species and population levels. Thus, the scientific and rehabilitation community need to develop a more responsible attitude toward the relationship between basic biological research and its application to environmental problems.

The individual versus species conservation

One of the primary criticisms of rehabilitation programs has been their focus on the individual animal rather than the needs of the population or the species. This is complicated by media-created "personalities:" such as Lazarus, the sea otter who made a convenient on-camera recovery during the Exxon Valdez spill, and April, the rehabilitated sea otter released by the Monterey Bay Aquarium who was the subject of periodic cover stories in local papers for months. Public empathy for sea otters and the promotion of rehabilitated animals as personalities creates a fertile environment for financial, popular, or political gain.

Debates concerning rehabilitation programs often reveal a basic misunderstanding by the general public of species conservation and the role of scientific research and rehabilitation in the preservation of biodiversity. They also illustrate the problem of trying to reach consensus amid the conflicting goals associated with individual animal rights and the conservation of an entire species or population. In reviewing the costly sea otter rehabilitation programs following the Exxon Valdez oil spill, Estes (1991) questioned the value of efforts focussed on individual animals when resources are limited and a population or species is not threatened with extinction.

The individual sea otter in a rehabilitation program, however, provides much more than a human interest personality. These animals represent an invaluable link between the scientific community and wild populations. Combining the expertise and resources of zoological parks, rehabilitation personnel, and environmental scientists is an important dimension to the timely conservation of the species.

Individual otters as representatives of the species

The sheer number of species facing extinction far outweighs our capabilities to either house or study them (Soulé et al. 1986). In addition, there is a paucity of information on the basic physiology, behavior, immunology, genetic diversity, interactions and environmental requirements of sea otters and their prey. Unfortunately, this basic information is critical for identifying the environmental demands of a population and for developing intelligent management plans (Ralls and Brownell 1989). Rehabilitation programs offer innumerable research opportunities, and the knowledge gained may have significant long-term importance for the survival of the population as a whole. Work on individual sea otters allows researchers to develop effective capture, transportation, treatment and husbandry techniques. Rehabilitating animals often provides biomedical and physiological standards regarding exposure to pathogens, parasites and toxins.

Carefully planned and executed rehabilitation programs can advance our understanding of the basic biology of a species, and thus improve the scientific foundation for conservation programs. This may

serve as the only research option for species that do poorly in captivity or whose populations have declined to the point that disturbance by scientists would be detrimental. For example, the sea otter may provide clues about a variety of other endangered mustelids including semi-aquatic (i.e. Amazonian otters (Pteronura brasiliensis)) and terrestrial (i.e. black-footed ferret (Mustela nigripes)) species.

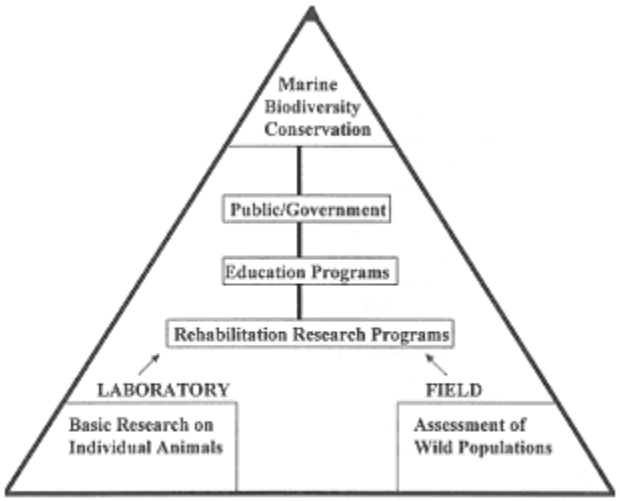
Individual otters as part of secure populations

Natural or anthropogenic factors may create habitats that are temporarily untenable for a species (Foose 1989). Captivity offers safe haven for preserving biodiversity until the environmental threat is removed. The sea otter and the California condor (Gymnogyps californianus) are good examples of such environmentally threatened species. Inadequate food resources, habitat loss and toxins have created an unsuitable environment for supporting the California condor (Verner 1978). To alleviate environmental pressures, the few remaining wild California condors were captured and placed in a captive breeding program. Likewise, pre-emptive capture and long-term holding may be the only alternative for the California sea otter in the event of a catastrophic oil spill (Degange et al. 1995; see Brennan and Houck, this issue). Such critical measures may be needed until habitats can be matched to the environmental requirements of the animals.

Individual otters as members of future wild populations

New methods and technologies for captive breeding and reintroductions to the wild offer a lifeline for endangered populations. When coordinated with habitat preservation, programs involving rehabilitated animals serve as a powerful tool for restoring communities and ecosystems (Stanley Price 1989). The black-footed ferret (Mustela nigripes) in Wyoming (Seal 1989), the Arabian oryx (Oryx leucoryx) in Oman (Stanley Price 1989) and the California condor in southern California (Verner 1978) are recent examples of scientific programs designed to "seed" the environment with wildlife from captive populations. Similar considerations should be given to the southern sea otter population. Hallmarks common to these programs were captive breeding and a comprehensive knowledge of the biology of the species. By guaranteeing the success of the individual, the programs were able to enhance population levels in the wild.

Figure 1. A theoretical Biodiversity Pyramid. Key elements in achieving conservation goals from rehabilitation programs are a foundation of research on individuals and populations followed by education of the public and government agencies.



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Turning rehabilitation into conservation‹the Biodiversity Pyramid

Conservation of biodiversity can be thought of as a pyramid, with knowledge as the base (see Figure 1). This foundation requires information about the needs of individual animals and the requirements of wild populations. It relies on basic research conducted on animals under human care as well as an assessment of the numbers and environmental challenges faced by animals in their native habitats. Research supported by rehabilitation programs and aquariums can provide the vital link between these research objectives. With planning, the result will be a direct application of research data to the conservation of wild populations. When linked to education programs, research findings can be used to shape public perception about conservation issues. Public empathy for the environment and animals can then translate into action by state, federal and international agencies. The cooperative goal should be to develop sound conservation measures for marine biodiversity based on scientific fact.

Admittedly, the challenge will be in the development of multi-disciplinary strategic plans for rehabilitation that incorporate research, education and conservation. The optimum conservation strategy for any species will incorporate captive and wild populations as interactive components (Foose 1989). Otherwise, rehabilitation programs will be limited to serving the emotional needs of the public rather than the species affected.

Literature Cited

Degange, R., B.E. Ballachey, and K. Bayha. 1995. Release strategies for rehabilitated sea otters. Pages 141-154 in T.M. Williams and R.W. Davis, editors. Emergency care and rehabilitation of sea otters. University of Alaska Press, Fairbanks, Alaska.

Estes, J.A. 1991. Catastrophes and conservation: lessons from sea otters and the Exxon Valdez oil spill. Science 254:1596.

Foose, T.J. 1989. Species survival plans: the role of captive propagation in conservation strategies. Pages 210-222 in U.S. Seal, E.T. Thorne, M.A. Bogan, and S.H. Anderson, editors. Conservation biology and the black-footed ferret. Yale University Press, New Haven, Connecticut. 302 pp.

Garrott, R.A., L.L. Eberhardt, and D. M. Burn. 1993. Mortality of sea otters in Prince Williams Sound following the Exxon Valdez oil spill. Marine Mammal Science 9(4):343-359.

Monnett, C., L.M. Rotterman, C. Stack, and C. Monson. 1990. Post-release monitoring of radio-instrumented sea otters in Prince William Sound. Pages 400-420 in K. Bayha and J. Kormendy, editors. Sea otter symposium: proceedings of a symposium to evaluate the response effort on behalf of sea otters after the T/V Exxon Valdez oil spill into Prince William Sound, Anchorage, Alaska. U.S. Fish and Wildlife Service Biological Report 90(12). 126 pp.

Ralls, K. and R.L. Brownell, Jr. 1989. Protected species-research permits and the value of basic research. BioScience 39(6): 394-396.

Seal, U.S. 1989. Conservation biology and the black-footed ferret. In U.S. Seal, E.T. Thorne, M.A. Bogan, and S.H. Anderson, editors. Yale University Press, New Haven, Connecticut. 302 pp.

Stanley Price, M.R. 1989. Animal reintroductions: the Arabian oryx in Oman. Cambridge University Press, Cambridge, United Kingdom. 291 pp.

Soulé, M.E., M. Gilpin, W.G. Conway, and J.T. Foose. 1986. The millennium ark: how long a voyage, how many staterooms, how many passengers? Zoo Biology 5:101-113.

U.S. Environmental Protection Agency. 1990. Reducing risk: setting priorities and strategies for environmental protection. Report of the Science Advisory Board: Relative Risk Reduction Strategies Committee. SAB-EC-90-021. 26 pp.

Verner, J. 1978. California condors: status of the recovery effort. General Technical Report PSW-28. Southwest Forest and Range Experimental Station., Forest Service, U.S. Department of Agriculture, Berkeley, California. 30 pp.

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