*Essays*

# Formation of Social Acceptability Judgments and Their Implications for Management of Rare and Little-Known Species

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**Abstract:** *Effective policies for management of rare and little-known species (RLKS) must be not only scientifically valid and cost-effective but also consistent with prevailing social beliefs and values. Limited public awareness of RLKS, however, constrains efforts to frame such policies. Lacking public support, resistance to RLKS programs is likely, particularly when other uses and values are affected. The challenge lies in understanding how public judgments are formed, sustained, and altered. Although the lack of public support often is attributed to inadequate understanding of the scientific bases for policies, research indicates that judgments derive from a complex, albeit poorly understood, suite of factors, including context, trust, esthetics, and personal history. Steps that can enhance public understanding of RLKS management include (1) clarifying the rationale and impacts of policies on the species, (2) specifying the contextual setting, (3) outlining specific actions to be taken, and (4) identifying when and where policies will be employed. Failure to foster understanding and support will leave management dominated by conflict and continued species loss.*

**Key Words:** decision making, policy processes, public involvement

Generación de Juicios de Aceptabilidad Social y Sus Implicaciones para la Gestión de Especies Raras y Poco Conocidas

**Resumen:** *Las políticas efectivas para la gestión de especies raras y poco conocidas (ERPC) no solo deben ser válidas y rentables científicamente, sino consistentes con las creencias y los valores sociales prevalecientes. Sin embargo, la limitada percepción pública de las ERPC inhibe los esfuerzos para enmarcar tales políticas. Sin soporte público, es probable la resistencia a programas ERPC, particularmente cuando otros usos y valores son afectados. El reto consiste en entender como se forman, sustentan y alteran los juicios públicos. Aunque la falta de soporte público a menudo es atribuida al entendimiento inadecuado de las bases científicas de las políticas, la investigación indica que los juicios se derivan de un complejo conjunto, poco comprendido, de factores que incluyen el contexto, la estética y la historia personal. Los pasos que pueden enriquecer el entendimiento público de la gestión de ERPC incluyen (1) clarificar el fundamento e impacto de las políticas sobre la especie, (2) especificar el escenario contextual, (3) delinear acciones específicas y (4) identificar cuando y donde se aplicarán las políticas. El fracaso del fomento de entendimiento y soporte hará que la gestión esté dominada por conflictos y la pérdida de especies.*

**Palabras Clave:** participación pública, procesos políticos, toma de decisiones

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## Introduction

During a debate about the future of the U.S. Endangered Species Act, former Secretary of the Interior Bruce Babbitt stated, "We can't get re-authorization...by emphasizing snakes" (Herring 2001:200). His comment acknowledges that the images associated with resource policies can affect public perceptions and the potential for successful implementation. For example, in the Pacific Northwest, arguments for protection of old-growth habitat often are accompanied by photos of the Northern Spotted Owl (*Strix occidentalis*). Species possessing appealing anthropomorphic qualities (wise, cute) become agents for mobilizing public awareness and political action.

Successful species conservation policies must satisfy three criteria: biologically possible (grounded in sound ecological understanding), economically feasible (monetary and nonmonetary benefits exceed costs), and culturally adoptable (consistent with prevailing norms and beliefs) (Firey 1960). Although the first two criteria have attracted extensive research, few studies have focused on the processes that foster cultural adoptability, or as commonly termed, social acceptability. Yet, regardless of analytical rigor, effective policy implementation derives from the interactions among competing interests, motives, and a host of formal and informal institutions (Walker et al. 2002). Similarly, "conservation policies and practices are inherently social phenomena, as are the intended and unintended changes in human behavior they induce" (Mascia et al. 2003:649).

Building public support for management of appealing species such as owls or charismatic megafauna such as wolves is one thing. Unique challenges face those concerned with species that often lie under the radar of public awareness and interest (e.g., slugs and fungi). Here, we explored the implications of social acceptability for management of rare and little-known species (RLKS). Our policy focus is bounded by the processes and structures of U.S. governance, but the underlying issue is transnational in scope. We begin with RLKS and the challenges facing efforts to build and sustain public support for them in North America and globally. We define *social acceptability* and discuss why it merits attention in efforts to enhance RLKS management. We outline the factors and dynamics that affect formation of acceptability judgments. Finally, we outline specific steps for resolving the challenges facing RLKS managers, grounded in a contemporary understanding of the judgment process.

### Rare and Little-Known Species Management

Although RLKS lack a precise definition, they include those with a small population and for which limited understanding of their function and of the nature of needed management interventions exists. For example, the California Condor (*Gymnogyps californianus*) is rare, but a significant body of knowledge regarding its biology exists. Other species (e.g., fungi and lichen) are both rare and poorly understood. Collectively, RLKS might account for the majority of the world's species (Wilson 1987). Yet the qualities of rare and little known mean they often hold little salience among policy makers or the general public. Although policies addressing the needs of these species can be controversial, a recent review (Shindler et al. 2002) reports that no studies have focused on the social acceptability of RLKS management programs. Lack of attention to social acceptability might underlie, in part, why controversy can arise.

The literature on social acceptability and natural resource management focuses predominantly on issues of significant public and policy salience (e.g., fire, forest management) or on species that evoke human emotion and concern (e.g., Spotted Owl, wolves). Nonetheless, it provides important insights into the social acceptability process for RLKS managers. Whether managing for the reintroduction of wolves or nitrogen-fixing lichens, there is a common set of questions relative to management interventions and how such interventions affect other uses and values. How would interventions—silvicultural treatments, manipulation of fire regimes, or implementation of habitat restoration programs to protect RLKS—affect commodity, subsistence, or amenity uses and values? What specific benefits flow from such interventions and who receives them? Conversely, what are the costs and who bears them? What factors shape public views as to the acceptability of such actions? Addressing such questions is critical to framing effective RLKS conservation policies.

### Social Acceptability

Social acceptability has multidisciplinary roots, including economics, mathematics, and social and cognitive psychology. In the context of natural resource management, however, social acceptability and its role in decision making lack an agreed-upon definition. As a consequence, a variety of terms have emerged describing public views of resource management, including *preferred*, *appropriate*, and *tolerable*. In an effort to clarify terminology, Brunson (1996:9) proposed the following definition of *acceptability*: "A condition that results from a judgmental process by which individuals (1) incorporate the perceived reality with its known alternatives; and (2) decide whether the 'real' condition is superior, or sufficiently similar, to the most favorable alternative condition."

This definition highlights key aspects of social acceptability: it is a judgmental process involving comparisons of known alternatives, it implies judgments are influenced by a suite of factors, and it has a behavioral component that reveals itself at multiple levels. The idea of a judgment implies an assessment, estimation, and inference about

the occurrence of events and the relation of outcomes to these events (Hastie 2001).

Although the definition focuses on how individuals make judgments, the adjective *social* implies that what matters is some aggregation of individual judgments. Such aggregated measures can range from an informal consensus among participants at a public meeting to formal, codified expressions (e.g., laws).

There are five reasons why judgments, irrespective of their level of acceptance, are important to RLKS management. First, if decisions regarding RLKS fail to address pressing public concerns, successful implementation is unlikely, irrespective of scientific rigor. Although basing decisions on the best science is important, public judgments regarding the acceptability of species conservation programs are informed by a variety of factors other than science, including personal experience (Friedmann 1987), ethical concerns (Callicott 1989), and trust in individuals and institutions (Moore 1995).

Second, accommodating public concerns in decision making is a principle of U.S. governance (i.e., the public has a right of access to decisions that affect them). The principle is embodied in U.S. environmental legislation (e.g., National Environmental Policy Act), and generally it is accepted that "public participation is. . .an essential part of sound and legitimate political decision-making" (Hisschemöller & Midden 1999:18). At the same time, there is a tension between this normative principle and technically complex policy issues such as RLKS management. Pierce et al. (1992:14) describe this tension as the quandary facing society: "[H]ow can the democratic idea of public control be made consistent with the realities of a society dominated by technically complex policy questions?" Acting to support well-grounded judgments of social acceptability regarding RLKS management and incorporating them into decisions is an effort to address this quandary.

Third, resource management institutions—management organizations, policies, or programs (such as RLKS management)—require public understanding and support to survive. In the U.S. political system, the body politic holds ultimate veto power over such institutions (Friedmann 1987). The authorities held by a public management agency derive from the political power held by society and delegated through the political process. When agency behavior is perceived (accurately or not) as inconsistent with public values and concerns, an agency's ability to act effectively is compromised. Extreme unresponsiveness to public concerns can foreshadow demise of the program or agency (Clarke & McCool 1996). In the case of RLKS, a failure to cultivate public understanding and support will compromise their future.

Fourth, acceptability judgments imply a need for action (Lee 1993). If a situation is judged acceptable, what is required to maintain it? If a situation is unacceptable, what is required to improve it? For example, to protect an RLKS, it might be necessary to initiate silvicultural interventions or to prohibit human use in an area. In either case, such decisions have implications for what should be done, when, at what costs, by whom, and with what impacts on other uses and values (e.g., benefits gained, opportunities foregone). Such questions involve social choices, making assessment of social acceptability a critical element (Rayner & Malone 1998) in decision making.

Fifth, although social acceptability might be seen as constraining efficient and effective incorporation of science in decision making, the pursuit of social acceptability also offers an opportunity to inform and educate stakeholders in the complexities of RLKS management, promoting mutual learning (Michael 1995) and the search for innovative management solutions. Learning about alternatives, the values and concerns of others, the scientific bases for proposed actions, their benefits and costs, and risks and uncertainties are important steps in species management. Shared interests among diverse stakeholders in avoiding regulatory solutions have fostered cooperative efforts in the management of rare species such as the Coachella Valley fringe-toed lizard (*Uma inornata*) (Wondolleck & Yaffee 2000). Such activities take time, but they are necessary to ensure that science appropriately informs decisions regarding RLKS.

Despite arguments advocating incorporation of public acceptance in fashioning effective RLKS policies, today's complex social context presents challenges. The most basic resides in the rareness of these species and how this affects efforts to foster social acceptability. On one hand, many citizens regard the loss of natural heritage troubling. Steel and Lovrich (1997) report that 90% of those surveyed agreed that humans have an ethical obligation to protect plant and animal species, and 50% described species loss as "very serious." Such concerns imply a political and economic willingness to support RLKS programs. Although species protection in the abstract resonates with many, often support is underlain by little understanding of its consequences, impacts, and alternatives. Moreover, the social benefits of RLKS can be difficult to specify precisely and often are depicted only vaguely (e.g., possible sources of new medicines). There is also an asymmetry in the flow of benefits and costs of species protection. Potential human benefits are seen as accruing across society or to future generations. Costs, on the other hand, appear quickly, often borne disproportionately by local populations dependent on the same resources on which RLKS depend. Although this is not an argument against protective measures, the associated equity issues influence acceptability.

Rareness also contributes to a lack of salience and social relevance, compromising efforts to build public support. Programs for RLKS must compete with an array of social (health, education) and environmental priorities. The low public salience associated with RLKS protection, including an awareness of purposes and benefits and

the consequences of a failure to protect them, makes it difficult to mobilize support. Wilderness advocates were reminded of this in 1963 when they attempted to mobilize opposition to flooding Glen Canyon on the Colorado River. Their efforts failed, Nash (1982) concluded, because of public apathy. Because the area lacked official designation and its values generally were unknown, building public support for its protection proved futile. Similarly, those responsible for RLKS must be mindful of the importance of public awareness in gaining support and understanding for their conservation.

Various arguments underlie why social acceptability judgments are critical elements of decision making regarding RLKS management. Although institutional barriers and organizational culture can limit consideration of such judgments in decision-making processes, ignoring them is neither practical nor feasible (Clarke & McCool 1996). A more pressing matter is how to improve the basis on which judgments take form. To achieve this requires understanding the factors, and interactions among them, that shape, sustain, and alter judgments.

### Factors That Shape, Sustain, and Alter Public Acceptability Judgments

The multidisciplinary roots of a social-acceptability concept mean that various approaches exist for its study (e.g., interest politics, decision theory). Contemporary investigations of the acceptability judgment process, however, have relied primarily on belief-attitude-behavior models of social psychology (Brunson & Shindler 2004). These models focus on the relationships among beliefs, attitudes, and behavior (Ajzen & Fishbein 1980; Eagly & Chaiken 1993) and have been applied to wolf reintroduction (Pate et al. 1996), ecological restoration (Bright et al. 2002), and wildland fuels management (Brunson & Shindler 2004). These studies share a structure framed around the interactions among cognitive (knowledge, information) and affective (emotional, aesthetic) beliefs about the object of concern, mediated by value orientations and normative influences. These interactions yield judgments regarding the acceptability of a practice and are considered along with information regarding the policy's scientific soundness and economic feasibility.

The judgment-formation process—for citizens, scientists, or policy makers—involves a suite of cognitive, affective, and contextual beliefs (Fig. 1). At their foundation, judgments are shaped by the underlying value system held by an individual. Moreover, the judgment process is dynamic, and judgments are always provisional: as new information emerges or context changes, judgments can similarly change. Species conservation issues arise from various drivers such as new scientific knowledge, statutory imperatives (e.g., Endangered Species Act), or public concerns. In developing appropriate policies, scientific knowledge helps define the biophysical possibilities for what can and should be done (e.g., in developing a Habitat Conservation Plan for the Red Hills salamander (*Phaeognathus hubrichti*), International Paper relied on the knowledge of independent scientists to fashion a credible, sound plan) (Wondolleck & Yaffee 2000). Such knowledge and its policy implications, however, are interpreted and evaluated through various contextual and normative lenses. These include personal experience and knowledge (Friedmann 1987), ethical concerns (Callicott 1989), trust and confidence in individuals and institutions (Wondolleck & Yaffee 2000), contextual circumstances (Shindler 2000), attitudes and beliefs (Ajzen & Fishbein 1980), and perceptions of acceptable risk (Renn 1992). For example, fundamental beliefs as to what constitutes reliable, relevant knowledge determine what constitutes sufficient evidence (does it derive from systematic experimentation with controls and replication or is it based on personal experience and observations?). For many, knowledge divorced from actual experience holds little credence; for others, local knowledge is merely anecdotal.

Although acknowledging the lack of empirical work regarding the social acceptability of specific RLKS management programs, a diverse, interdisciplinary literature in natural resources has emerged describing the factors that drive the judgment formation process (Shindler et al. 2002). In the following, we link the conclusions of this literature to the specific endeavor of RLKS management.

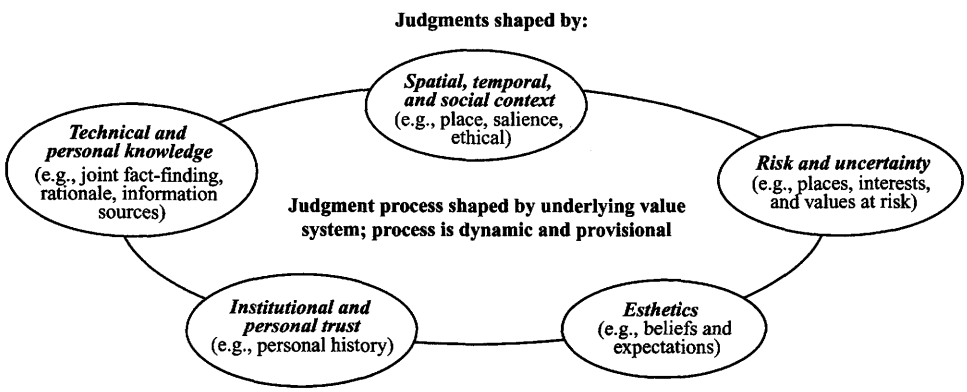


*Figure 1. Relationship, structure, and dynamics of the social-acceptability judgment process in policy implementation.*

#### TECHNICAL AND PERSONAL KNOWLEDGE

Typically, scientific knowledge of species, processes, and functions is regarded as the foundation of sound management policy. Indeed, a frustration for many policy makers, in response to public opposition, is the public's lack of knowledge (Wondolleck 1988). Confusing the provision of facts and detail with building public understanding and support is a mistake, however. Sound information is necessary to building and supporting sound decisions but is insufficient by itself to ensure such a result (Hisschemöller & Midden 1999).

Despite efforts to expand public outreach through meetings or field trips, information flow remains largely unidirectional. That is, informed experts provide uninformed citizens with the technical knowledge presumed necessary to understand and support a policy (Friedmann 1987). The approach is grounded in an assumption that it is the lack of factual understanding that accounts for opposition, a problem remedied by increased knowledge provision (Wondolleck 1988).

Unfortunately, this view is flawed in terms of how it is defined and how it is to be resolved. For example, public responses to policies often derive from knowledge gained from personal experiences. This does not mean scientific input is disregarded, but it suggests that how, why, and by whom information is presented are crucial. Species conservation practices are more likely to gain public acceptance when the rationale is clear (Yaffee & Wondolleck 1997) and citizens have been genuinely engaged in the planning process, trust the information source (Moore 1995), and have an opportunity to consider the outcomes of the practice. In sum, people have a clear sense of why the species conservation policy is needed, they have an opportunity to be engaged in the debate about those policies and believe their knowledge has received respectful and legitimate consideration, they hold a fundamental sense of trust for the managers and scientists with whom they are engaged, and they have a sense of how implementation will affect uses and values important to them. Such attributes are core requirements of any effective decision-making process (Yankelovich 1991).

Social acceptability, however, is a function of knowledge and understanding. In studying citizen involvement in watershed management, Wright and Shindler (2001) found that although most respondents expressed interest in the issue, few were well informed regarding technical aspects. Respondents had high trust in information providers, and this trust was associated with the perception that the information provided was useful. The implications of these findings for those engaged in framing effective species conservation policies are clear: what people know and believe to be important (the cognitive dimension) and how people feel about the information, the providers, and the processes used to communicate information (the affective dimension) are both important (Ajzen & Fishbein 1980). Such conclusions are particularly important in RLKS management, given the low levels of public awareness and salience.

#### SPATIAL, TEMPORAL, AND SOCIAL CONTEXT

Context posits that what is acceptable in one situation will not necessarily be so in another, even when problems are similar. Each situation involves a unique relationship between people and the environment. For example, spatial context requires consideration of biophysical (place) and social concerns (relevance). Because citizen interests and concerns typically lie at specific, local scale places that hold meaning for them, they can find it difficult to identify with policies such as prescribed fire initiated at the landscape level to achieve species conservation (Stankey & Shindler 1997). Temporal context is even more problematic, with citizens challenged to understand complex ecological processes (e.g., natural disturbance, succession) and evaluate long-term management (Shindler 2000). As with spatial context, action taken for species conservation purposes for which the long-term consequences are not apparent or are uncertain can face public resistance.

Spatial scale underlies NIMBY (not in my backyard) arguments. Although such arguments often are treated as selfish, they can reflect a fundamental dissatisfaction with decision-making processes judged unresponsive to local concerns. They also can reveal place attachments that hold meaning to citizens and affect how people define appropriate actions in those places (Williams & Patterson 1996). Treating a forest merely as a collection of trees ignores its contextual relevance to people. The site specificity required for effective RLKS management also facilitates a connection between the biological and social importance of place. Despite their appeal in landscape planning, an inherent weakness of many coarse-filter models is that they fail to provide the specificity that more fine-grained models, adapted to local conditions, offer (Bawa et al. 2004).

#### INSTITUTIONAL AND PERSONAL TRUST

Social acceptability judgments evolve from relationships among individuals and between individuals and organizations. These relationships can have profound effects on trust among the various players. Moore (1995) notes that individual trust derives from attributes such as honesty and reciprocity, whereas organizational trust arises from a belief that decision processes are open and fair. Confounding the problem is that different stakeholders place greater trust in different parties in a controversy. Shindler (2003) reported that although many citizens trust local resource managers, they were skeptical of the larger organization's motives or its willingness to delegate flexibility and discretion. Although the benefits of trust are

generally understood, an ability to create and sustain it is less apparent (Kramer 1999).

The inherent qualities of RLKS management (e.g., low public salience and political relevance, high levels of uncertainty about benefits and costs) make trust a critical issue. When these qualities are combined with a lack of trust in RLKS practitioners, progress becomes highly problematic. When trust prevails, the capacity to operate effectively even in the face of these qualities is still possible.

#### ESTHETICS

Public dissent at times appears concerned only with appearance. For example, proposals to reintroduce fire or the use of silvicultural practices to restore habitat might be opposed on the grounds that such actions are unsightly. If these conditions affect places of importance to people, however—a scenic view, a favorite recreation site—the resulting esthetic impacts become significant considerations in framing judgments regarding their acceptability (Ribe 2002). The perception of adverse esthetic impacts can be symptomatic of more serious underlying problems such as the belief that if it looks bad, it cannot be ecologically sound. Esthetic critiques also can presage other public concerns. For example, although local criticism of clearcutting on Montana's Bitterroot National Forest was triggered initially by the esthetic impacts of terracing, these criticisms broadened to include a range of complex issues such as soil erosion vulnerability and impacts on long-term site productivity (University of Montana Select Committee 1970). Ultimately, these criticisms led to substantive reform in American forest management legislation, in the form of the Resources Planning Act of 1974 and the National Forest Management Act of 1976. As suggested earlier, failure to attend to the concerns raised in the social acceptability process can translate into statutory strictures that fundamentally change resource management practices. The reality for RLKS practitioners is that esthetic-based concerns involve far more than whether "things are pretty or ugly"; they can represent evidence of other, more dire consequences and, perhaps more damaging, a lack of concern on the part of managers and scientists (Ribe 2002).

#### RISK AND UNCERTAINTY

Social acceptability judgments always are undertaken against the perceived risks and uncertainties as understood by those making the judgments (Wildavsky 1988). For any action to protect or restore an RLKS, public acceptance is measured by the extent to which that action is perceived to place other salient concerns at risk.

Different parties focus on different aspects of risks associated with RLKS policies. Among RLKS specialists and scientists, concerns focus on the risks involved in not proactively managing for such species, given their role in ensuring healthy ecosystem functions and processes. Despite generalized public support for species protection, when specific proposals are introduced, public apprehensions will emerge, related to impacts on important recreation places (e.g., use limitations), on the source of livelihood (e.g., prohibitions on timber harvesting to ensure essential habitat), or on the fear of a taking of private land for species protection (e.g., loss of development rights to protect the desert tortoise (*Gopherus agassizii*) in southern Nevada [Wondolleck & Yaffee 2000]). Politicians focus on the political risks associated with policies and their respective stances on them. For citizens and politicians alike, however, one feature is essential: both want to know what and where actions will be taken and how serious, how certain, and how soon the consequences of risk will be (Shindler et al. 2002). Yet the underlying rareness of RLKS can limit the ability of specialists to identify specific outcomes associated with proposed actions.

Although risk is familiar to scientists, for policy makers it is something to be avoided. The U.S. institutional environment—management organizations and procedures, policies, laws—is dominated by risk aversion (Lee 1993). Although often used as a pejorative, risk aversion simply means attempting to prevent harm from occurring (Wildavsky 1988). The dilemma facing managers and scientists concerned with RLKS is that the ability to prevent harm is constrained by a lack of understanding of the source of harm. Human interventions (e.g., silvicultural prescriptions) might be resisted on the grounds that such actions caused the problem in the first place. Wildavsky (1988) contends that the most effective strategy for reducing uncertainty involves trial-and-error experimentation. In short, to overcome uncertainty, risks must be taken. In risk-averse environments, however, this is not easy and resistance can come from politicians, policy makers, regulatory agencies, managers, or scientists (Stankey et al. 2003*b*).

Three conclusions emerge from our framework. First, although we have a general understanding of the judgment process and the key formative factors such as trust and risk, the dynamics among these components are poorly understood. Second, because judgments derive from multiple influences, they tend to resist change. For example, enhancing scientific knowledge regarding RLKS will have a limited effect on public judgments regarding their management if trust or context is ignored (Shindler et al. 2002). Third, judgments are always provisional; new scientific knowledge emerges, the contextual environment changes, new laws are created, political salience shifts (Stankey et al. 2003*a*). We close by identifying some specific roles and actions specialists might consider in efforts to mobilize public understanding and support for RLKS policies in light of this dynamic process.

**Challenges and Possible Responses**

First, and fundamentally, RLKS specialists—policy makers, managers, scientists, and other practitioners—must acknowledge acceptability judgments as an essential element of democratic decision making. Although the importance of these judgments is recognized by some (Mascia et al. 2003; Thornhill 2003), skepticism still remains. We believe acceptability judgments should be viewed not as barriers but as opportunities to fashion programs ensuring informed public access to decision processes and to build ecological literacy (Orr 1992). In this way, ecologists take on the role of teachers, emphasizing interactive communication and collective discovery (Carpenter & Gunderson 2001). Such interactions provide specialists opportunities for monitoring local human activities regarding use and impacts on RLKS and for feedback on public attitudes regarding their protection (Molina et al. 1997).

This provides opportunities to communicate learning to various publics and to learn from them. Often extensive personal or experiential knowledge is held by citizens who have lived and worked in places where RLKS are found, and they possess important understanding of species' occurrence, numbers, and trends that can inform and augment technical knowledge held by specialists (Buck et al. 2001). Seeking out such knowledge improves the stock of information about these species and serves as an effective means of building community support and understanding for species conservation (Fischer 2000).

Second, RLKS management will always compete for scarce resources with a host of other social priorities such as health and education. The challenge that specialists must address more effectively is how to increase the saliency of RLKS management in this competitive political environment. This could involve efforts to focus attention on the multiple values—utilitarian, scientific, moral—that benefit society through species protection. Another opportunity is to link species protection with other sectoral concerns such as the role of healthy ecosystems as a foundation to a healthy economy or as an element of comprehensive education (Orr 1992). This acknowledges the multiple formative factors revealed in our framework and recognizes that successful public policies must accommodate these diverse factors.

Third, public attitudes and behavior with regard to the acceptability of species conservation policies are tied to the specificity with which a policy is presented. For example, national polls suggest that, in the abstract, people support protection of biodiversity and endangered species. If, however, a policy is proposed that involves closing a favorite scenic destination to protect habitat of RLKS, the situational context within which judgments are framed changes dramatically. Zinn et al. (1998) identify five questions that help clarify how this contextual specificity shifts: (1) What target is involved (the species)? (2) What issue drives the action? (3) What actions are proposed? (4) What time factor is involved (when will it happen and for how long)? and (5) Where it will occur? By increasing specificity in these terms, the likelihood of improving public understanding of a policy can be increased. Although specificity can mobilize opposition as it becomes apparent where actions are contemplated and their associated impacts, such specificity should not be seen as creating opposition where once it did not exist. Such latent stances are inevitably present and are certain to become overt once implementation occurs. By being open and explicit about the specifics before implementation, the opportunity is available for discussion, informed debate, and learning. Through such processes the possibility of building acceptability in addition to support exists.

Fourth, our framework emphasizes that social acceptability judgments regarding RLKS are shaped by a complex, dynamic set of formative factors, not just increased scientific knowledge. Building and sustaining acceptability of species management programs depends on acceptance of the legitimacy and relevancy of these other factors (Shindler et al. 2002). This does not diminish the importance of scientific understanding. Ironically, however, attempts to ignore or discount public judgments could undermine consideration of science in political settings, where decisions occur (Jasanoff 1990).

Our framework represents a map depicting where RLKS specialists have the opportunity to influence the judgment process. At its root, specialists are the key source of technical knowledge on which policy is founded. In the complex, contentious social and political environment in which public interpretations are formed, specialists and their knowledge become only one source of influence on those judgments. Even here, however, specialists have a role to play relative to other mediating factors that influence public judgments. For example, they can validate personal knowledge held by people who have lived and worked on the land. Conversely, such experiential knowledge can be the source of insights from which specialists benefit (e.g., new information regarding species distribution and prevalence; Wondolleck & Yaffee 2000). Specialists can clarify options for RLKS management that are sensitive to the contextual concerns of citizens. Where other important values and uses exist, are there opportunities for creative management that both protect key species and minimize adverse impacts on other values? Creative management might include such things as seasonal closures, temporary prohibitions on human uses, and selective restrictions on human activity. When more onerous management actions are required, specialists must work to build understanding regarding the rationale for those actions and how they contribute to conditions generally taken as socially desirable.

Fifth, building social acceptability requires commitments of time, money, and thought; even when such commitments are made and produce supportive judgments, however, the challenge of sustaining support continues. Fostering and nurturing judgments is an ongoing task, not one that once completed can be forgotten. An enduring organizational capacity is required, including continual monitoring of public sentiment, research findings, and contextual changes that might challenge previously agreed-on policies (Stankey et al. 2003*a*). This could include structural changes (in-migration of new constituents) or changes in the social and political context (emerging social movements). Such activities are costly, but a failure to attend to such changes is likely to be even more so.

Sixth, RLKS management inevitably involves risks and uncertainties. In risk-averse environments, resistance to programs that acknowledge this explicitly makes it tempting to overstate the confidence in the outcomes of policies and programs associated with RLKS management. This has the potential for adverse consequences, including further diminution of public confidence in science (Hisschemöller & Midden 1999).

This challenges scientists to confront the inevitability of risk and uncertainty, including the need to be forthcoming about difficult decisions and choices. This means acknowledging the limits of scientific understanding and the importance of experimentation despite the inability to specify outcomes with precision. Specific steps to address these challenges include a commitment to monitoring and adaptive management. For example, Wondolleck and Yaffee (2000) report on the experience of developing a management strategy for the Oregon silverspot butterfly (*Speyeria zerene hippolyta*). Despite uncertainties about the consequences of the use of fire and mowing to create habitat, management agencies and nongovernmental organizations arrived at an agreement as to how to proceed. This involved a commitment to ongoing consultation with the U.S. Fish and Wildlife Service, implementation of variable intensity management programs and monitoring, and a commitment to information sharing and research.

Restoring public confidence is not easy, but it is essential in managing RLKS more effectively in the face of uncertainty. An important aspect of such efforts is providing a clear rationale for experimentation and displaying consequences, implications, benefits, and costs of alternatives for public review and evaluation. It also includes scientists playing an expanded role in public dialog. Opinion research shows that citizens and resource professionals alike believe better decisions result when biological scientists are involved (Steel et al. 2001; Lach et al. 2003). As Walker et al. (2002) observe, discovery is an iterative process and discussions among stakeholders, managers, and scientists are essential to identifying interactions and consequences, especially in complex situations.

Finally, accommodating social-acceptability judgments in species conservation decisions highlights concerns about fashioning innovative institutional structures and processes. Similar challenges are involved in management of common-pool resources and the need for design principles uniquely adapted to the challenges such resources present (Ostrom et al. 2003). In the case of RLKS management, efforts to incorporate social acceptability concerns are hampered by contemporary planning processes dominated by technical and rational models emphasizing quantitative data, objectivity, and expert input and analysis. Such models possess important strengths but are limited in their capacity to deal with many of the value-based issues that shape acceptability judgments (Wondolleck 1988). Although technical rigor, coupled with legal and procedural compliance, remains necessary, it is insufficient for promulgating socially acceptable decisions. More effort must be devoted to equity, inclusiveness (interests, knowledge, concerns), and transparency (Lach et al. 2003). In short, there is a need to reframe planning processes to couple traditional emphases on technical issues with approaches that embrace social and political aspects (Friedmann 1987). At the root of this imperative is the need to create planning processes grounded in the principles of democratic governance (Lee 1993).

These challenges call for innovative approaches to the credible incorporation of the public in planning processes. A growing literature addresses this issue. Various terms—civic science (Lee 1993), collaboration (Wondolleck and Yaffee 2000), mutual or social learning (Friedmann 1987)—describe the basic features of such alternatives. All share a concern with engaging citizens in ways that improve their capacity for informed participation. Such approaches offer the potential for an improved ability to address the factors shaping acceptability judgments. Citizen knowledge can support mutual learning among all stakeholders, including resource managers and scientists. Such "joint fact-finding. . .[which] places everyone on an equal footing, [involves] understanding the full resources at stake, the ramifications of different decisions, and the constraints bounding the realm of possible outcomes" (Wondolleck 1988:202). A proactive effort to engage the public enables managers and scientists to be aware of public knowledge and concerns and offers a forum where they can foster the ecological literacy that citizens require to engage complex issues (Thornhill 2003).

Management of RLKS is replete with challenges. Although our focus here has been on the United States, the challenges and the strategies have global relevance. Irrespective of cultural, biophysical, or political setting, management for species conservation must accommodate both technical and social concerns. Technical complexity and uncertainty characterize these issues, divergent public knowledge and interests are involved, and efforts to frame solutions often face an interest-ridden legal and political context. The willingness of parties to work

collaboratively is often problematic. Yet, in the absence of such willingness, the alternatives are limited: halt development until enough is known, pursue enforcement of legal remedies that protect species irrespective of other interests and consequences, or develop and modify the landscape irrespective of impacts and values. None of these seems desirable. Instead, innovative, collaborative approaches to RLKS management are needed. But a failure to commit to such approaches will make building socially acceptable strategies for these species a problematic endeavor, leaving the policy process dominated by guerilla-style politics and species losses that jeopardize a suite of values deemed important to society.

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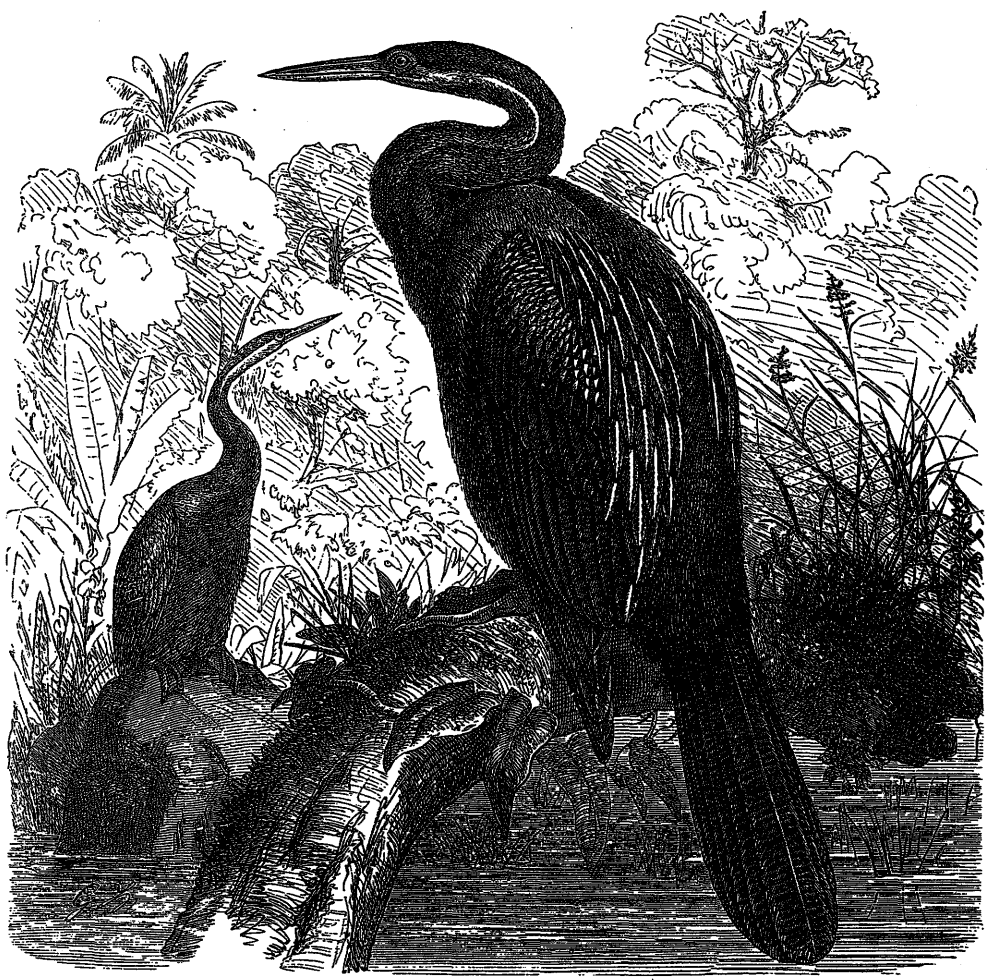
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