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## Protected Species – Research Permits and the Value of Basic Research

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## Roundtable

# Protected species—research permits and the value of basic research

The complexities involved in obtaining permits for field research using protected species continue to increase. In October 1988, Congress amended the Marine Mammal Protection Act (MMPA) to increase the documentation required to obtain a scientific research permit (PL 100-711). Applicants for scientific research permits must now submit "information indicating that the taking is required to further a bona fide scientific purpose and does not involve unnecessary duplication of research." Because increased difficulty in getting permits tends to discourage research on protected species, it may be to their disadvantage over the long term. The effective conservation of these species is dependent upon cumulative knowledge of their biology: knowledge gained through scientific research.

The need for active management of wildlife, including threatened and endangered species, is increasing as more of Earth is affected by human activities and as natural habitats shrink. Habitat preservation and a management strategy of benign neglect often will not suffice to preserve viable populations of a protected species. Unless actively managed, the habitat may change in ways not beneficial to these populations. Furthermore, many parks and reserves are becoming isolated islands of habitat and will gradually lose species according to the principles of island biogeography, unless this tendency is countered by human intervention (Brown 1986, Soulé et al. 1988). Frequently, effective human intervention is not possible without additional research.

Under the Endangered Species Act (ESA) and the MMPA, federal per-

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### Benefits of basic research are commonly underestimated

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mits are required to conduct most types of field research using threatened, endangered, and marine-mammal species. State and additional federal permits are often necessary as well. When applications for federal permits are reviewed, the probable costs and benefits of the proposed research to the protected species are important considerations. This approach is specified by the implementing regulations for the ESA and the MMPA. However, our experience has been that the potential benefits of basic research are commonly underestimated during the review process.

What are the true costs and benefits of research to a protected species? Costs include possible detrimental impact on the individuals and populations being studied and on their communities and ecosystems. Individuals may suffer disturbance, injury, or even death. If animals must be captured, drugged, or handled, some mortality is likely, no matter how careful researchers are. Population effects are of even greater concern. Is the research likely to decrease the growth rate of the population or increase the rate at which it is declining?

Research on one species also may have deleterious effects on other species or the communities and ecosystems, especially where groups of endangered species occur together in small patches of undisturbed habitat. For example, tiny 11-acre East Island, part of French Frigate Shoals in the northwest Hawaiian islands, is a major breeding ground for both the endangered Hawaiian monk seal and the endangered green sea turtle.

Therefore, any plan for research on one of these species should take into consideration effects on the other.

The benefits of research undertaken to answer a management question are usually easy to describe in a permit application. Such research is designed to contribute directly to the management and protection of the study species or its habitat. For example, research to estimate and monitor the size of an endangered or threatened population may determine the effectiveness of measures taken to prevent or reduce human-caused mortality or habitat destruction.

The management benefits of basic research, intended to gain knowledge about a species or to test scientific hypotheses, are much more difficult to anticipate and describe (Kuhn 1970, Medwar 1984). Although these benefits are often of the greatest long-term value, they are not predictable and may occur long after the research project is completed. As science historian T. S. Kuhn puts it, "New and unsuspected phenomena are . . . repeatedly uncovered by scientific research . . . history even suggests that the scientific enterprise has developed a uniquely powerful technique for producing surprises of this sort" (Kuhn 1970).

Like other forms of basic research, research on protected species tends to produce surprises, including unsuspected management problems. For example, basic research revealed that a scarcity of appropriate nest sites was largely responsible for the poor reproductive success of the endangered Puerto Rican parrot (Snyder 1978) and that endangered manatees in Florida were being killed by automatic flood-control gates (Odell and Reynolds 1979).

Sometimes the discoveries about the biology of the study species are immediately relevant to management concerns. For example, researchers using

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by Katherine Ralls and  
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radiotelemetry to study the movement patterns of threatened California sea otters found that juvenile males spend little time in the near-shore kelp beds where most sea otters remain. These young males are often so far off-shore that they cannot be seen from land. This behavior makes them vulnerable to human activities in those areas that would have little likelihood of affecting other parts of the population (Siniff and Ralls 1988).

Similarly, biologists studying the evolution of cooperative breeding in



Difficulty getting permits discourages valuable research on protected species, such as the California condor, California sea otter, and West Indian manatee. Photos courtesy (above) Jessie Grantham, National Audubon Society; (left) R. L. Brownell, Jr.; and (below) D. K. Odell and J. E. Reynolds.



the endangered red-cockaded woodpecker discovered that juvenile birds prefer to remain with their natal group and inherit an existing nest cavity rather than dispersing to unoccupied habitat and excavating a new cavity. This observation suggested that the number of existing nest cavities is a critical factor limiting population size and that reoccupation of vacant habitat might be improved by providing artificial nest cavities (Walters in press).

Not all newly recognized facts have immediate management implications. However, these discoveries contribute to the cumulative biological knowledge of a species, which provides a rich source of potential solutions to future management questions. When such knowledge is unavailable, the response to an urgent conservation need is usually met with an attempt to determine, by trial and error, what



will work. This approach wastes time and resources.

Although the exact benefits of basic research are impossible to anticipate, they should be given due weight by those preparing and reviewing applications for permits to conduct research on rare, endangered, threatened, and depleted populations and species. Proper consideration of these benefits would be facilitated by revising the implementing regulations for

the ESA and the MMPA to include as a criterion for granting scientific research permits a question such as "Is the research likely to increase basic biological knowledge about the population or species?"

The 1988 amendment to the MMPA may make it more difficult to conduct basic research on marine mammals. Although the amendment was intended to help ensure that marine mammal research will not have

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unnecessary undesirable effects, it could be implemented in such a way as to impair the freedom of scientists and retard the acquisition of knowledge needed for sound conservation strategies. Concerned scientists should pay close attention to the steps that the National Marine Fisheries Service and the Fish and Wildlife Service take this year to implement the amendment. Biologists should make their views known, so that implementation is not to the long-term detriment of either basic research or protected species.<sup>1</sup>

The permit application and review processes required of those seeking to conduct field research on protected species are already stringent. As with laboratory animal research (Kaplan 1988), adding even more layers of bureaucracy may easily do more to inhibit research than to protect species.

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<sup>1</sup>Write to Nancy Foster, Director, Office of Protected Resources, National Marine Fisheries Service, 1335 East-West Highway, Silver Spring, MD 20910 or Ralph O. Morgenweck, Assistant Director, Fish and Wildlife Enhancement, US Fish and Wildlife Service, Department of the Interior, 18th and C Streets, NW, Room 3024, Washington, DC 20240.

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