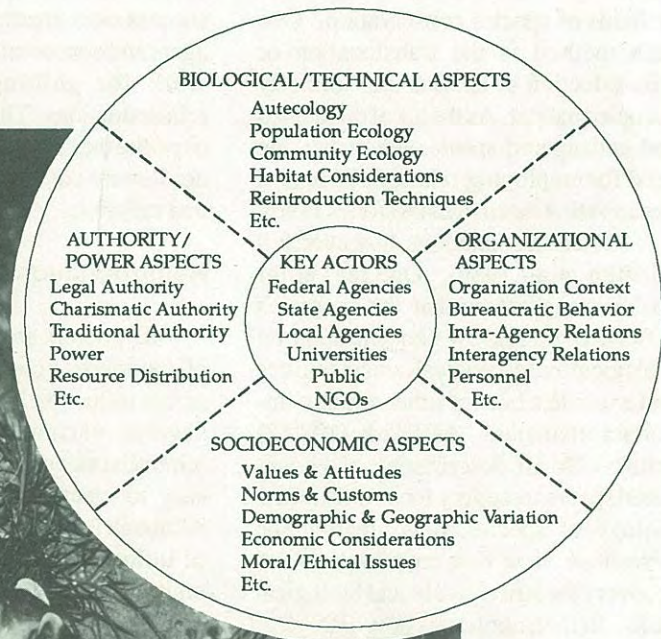
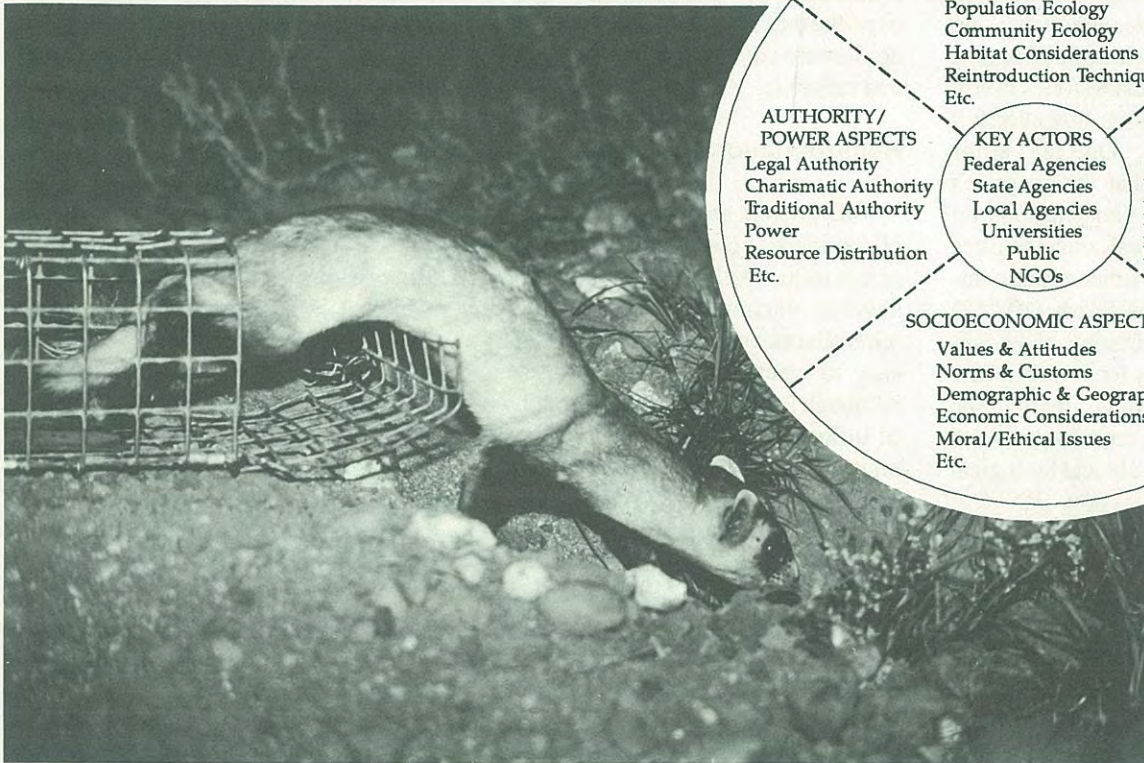


Endangered Species UPDATE

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Towards an Endangered Species Reintroduction Paradigm

by

Richard P. Reading, Tim W. Clark, and Stephen R. Kellert

Introduction

In response to the current extinction crisis, managers and conservationists are searching for innovative, more effective methods of species conservation. One such method is the translocation or reintroduction of species into formerly occupied habitat. As the list of threatened and endangered species lengthens, the need for employing reintroduction as a conservation tool increases (Jones 1990).

Most reintroductions, however, fail (Griffith et al. 1989). One reason for this, we suggest, is that the programs suffer from a narrow concentration on biological and ecological considerations and exclude a host of other equally important elements. As Clark (1989:3) stated: "Most descriptions of endangered species recovery focus only on the biology of species, thus creating the unrealistic view that conservation and recovery are strictly technical biological tasks. In fact, numerous non-biological factors and forces have direct, immediate and paramount significance to endangered species recovery, and if the conservation movement is to be effective, it must explicitly recognize the complexly interactive impacts and contributions of all the various dimensions."

Kellert (1985:528) also noted: "A compelling rationale and an effective strategy for protecting endangered species will require recognition that contemporary extinction problems are the result of socioeconomic and political forces." It has been our experience that these important elements often go unrecognized by most individuals working on endangered species reintroduction efforts.

To increase awareness and understanding of the importance of these elements, we are developing a systematic, more holistic approach to endangered species reintroduction which explicitly includes socioeconomic, organizational,

and political (power/authority) aspects, as well as biological sciences and technical aspects. A broadly applicable paradigm for the reintroduction of endangered species promises to enhance success rates greatly by providing managers and conservationists with a framework for guiding future species' reintroductions. The paradigm can both expedite the restoration process and render it more comprehensive, systematic, and rational.

Reintroduction Paradigm

Key actors are the focus, or center, of the model (cover photo). The key actors influence, and are influenced by, several variables associated with reintroductions. Key actors are usually easy to identify in specific programs. Although the variables form a continuum of influencing factors that affect each other in complex ways, we distinguish four variable classes; 1) biological/technical, 2) authority/power, 3) socio-economic, and 4) organizational (cover photo). These are briefly described below. Several variables important to species recovery were previously identified and discussed by Clark and Kellert (1988), Clark (1989), and Kellert and Clark (in Press).

Biological/Technical Aspects

Booth (1988:241) summed up part of the difficulty of restoring endangered species: "[A] continuing problem with reintroductions is that biologists must often contend with manipulating a dwindling species they do not fully understand. Wild animals in wild settings have a way of upsetting the best laid plans."

Reintroduction is often an uncertain, risky venture. Indeed, Griffith et al. (1989) found that most past reintroduction attempts failed, and

Kleiman (1989:152) suggested that "high costs, logistical difficulties, and the shortage of suitable habitats make reintroduction unfeasible as a conservation strategy for most rare and endangered species held in captivity." Nevertheless, several reintroductions occur each year and many more are planned. Of all the factors influencing endangered species reintroduction success, the biological and technical aspects are the most obvious and most often stressed (see almost any U.S. Fish and Wildlife Service Recovery Plan).

Plans must carefully consider prospects for the species' survival in the release area given the characteristics of the organism and the ecosystem with which it is associated (Griffith et al. 1989). Important considerations include autecology (e.g., life history characteristics, habitat requirements, scarcity), population ecology (e.g., demographics, genetics, dispersal), and community ecology (e.g., predator/prey relations, competition, biotic and abiotic interactions; Stanley-Price 1989, Kleiman 1989). Because of the rarity of most endangered species, pertinent information is often absent and not easily obtained (i.e., technical uncertainty). However, time is at a premium and conservationists must proceed in the face of uncertainty using the best available data.

In addition to ecological considerations, plans must address reintroduction techniques. Kleiman (1989) and Griffith et al. (1989) identify several important aspects of reintroduction techniques, including a well managed, self-sustaining source population, release site preparation, preparation and training of animals to be released, and demographic and genetic considerations in animal selection.

Getting the biology and technical considerations right is, in itself, a difficult and demanding job. Obtaining and

using this information at the right time and in the right way only compounds the species restoration challenge.

Authority/Power Aspects

In any situation where multiple actors are working toward a common goal, issues of authority and power arise and can potentially dominate the interactive process. Endangered species recovery programs are no different. For example, in the California condor (*Gymnogyps californianus*) case, Snyder and Snyder (1989:176) observed that: "The process of attempting to preserve this species has been as much a political as a biological endeavor and has involved endless polemics, confrontations, and debates, as well as endlessly shifting alliances, as old controversies have been resolved and new issues have arisen." Endangered species programs tend to be characterized by broad participation, high visibility, and large financial resources. In addition, the restrictive nature of the Endangered Species Act (ESA) often mobilizes libertarians, agricultural interests, natural resource extractors, and others fearful of losing traditional power or authority (Yaffee 1982, Reading and Kellert, In Prep.). The interplay of organizations, laws, traditional roles, and power differentials can result in power struggles and ideological conflicts, which can significantly limit the effectiveness of the overall program and in some instances potentially cripple the entire reintroduction effort (e.g., see Kohm 1990).

Authority relationships and power dynamics among key actors evolve as programs are carried out, although in many instances, traditional inter-organizational relations and preexisting laws, regulations, and mandates are set and strongly influence the development of inter-actor relationships. Weber (1968) recognizes three types of authority: 1) legal authority, in which legitimacy is based on formal laws, rules, and regulations; 2) traditional authority, wherein legitimacy rests with tradition, custom, or loyalty; and 3) charismatic authority, which finds legitimacy in devotion based on perceptions of exceptional qualities of leaders by their followers or subjects. Any restoration program can contain all

three kinds of authority, and their interactions can lead to unproductive conflict.

Resource distribution and power regimes are closely related to concepts of authority, and to each other. Resources include money, personnel, knowledge or expertise, land tenure, and, importantly, control of the animals to be reintroduced. In some programs, conflict centers on who has authority over the animals and the decision-making process surrounding the animals. Power both determines and is determined by the control of these resources and by authority (Lindblom 1980). Power maintained in the absence of legal authority often results in charismatic or traditional authority dominating a program, which, in turn, often evolves into legal authority.

For these and other reasons, local people, organizations and individuals staffing many restoration programs, are constantly vying for power and authority. Factors influencing the power structure and power relations of local communities and organizations include land tenure patterns, access to, and control over, resources, property relations, social stratification, and traditional authority (Clarke and McCool 1985, Kellert and Clark 1991).

Organizational Aspects

A major variable in the success or failure of a restoration effort is the kind of organizational system used. As Clark and Cragun (1991:1) concluded: "Understanding your organization and knowing how to make it work for species recovery can make the difference between a program that succeeds and one that fails." The organizational dimension is perhaps the least explicitly perceived and understood of the four variable classes by people involved in species restoration. This fact has profound implications for the kind of organizational system used to restore a species and its effectiveness, efficiency, and adequacy (see Clark et al. 1989).

Since several organizations often participate in endangered species recovery efforts, organizational considerations should be given explicit professional attention because they can affect the success of these programs. Understand-

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A forum for information exchange on endangered species issues
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Cover:

Black-footed ferret (*Mustela nigripes*) and a universe of reintroduction paradigm considerations.
Photo by Louise Richardson Forrest.

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ing organizations permits description, diagnosis, and prescription of situations and problems encountered within them (Gordon 1983). Even apparently technical problems may have unrecognized organizational bases because of the high uncertainty and wide decision-making latitude characteristic of endangered species recovery programs (Yaffee 1982, Clark 1989). The inability of the black-footed ferret (*Mustela nigripes*) recovery program to maintain a wild population of ferrets was at least partially attributable to organizational failures (see Clark and Westrum 1987, Clark et al. 1989).

An organization, especially a government-dominated bureaucracy has several dimensions. First, there is the context of the organization, including its internal and external environments, its structure, its culture, its goal orientation, and the characteristics of its personnel. The internal environment is shaped by several factors, including specialization and interdependence, competition and conflict, status equalization, and over staffing (Warwick 1975). Factors shaping an organization's external environment include complexity, uncertainty, threat, dispersion, diversity, and change (Warwick 1975, Gordon 1983). An organization's culture and its goal orientation are derived from philosophies, legislation, policies, and the kind of professionals it has as staff (Byars 1984).

Second, and closely related to organization context, are variables associated with bureaucratic behavior. These include policy formation and implementation, managerial orthodoxy or obedience, standard operating procedures (SOPs), degree of organizational conservativeness, and constituency/public relations (Yaffee 1982, Gordon 1983). Within agencies, formal policies are often significantly altered by substantial discretion in implementation and administration, which exists because policymakers lack the technical knowledge to specify implementation policies (Lindblom 1980, Yaffee 1982). Finally, organizations are sensitive to external pressures from controllers, clientele groups, constituencies, allies, and adversaries (Yaffee 1982, Warwick 1975). This is why restoration programs rapidly bureaucratize even to the point of stifling

creativity and problem solving (see Clark and Westrum 1987).

The last category of organizational variables is inter- and intra-agency relations. Agency relations often deal with the authority and power issues discussed above, but difficulties may also arise from differences in the organization characteristics mentioned above. In addition, organizations often struggle for control of communication (Weinstein 1984).

The kind of organization that dominates nearly all endangered species restoration efforts is conservative, government bureaucracies with fixed SOPs. In some cases, power differentials and states' rights vs federalism ideology can come to dominate the kinds and frequency of interactions among the program's organizational actors (Ernst 1990). In turn, this has major implications for the actual work of restoring the endangered species.

Socioeconomic Aspects

The socioeconomic context of the endangered species reintroduction effort is critical to the performance of the program. For example, Tilt (1989:38) observed that: "The general public's perception of an endangered species issue may not seem important to a wolf lover or a darter supporter. But if the general perception runs against an animal or plant's continued survival, all the biological data in the world will be useless against the perception."

A systematic examination of socioeconomic aspects is necessary to understand the values, attitudes, and perceptions held by people involved with, and potentially influenced by, endangered species reintroductions. Such considerations are usually lacking or insufficient in endangered species management efforts (Kellert 1985).

Local support is crucial. The experimental reintroduction of eastern timber wolves (*Canis lupes lycaen*) into the Upper Peninsula of Michigan during the mid-1970s illustrates this. All four wolves were killed within 8 months of being released. Hook and Robinson (1982:382) examined local attitudes following the release and suggested that "the wolf's future in Michigan depends

upon the attitudes of Michigan residents toward this animal." Assessing public views and knowledge of wildlife permits program managers to design pertinent and effective public relations campaigns to develop support and to enable people to make more rational and intelligent decisions (Kellert and Berry 1980, Reading and Kellert, in Prep.).

A number of factors influence people's attitudes and values towards wildlife, including many characteristics of the species (e.g., phylogeny, morphology, size, sentient capacity), the perceived worth of the animal, and its symbolic nature (Kellert and Berry 1980). It is far easier to garner support for species with high public appeal (i.e., the 'charismatic megafauna') than for lesser known and so-called 'lower' life forms (Westman 1990). Values of wildlife and attitudes toward wildlife are strongly influenced by the perceived economic or material worth of the animal. These include aesthetic, ethical, ecological, biological, recreational, cultural, utilitarian, genetic, and unknown or undiscovered values (Ehrenfeld 1976, Ehrlich et al. 1977, Rolston 1981, Kellert 1987). The perceived worth of a species is, in turn, often based on knowledge of the species, moral and ethical issues (i.e., animal rights), and traditional market values (i.e., pelt values). Local norms and customs can also play a strong role in shaping attitudes and values, especially in the absence of accurate knowledge. Variations in norms and customs often follow demographic and geographic patterns.

Values and attitudes towards endangered species in general, the ESA, and endangered species recovery programs are also important. Threatened or endangered status elicits fear and hostility among certain sectors of society (e.g., agricultural interests) and compassion and support among others (e.g., members of conservation organizations; Reading and Kellert, in Prep.). Negative attitudes are often based on real and perceived fears of the restrictive components of the ESA which many people view as a threat to their livelihoods and lifestyles, on negative attitudes toward wildlife, and on the affects of past recovery programs (Reading and Kellert,

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in Prep.). Positive attitudes are often rooted in recognition of, and concern for, the loss of biodiversity and positive attitudes toward wildlife (Kellert 1985).

Finally, there are economic aspects. In spite of their importance, most of the values of species conservation are difficult to quantify and therefore often ignored. Costs associated with reintroduction, however, are more easily ascertained and more often stressed. Bishop (1978) stresses the irreversibility of extinction and its implications in terms of unknown future losses. He suggests that society should avoid extinction unless the costs of maintaining viable populations are unacceptably large.

Conclusions

As reintroductions become more important in endangered species conservation and management, the need for more systematic, holistic reintroduction efforts grows. Such efforts should address the socioeconomic, political, and organizational aspects of species reintroductions more comprehensively, rather than focusing strictly on biology, as is currently the case. All the variables discussed above affect the success of reintroduction programs. Incorporation of these variables into reintroduction efforts promises to minimize problems, barriers, and conflicts, and enables the program to draw upon the constructive expertise of each key actor involved. It is crucial that reintroduction plans address these aspects to ensure orientation of all the actors toward successful reintroduction and rapid, efficient movement toward that goal.

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Author affiliations are as follows:
Richard P. Reading is a PhD Candidate studying wildlife ecology at Yale University, 205 Prospect St., New Haven, CT 06511 and Research Associate at the Northern Rockies Conservation Cooperative, Box 2705, Jackson, WY 83001, USA. Tim W. Clark is President of the Northern Rockies Conservation Cooperative and Adjunct Professor at the Yale School of Forestry and Environmental Studies, New Haven, CT 06511, USA. Stephen R. Kellert is Professor at the Yale School of Forestry and Environmental Studies, New Haven, CT 06511, USA.