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Large Carnivore Conservation: Integrating Science and Policy in the North American West

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The North American Model of Wildlife Conservation

An Analysis of Challenges and Adaptive Options

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[–] Abstract and Keywords

The basic premise of the North American Model of Wildlife Conservation is that government wildlife agencies, funded by revenues from public hunting and fishing, use scientific knowledge and expertise to manage wildlife for the public good. Promoted as a century-long success story, the model establishes how wildlife will be used and who gets to decide. But there are concerns about its role and adequacy, including continuing species, population, and habitat losses and growing criticism of scientific management, experts and their roles in society, and the management agencies. This chapter describes the model's doctrine and formula and some of its problems, along with key elements of the social context, the status of wildlife, and the decision process in order to assess how the model has performed in practice. This appraisal suggests a problem definition based on public trust and common interests and offers three strategic options to adapt the model to new circumstances and enhance wildlife conservation.

Keywords: North American Model of Wildlife Conservation, wildlife conservation, appraisal, wildlife agencies, adaptation, problem definition, common interest

Introduction

Supporters of the North American Model of Wildlife Conservation claim that its historic principles and established practices offer the best means to conserve wildlife (including large carnivores) in the foreseeable future. Its basic premise is that government wildlife agencies, funded by revenues from public hunting and fishing, use scientific knowledge and expertise to

manage wildlife for the public good. Promoted as a century-long success story, the model establishes how wildlife will be used and who gets to decide, founded largely on concepts of public trust, scientific management, and single and multiple use formulas administered by government (e.g., Wildlife Society 2007; Prukop and Regan 2005; Geist 1995; Aldrich n.d.; Crane 2009). As such, it is clearly a constitutive process with institutional and organizational dimensions and many ordinary decision-making outcomes (see chapter 8).

There are concerns, however, about the role and adequacy of the model. Attributing its successes to hunters and hunting, some of its proponents want to enhance the role of hunting and fishing and encourage the urban public to participate in activities that support the model (e.g., Mahoney 2004a, 2004b, 2006; Mahoney et al. 2008; US Fish and Wildlife Service 2008). Other interests want to include the broader public in wildlife management, believing that diverse perspectives and values beyond those of hunters and anglers should be involved (e.g., Jacobson et al. 2010; Steelman 2010). In addition, we suggest that the model's actual conservation record over the past century is not as impressive as is sometimes suggested. **(p. 290)** Despite restoration of turkeys, white-tailed deer, and a few other species, populations and species at many locations have lost ground and face increasing losses from: (1) environmental changes (e.g., habitat degradation and loss, endangerment and extinction of nongame species, and global change); (2) broad social changes (e.g., economic upheaval, industrialization and energy development, agricultural expansion, urbanization); and (3) declining hunter and angler populations, along with an expanding urban population little connected to wildlife and nature. Much of wildlife conservation is based on positivism (Romesburg 1981, 1989). There is growing criticism of scientific management and positivism, of experts and their roles in society, and of the state and federal agencies that manage wildlife and land (e.g., Nie 2004; Ascher, Steelman, and Healy 2010). So what is the future of the model in managing fish and wildlife? Stemler (2008) also considered this question in writing about the White House Conference on Wildlife Policy. The Wildlife Society (2007), National Rifle Association, Rocky Mountain Elk Foundation, and Sierra Club are among the groups that have also invited reflection about the model's adequacy. We hope our analysis adds to this growing discourse and improves wildlife conservation.

We describe here the model's doctrine and formula and some problems it faces. We examine key elements of the social context, the status of wildlife, and the decision process in order to assess how the model has performed in practice. Building on this assessment, we suggest a problem definition based on public trust and common interests and offer three strategic options to adapt the model to new circumstances and enhance wildlife conservation.

Our analysis, empirical and data based, meets widely recognized standards of "meta" analysis (see Lasswell 1971). We seek a comprehensive, fundamental understanding of the model and its context using well established and widely used interdisciplinary theory and methods (e.g., Lasswell and McDougal 1992). This approach focuses on the dynamics of individuals, values, beliefs, practices, and institutions (Lasswell and Kaplan 1950). It requires users to establish their observational standpoints, clarify public order and human dignity goals, carry out procedurally rational tasks, map the full context, understand decision making, and attend to matters of content and procedure. Data came from online sources, professional journals,

literature from associations, federal and state fish and wildlife agencies, academic institutions, and museums (e.g., peer-reviewed literature, Yale Peabody Museum, Heinz Foundation's Millennium Report 2005). We also reviewed other sources that provide insight into the model and its operation (e.g., Orion: The Hunter's Institute [no date], White House Conference on Wildlife Policy (p.291) 2008). We consulted knowledgeable practitioners in universities, nongovernmental organizations, and agencies.

Concerning our standpoint, we have worked to improve wildlife management and conservation issues for over forty years in the United States, Canada, and elsewhere. Our experience includes field biology, scientific research, management, development, policy analysis, and education. We have worked for and with state and federal fish and wildlife agencies, NGOs, the private sector, landowners, industry, elected officials, and universities. We acknowledge that the subject of this chapter poses many analytic challenges, including understanding interactive ordinary, governance, and constitutive dimensions, and that there are reasonable contrasting interpretations. There are also other analyses that concur with ours (e.g., Jacobson and Decker 2006; Jacobson, Decker, and Carpenter 2007; Jacobson et al. 2010; Leopold 2010; Organ, Mahoney, and Geist 2010). Our observations constitute a “hypothesis-schema,” open for further research and testing, which we encourage (see Lasswell and Kaplan 1950). In the end, we seek to enhance wildlife conservation for the common good via open, inclusive, comprehensive, targeted, fair, cooperative, and effective means.

The North American Model

This section describes the history and principles of the model, its institutional and organizational setting, problems noted by its supporters and others, and its social context.

History and Doctrine

Antecedents of the model go back to Anglo-Saxon law and the Magna Carta of 1215 (historical discussion in Lund 1980; Roth and Boynton 1993; Tilleman 1995; Bean and Rowland 1997). The following description of the model's seven-part doctrine is based on Geist, Mahoney, and Organ (2001).

The first element of the doctrine is that “wildlife is a public trust resource.” The idea that wildlife could not be privately owned is evident in Biblical writing and in the inclusion of wildlife among things that could not be owned as codified in law by Roman Emperor Justinian in A.D. 529 (Geist et al. 2001, 176). In the early part of the eleventh century, Danish King Canute altered this code in England and made wildlife the property of the king and elite landowners (Adams 1993). Two hundred years later the Magna Carta reaffirmed the rights of the public in fish and wildlife. The first major case in the United States addressing what is now “The Public Trust Doctrine” was a Supreme Court decision in 1842, *Martin v. Waddell*, in which a landowner (p.292) claimed that King Charles II had made a land grant in 1664 that gave him exclusive rights to harvest oysters (Geist, Mahoney, and Organ 2001, 177). Chief Justice Roger Taney ruled, based on the Magna Carta, that the king had held fishing rights as a public trust. In colonial times, since New Jersey at that time held fishing rights for the oysters, these rights were considered to be in the public trust (Bean and Rowland 1997). This set the stage for later government in the United States, at federal and state levels, to maintain oversight of wildlife in

the public trust. The extinction or near loss of passenger pigeons, bison, elk, Carolina parakeets, and other species caused sportsmen and conservationists to lay the foundation for the model.

Second is the “elimination of markets for wildlife.” History demonstrates that wildlife can be rapidly depleted when dead animals are considered valuable (Hewitt 1921; Matthiessen 1959). The passenger pigeon, once the most populous bird in the United States, was hunted to extinction as a cheap food source. The last remaining passenger pigeon died in the Cincinnati Zoo in 1914. Some trade in wildlife remains today (Organ, Gotie et al. 1998; Prescott-Allen and Prescott-Allen 1996).

Third is the “allocation of wildlife by law.” From a consumption perspective, “surplus wildlife” is allocated to the public via permits and licenses for fishing, hunting, and trapping. Such allocations are not dictated by the market, landowners, or special privilege. Additionally, the public should have input into wildlife conservation (Geist 1995; Geist, Mahoney, and Organ 2001, 177–78).

The fourth principle is that “wildlife can only be killed for a legitimate purpose.” As a public trust resource, wildlife can only be killed for legitimate reasons, including food, fur, self-defense, or protection of property (Geist 1988, 1995). Conservationist George Grinnell developed the “Code of the Sportsman,” which included the idea that wildlife killed by sport hunters should not be wasted (Organ, Muth et al. 1998).

Fifth is that “wildlife are considered an international resource.” Wild animals do not recognize territorial or political boundaries in their movements. The Migratory Bird Treaty of 1916 was the first significant treaty between the United States and Canada to protect wildlife (Hewitt 1921; Jahn and Kabat 1984). Other international agreements followed.

The sixth element is that “science is the proper tool for discharge of wildlife policy.” Aldo Leopold was a proponent of the use of positivistic science for allocating natural resources. This is a component of the “Roosevelt Doctrine,” which depends on scientific management (Leopold 1930, 1933; see also Romesberg 1981, 1989; Morcol 2001; S. Clark et al. 2010). These concepts are **(p.293)** central to the wildlife profession today (Geist, Mahoney, and Organ 2001, 178; Gill 1996).

Seventh is the “democracy of hunting.” This means that hunting should not be restricted to those of means, upper class, or any other special interest. In Aldo Leopold's words, a key element of hunting is the “democracy of sport” (Meine 1988, 169). Hunting is considered a democratic activity because all citizens have the right to engage in it. Sport hunting is distinguished from market hunting, which does not ascribe to the code of “fair chase” (Posewitz 1994; Kerasote 1994).

Formula And Institutions

In practice, this doctrine is carried out through a formula that is structured by the use of science, state and federal government, and interested associations. These practices and organizational networks constitute the “institution” of wildlife management. Institutions are the “well established and structured pattern of behavior or of relationships that is accepted as a

fundamental part of a culture” (*Webster's* 1994), or “the shared concepts used by humans in repetitive situations organized by rule, norms, and strategies” (Ostrom 1996, 86; see also Young, King, and Schroeder 2009).

Along with the doctrine, the formula establishes an authoritative and controlling structure for the model (see Lasswell and McDougal 1992). The formula is complex and includes the 1930 “American Game Policy” developed by Aldo Leopold and others, who called for stable funding and for training of wildlife professionals. Following the Dust Bowl of the 1930s, Congress passed the Federal Aid in Wildlife Restoration Act in 1937 (16 USC §§ 669-669k), which is also known as the Pittman-Robertson Wildlife Restoration Act, or PRWR. Wildlife programs at the federal and state levels ensued. Since Franklin D. Roosevelt's signing of the PRWR in 1937, some species have been restored, including the wild turkey, white-tailed deer, pronghorn antelope, wood duck, beaver, black bear, giant Canada goose, American elk, desert bighorn sheep, bobcat, mountain lion, and bald eagle (USFWS Southeast Region: Federal Aid Division website).

The formula is further specified in other federal prescriptions. The Sport Fish Restoration Program (SFR), authorized by the Dingell-Johnson Act (16 U.S.C. §§ 777-777l), was passed in 1950. Both PRWR and SFR generate revenue by taxing consumptive users, that is, hunters, anglers, boaters, and shooters. Funds are held in public trust controlled by the US Fish and Wildlife Service (2008, 2009a, 2009b, 2009c). These acts authorize the Secretary of the Interior to cooperate with the states, through their fish and wildlife **(p.294)** departments, in implementing sport fish and wildlife restoration projects. The funds are apportioned annually based on a formula that includes land area and the number of licensed hunters and anglers in a state (http://wsfrprograms.fws.gov/Subpages/GrantPrograms/WR/WR_AppnFormula.pdf). In addition to the federal government, state wildlife agencies are also prominent in the wildlife institution, as are user associations, such as Ducks Unlimited.

The total amount of funds generated by SFR from 1952 through 2010 was \$6,583,260,439 and for PRWR 1939–2010 was \$6,411,069,221. The total amount of SFR funds apportioned in 2010 was \$389,552,973; for PRWR it was \$472,719,710. In comparison, the State Wildlife Grants Program, which does not derive funds from excise taxes, uses federal grant funds for programs that benefit wildlife and their habitats, including species not hunted or fished. The amount apportioned in 2010 under the State Wildlife Grants Program was \$73,767,660 (USFWS Wildlife and Sport Fish Restoration Program Website 2010). Clearly, funds for fish and wildlife conservation have been significant.

Resources, monetary and otherwise, are always a key concern in policy. The model's formula is set up so that consumptive users of a resource pay for access, the federal government administers funds, and state agencies manage the wildlife “resource.” This arrangement creates a convergence of interests among sportsmen (clients), government fish and wildlife agencies (suppliers), and other interests, including the industries that manufacture the products that are taxed. However, the model is viewed by some as only marginally responsive to their interests, including many people who are concerned about animal rights and welfare, nonconsumptive recreationists such as wildlife watchers, and the general public, who are not significant contributors to or participants in the model as institutionalized (see Mattson and Clark 2010).

Also, chapters 2 through 7 document how the formula is implemented and what the outcomes are in practice.

Problems in Practice

The model is a shared worldview or paradigm about wildlife and our relation to it (and to nature) that has served as a “working specification of the common interest” for the last century. This model coalesced shared beliefs and institutional arrangements that have conserved, restored, and maintained many wildlife species and populations, but not without problems and growing challenges. For example, at various times and places, the model has been **(p.295)** used to justify extermination of large carnivores for purposes such as increasing populations of ungulate game species (e.g., Robinson 2005).

Diverse interrelated problems have been articulated pertaining to wildlife conservation, the context, the agencies, and the model itself. For example, the Association of Fish and Wildlife Agencies and the US Fish and Wildlife Service assert that wildlife and the agencies are facing new challenges, including shrinking funding, global climate change, urban sprawl and encroachment, and an increasingly urbanized society disconnected from the natural environment. According to Aldrich (n.d.), hunting is the “glue” for success of the model, and Stemler (2008, 1) noted that the decline in hunting and hunters is problematic, as is the loss of “access to quality hunting opportunities.” Further, Semcer (2008, 4) wrote that “communication and coordination” are problematic for the model. Importantly, the model has not been extended beyond North America, and damaging markets for wildlife have not been eliminated globally.

Consider the problem of shrinking funding. US society and outdoor recreation are changing in ways that have reduced the user groups that supply the revenue for wildlife conservation under the model. According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USFWS 2006, 4), there has been a downward trend over the last few decades in the United States in the number of hunters (12.5 million) and anglers (30 million), with a combined total estimated at 33.9 million today. Simultaneously, there has been an increase in the number of wildlife watchers, which includes nonconsumptive activities such as bird watching or photography, to approximately 71.1 million (USFWS 2006, 4). This strongly suggests a need to include other types of participants in the model beyond hunters and anglers.

An additional problem is the conservation of species and populations other than game. “Nongame” makes up the vast majority of wildlife species, and its conservation has been largely ignored or minimized by state agencies (Nie 2004). Although many nongame species, such as some types of bats, are eligible for funding and restoration through the model, these species are not receiving adequate assistance because of traditional thinking in the agencies that funds should first benefit species directly related to hunting and fishing. Additionally, state agencies’ thinking, in too many cases, is itself problematic when it comes to addressing large carnivore conservation, ecosystem management, and climate change (Nie 2004). In fact, the increasing number of threatened and endangered species could be viewed as a growing failure of the state game and fish organizations, as well as the overall institution **(p.296)** of wildlife management and the model itself (Clark and Rutherford 2005; Jacobson and Decker 2006; Jacobson et al. 2010). Wildlife conservation is further hindered by overlapping, competing, and contradictory policy sectors (e.g., housing, jobs, healthcare). Priority given to job creation, for example, may

override considerations for wildlife habitat conservation. There are numerous larger national issues, such as national security, economy, and energy concerns that intersect with conservation and compete for time, attention, and resources. Such conflicts with wildlife conservation are expected to intensify.

“State wildlife governance” is also problematic (Jacobson and Decker 2006; Jacobson, Decker, and Carpenter 2007; Jacobson et al. 2010). Nie (2004, 199) is critical of present arrangements, which center on states’ rights, scientific management and positivism, and bureaucracy, including state wildlife commissions, game-dependent agency budgets, and the role of both in ongoing political conflict. He says that the “state wildlife management paradigm is characterized by scientism and agency capture,” issues that have been recognized since the 1970s (e.g., Tober 1989; Mangun, O’Leary, and Mangun 1992; Kellert 1996). Consequently, nonconsumptive users have challenged the client or user-based paradigm of state programs (e.g., Hagood 1997). These people have criticized the commission framework and have argued that the current formula runs counter to the idea of wildlife as a public trust because most Americans do not hunt, shoot, fish, or trap (e.g., Pacel 1998). These interests have also charged that wildlife commission members often have conflicts of interest because they have financial stakes in consumptive uses of wildlife, such as ranching and hunting (e.g., see Alaska Wildlife Alliance 2000–2001).

The model is also sometimes weak in practice. For example, Mattson and Chambers (2009, 113) found that management failed to provide water for Arizona’s desert wildlife as planned. They also found that the decision process used by the agencies was “shaped by the precepts of scientific management” (i.e., positivism, objectivism, and instrumentalism, experts always know best) and “thus largely failed to foster civility, common ground, and a focus on common interests, and instead tended to exacerbate deprivations of dignity and respect” for many people who care deeply about wildlife conservation. The use of ballot initiatives is one way around the problem of state wildlife commissions and agency bureaucracies not addressing issues of importance to the public (Nie 2004; Mattson and Clark 2010); the public simply puts an issue on the ballot, votes on it, and bypasses the commissions and agencies.

(p.297) Some of the problems identified here focus on *content*, that is, biophysical issues such as habitat and ecosystem degradation and threatened and endangered species problems. Other problems focus on *procedure*, or social and decision processes, such as policy influences of traditional hunting and wildlife interests or the privatization of wildlife through game ranching and commercial hunting. The cases in chapters 2 through 7 illustrate these problems.

The Decision-Making Process

In order to appraise the utility of the model and offer a comprehensive problem definition, we examine the status of wildlife conservation briefly with regard to context, wildlife, and decision making that must be addressed if wildlife is to be effectively conserved in the future.

Context

To understand the model’s context, we mapped its social process. In other words, we identified participants who are involved, their perspectives, their value demands and claims, and their strategies (see Muth and Bolland 1983; Anderson 1999). There are many participants involved

with how wildlife is managed in North America and who gets to decide, including international, national, and state governmental agencies, scientific experts, nongovernmental organizations, special interests, transnational public and private groups, and individuals. Each consists of people with particular perspectives (voiced in their claims), values, and preferred strategies—all of which play out in the debate and determine the outcomes and effects in institutional terms.

The social process of the wildlife management arena is complex, dynamic, and full of conflict. There are supporters and opponents of the model. Supporters include, for example, hunters and anglers, the Association of Fish and Wildlife Agencies, Ducks Unlimited, National Rifle Association, Rocky Mountain Elk Foundation, part of the general public, many wildlife professionals, many elements within state and federal agencies, National Audubon Society, Defenders of Wildlife, National Wildlife Federation, businesses and industry groups related to sporting supplies and equipment, and outdoor and recreational interests. Opponents are also a diverse group that includes some landowners (particularly ranchers and farmers), many nonconsumptive users, some development and exploitation businesses (e.g., oil and gas industry), and organizations devoted to animal rights, such as People for the Ethical Treatment of Animals and the Humane Society of the United States. Some of these groups are utilitarian, others conservation- or preservation-oriented. **(p.298)** Some promote animal rights and oppose all consumptive use of wildlife. Others are simply indifferent and passive. Much of the general public—unconnected to wildlife except for the squirrel or rabbit in the yard, the occasional viewing of the “Animal Planet” channel on TV, or a family trip to the zoo—is unaware of the model’s existence and its influence on the biological and political landscape.

Each of these people or groups has certain expectations about how the world works and makes demands or claims for certain value outcomes based on those expectations. Claims give us insight into the subjective perspectives of people, including how they identify themselves, for example, as a “woman,” “hunter,” “wildlife agency employee,” or “scientist.” For example, some supporters consider the model one of the most significant environmental success stories (e.g., Ball 1985; Kallman 1987; Mansell 2000; Leopold 2010; Miller 2010; Organ, Mahoney, and Geist 2010), claiming that it reversed the exploitation of wildlife and turned wildlife management into a “triumph of the commons” (see Hardin 1968 for discussion on commons; Geist 1988, 1995), that it is the envy of the world, and that it has restored white-tailed deer, wild turkeys, and other game species through the payment of excise taxes by anglers, boaters, hunters, and shooters (Geist, Mahoney, and Organ 2001).

Knowing about claims allows an analyst to understand why people behave as they do. Claims appeal to several generalized value categories— power, wealth, respect, knowledge, skill, affection, rectitude, and well-being (with no rank or order intended; Lasswell 1971; Clark and Rutherford 2005, 220–23). The appendix shows a sample of supporters’ claims concerning the model taken from the literature cited in this chapter. The dominant claim, in terms of values, is for rectitude: the claimants see a moral imperative or responsibility to manage wildlife for future generations to enjoy.

Also key to understanding the social process is to look at the symbols people appeal to and their politics (see chapter 8). Both supporters and opponents invoke symbols in support of their claims. Supporters of the model invoke heroes such as Theodore Roosevelt, Gifford Pinchot, and

Aldo Leopold, all figures who were instrumental in developing the model, essentially part of the original “wise use doctrine” (Trefethen 1975; Reiger 2001). They also single out hunters and hunting (and less so anglers and fishing) as key to the success of the model, connecting outdoorsmen with the North American pioneer spirit, which they claim is best evoked and nurtured through the hunting experience once frontiers disappeared (see, e.g., Slotkin 1973, 1985, **(p.299)** 1992 on the American frontier myth; Brown 2007a, 2007b, 2008 on the history of wildlife conservation). Supporters’ lore is also full of tales of successfully plucking species back from the brink of extinction. Furthermore, they claim that the model is a system of “sustainable development,” wherein wildlife is a renewable, harvestable natural resource (Geist, Mahoney, and Organ 2001). From an analytic standpoint, these symbols are the relatively popular expressions of people’s basic beliefs or worldview. Lore, stories, legends, heroes, and other symbols function to reinforce views of the success of the model, provide insight into supporters’ dominant narratives, and divert attention away from content and practical matters.

“Scientific management” is one of the most important symbols in wildlife management (see Romesberg 1981, 1989 for descriptions). It is valuable, without a doubt, but it is proving in many cases to have harmful consequences for management, policy, and democracy (review in Brunner et al. 2002, 2005). As Merkle (1980, 244, 1998) noted, “scientific management, translated into politics, advocated the development of the state as an organ of national planning and allocation according to a rationally derived system of priorities; it glorified a monolithic rational-technical order in place of the weak democratic forum that compromised among the interests of power groups.” The harms of scientific management, especially as used by state game and fish agencies and some units of the federal government, have been well documented (e.g., Odum 1989; Daily 1997). In general, people tend to pay little attention to social and decision-making processes and rely too heavily on standardized, bureaucratic, one-size-fits-all, technical rationality, and the dominance of experts (see Saul 1993, Scott 1998 for criticisms of this approach).

It is clear that wildlife conservation is a complex social and decision-making process involving diverse groups with opposing perspectives, value claims, and centers of attention. However, a major problem exists in that there is no adequate arena or process to meld conflicting interests into a shared view of the challenges to wildlife conservation and the practical actions needed to ensure a healthy future for wildlife. Another significant contextual problem is a lack of self scrutiny within the agencies and non-governmental groups, both of which lack attention to their own operating assumptions, practices, and consequences (see Cherney 2011). Future research can help map the context more fully, aid understanding of participant interactions, and thus yield greater insight into the context of the institution of wildlife management and the model.

(p.300) Wildlife

We also looked at the changing status of wildlife and its environments to see if the model, especially its organizational and institutional manifestations, is as effective as some supporters suggest. Regarding the status of species, for example, in 2000 a joint effort by the Nature Conservancy (2001) and the Association for Biodiversity Information evaluated the status of species in the United States. The total number of vertebrate species was estimated to be 2,497. Of these, 1,883 species (75 percent) were considered to be secure or apparently secure. The

status of five species was unknown. Of species not considered secure or apparently secure, 135 were reptiles or amphibians, which, along with invertebrates, are not included for conservation funding under the model as currently instituted. This leaves 474 mammal, bird, or freshwater fish species that are presumed extinct, possibly extinct, critically imperiled, imperiled, or vulnerable (Stein, Kutner, and Adams 2000, 104). Since the Endangered Species Act was enacted in 1973, there has been an increase in the rate of listings, most attributed to the addition of numerous plants (Stein et al. 2000, 107). The status of many species is unknown. Furthermore, as of October 2013, there are 1,010 vertebrate animal species and populations worldwide listed as “threatened” or “endangered” by the US Fish and Wildlife Service and protected under the Endangered Species Act. Of these, 361 are mammals, 318 birds, and 167 fishes. The vast majority of the world's reptiles and amphibians that occur in the United States, for example, are not eligible for funding from the Sport Fish or Wildlife Restoration Acts because they are not huntable “game species” (USFWS Endangered Species Program website). As well, large carnivores over the last 100 years have generally not fared well under the model and its structural manifestations. These data suggest that the model should be evaluated, revised, and made more effective to reverse the growing trend in species and populations at risk.

An increasing number of university-based ecologists and conservation biologists have investigated species status, threats, and likely future trends. For example, Pimm et al. (1995) found that worldwide extinction rates are 100 to 1,000 times prehistoric levels and increasing, and they estimate that future extinction rates will be ten times greater than recent rates with many species not now threatened becoming extinct. Concerning climate change, Walther et al. (2002) noted that there is ample evidence of ecological impacts of recent climate change from polar terrestrial to tropical marine environments. These changes will have huge consequences on the status and viability of species. Already, the decline of US species and populations in recent decades is evidence that the model is less than fully successful in those cases.

(p.301) Wildlife depends on suitable habitats and ecosystems. Habitat quality and ecosystem integrity affect and are affected by biodiversity (Chapin, Kofinas, and Folke 2009, 36–38). We now know that more than half of the ecosystem services that humans need for survival and quality of life have been degraded as people struggle to meet their material desires and needs (Heinz Foundation 2005). Many ecosystems are on the decline, and climate change is expected to affect them all dramatically (Steffen et al. 2004; Foley et al. 2005; Heinz Foundation 2005; also Turner et al. 1995; Redman 1999; Jackson 2001; Diamond 2005). There is a coherent pattern of ecological change in flora and fauna in response to these community and ecosystem trajectories. From this and other research, it is clear that we are in the early stage of massive change (Scheffer and Carpenter 2003; Myers 1996; Constanza et al. 1997). Global biodiversity scenarios are being generated now (see Sala et al. 2000; Tylianakis et al. 2008) along with many suggestions about what to do (e.g., Soulé et al. 2005; Sinclair and Byrom 2006; Hobbs and Harris 2001). These data suggest that the model, and its structural and cultural dimensions, has not done enough to slow or reverse the growing trend in ecosystem degradation and loss.

Human impacts on wildlife, habitats, and ecosystems have changed over time, and affected ecosystems are changing more rapidly now than at any other time in human history. The present downward projections in the status of wildlife and ecosystems bring into sharp focus questions

about whether the model is capable of conserving wildlife and ecosystems into the future without major adaptations.

Decision Process

Often people do not conceive of wildlife conservation as a decision process that requires balanced attention to matters of content and procedure. Nevertheless, the outcomes of the decision-making process determine what happens to wildlife. The decision process is our means of reconciling, or at least managing, conflict through politics in order to find a working specification of the community's common interests. Although most wildlife literature does not address this subject systematically or explicitly, we drew on the few available examples (e.g., Mattson and Chambers 2009), the case studies in this volume, and our own experience in the following appraisals.

Decision making is generally considered to have seven interrelated functions: (1) intelligence gathering and planning; (2) debate and promotion about the nature and status of the problems; (3) deciding on a plan to solve the problems (in other words, setting new rules); (4) invoking the new rules (**p.302**) in specific cases; (5) applying the rules through administrative and judicial activities; (6) appraising progress or lack of it; and finally (7) terminating the rules when they no longer apply (Lasswell 1971; S. Clark 2002). These functions do not necessarily occur in order; several functions may be ongoing at the same time in any single program. Claimants in the literature that we reviewed targeted one or more parts of the decision process for comment. For example, the Wildlife Society (2007) made five claims (see appendix), some of which called attention to the promotional activity in the decision-making process (i.e., advancing a perspective in the debate about wildlife). Other claims have to do with appraisal (evaluation), implementation, and intelligence (data gathering and planning). Most of the supporters profiled in the appendix focused on appraisal and promotional activities, but none called attention to the entire process or the need to upgrade it. Clearly, the focus of attention of participants is selective and incomplete. Having a more comprehensive understanding of the decision-making process can ensure a more complete picture of wildlife conservation. Useful models of decision making exist that are already helping to reconfigure wildlife conservation.

Even though few people think in terms of decision process, some do in fact conceive of wildlife conservation as a process, at least implicitly. For example, Prukop and Regan (2005, 375-76), representing the Association of Fish and Wildlife Agencies, called for upgrading the intelligence function in their appeal for "more effective and widespread use of human dimensions information." They sought an upgrade in the promotion function when they cited the need for "new or improved conservation alternatives, with a better understanding of them, their costs, and benefits" (see T. Wilkinson 1998). They were actually calling for upgrading the prescription function when they called for "broadening the conservation agenda to reflect a diversity of values, users, and their desires." They were also looking for better application of conflict management when they sought "more direct approaches for dealing with moral and ethical issues." Finally, they sought better appraisal when they said that "more effective evaluation of our efforts" was needed. Overall, their recommendations—which call for upgrading six of what we identify as the seven functions of decision making—suggest that the decision process needs to be made more open to everyone, more factual about the entire context, more creative in finding facts about the social, economic, and political environment, more comprehensive,

integrative, and effective, more timely and prompt, more focused on achieving common interests, more constructive, and more contextual or practical. Recurring weaknesses that characterize each of the decision process functions, such as expert biases, poor **(p.303)** government coordination, agency rivalries, overcontrol, “benefit leakage,” intelligence failures and delays, inadequate coordination and appraisal, inappropriate organizational arrangements, insensitivity of decision makers to valid and appropriate criticism, and failure to end programs and move to new ones, all must be preempted (e.g., S. Clark 2008, 139–71).

To complicate matters, there are two types of decision processes that are rarely distinguished, as discussed in chapter 8. *Ordinary* processes are those in which decisions are made regarding everyday problems; they focus on content choices about population size, for instance, or habitat quality. *Constitutive* decision processes set the rules, procedures, and norms that govern ordinary processes; these are decisions about how to make decisions (McDougal, Lasswell, and Reisman 1981; McDougal 1992–1993). They focus on procedures about how policy should be made and, by implication, who ought to be involved in the decision process (S. Clark 2002, 71). Constitutive processes transcend everyday operations to determine how organizations, institutions, analytic methods, and participants ought to be structured or selected (see Lasswell 1971, 98–111). When seeking to improve wildlife conservation, both ordinary and constitutive processes should be targeted for improvement. As Geist (2004, 1) observed, “Thus [the model is] the product of innumerable political discussions—acrimonious or otherwise. It is not the product of a single mind but expresses the collective wisdom of nearly a century of continent-wide debate and hard bargaining. It has retained what has worked. It therefore has a deep wisdom and could not have been invented by any single mind.” He goes on to state that the model has “been examined by a number of symposia and has been discussed in the popular press and on the [I]nternet” (1). Many people involved in wildlife conservation seem to pay most attention to ordinary process and focus on technical content details while overlooking or underattending to constitutive process considerations. Since most wildlife professionals are involved at the ordinary level, most published cases are told from that perspective, typically uncritically promoting and reinforcing the symbols, doctrine, and formula of the model. However, a growing number of people appear interested in the constitutive process, even though they do not use these concepts, distinctions, or language.

Our findings about the context, the status of wildlife, and decision making have practical consequences for the future of the model and for wildlife conservation. The practical task now is to use these findings to construct a realistic problem definition of the conservation challenge at hand. A good problem definition will provide feasible opportunities to improve the decision-making process, activity by activity, and adapt the model's doctrine **(p.304)** and formula (see, e.g., Brunner 2010). Traditional science alone offers no such method, at either ordinary or constitutive levels, for creating robust problem definitions that will be useful to society in solving the problems of conserving wildlife and ecosystems.

A Problem Definition and the Common Interest

Although the model has served the American public fairly well over the last century, it shows growing problems of content and procedure today as evidenced in the literature and in practice. A growing number of wildlife species and populations and their habitats and ecosystems are under stress created directly or indirectly by human action. There is also growing demand for

more effective social and decision-making processes. These problematic trends and conditions are accelerating. These content and procedural problems—part of a single complex system—as well as the system-wide and institutional nature of the challenges have been recognized, and efforts of varying quality and success have been undertaken to address them.

Yet additional problems also exist. The North American Model is a response to historic cases and incidents (such as the decline of bison, turkeys, deer) and a product of the overall dynamics of our society and culture and its use of natural resources (such as the rise and establishment of bureaucracy and scientific management) since the late 1800s through the mid-1900s. It seems, however, that ongoing constitutive dynamics—efforts to adapt in response to changing circumstances—have been limited to ordinary, conventional means, such as “educating” the public, enlarging bureaucracy, undertaking “campaigns,” litigation, expanding positivistic science, or seeking influence and money. But employing ordinary, conventional perspectives and means to address constitutive challenges will not advance our understanding of the complex social and decision-making processes involved in wildlife conservation, nor will it result in success, that is, adaptive responses to the growing content and process challenges over the mid to long term.

Another problem is self-limited learning by supporters of the model. If supporters’ loyalty to the model and its institutional forms, however admirable, leads to promoting it uncritically and recycling its symbols as substitutes for addressing actual content and process problems, then potential improvements at both ordinary and constitutive levels will be blocked. Successful use and adaptation of the model requires learning and flexibility at individual, organizational, and policy levels, far beyond the conventional methods in use today (see S. Clark 2002, 166–72; Jacobson, Decker, and Carpenter 2007, 107; Ascher, Steelman, and Healy 2010, 196–197).

(p.305) Finally, it is debatable whether the model and its operational dimensions, as presently constituted, administered, and implemented, adequately serve common interests. Finding and securing common ground has always been a struggle in wildlife conservation. The overriding goal, as we understand it, is to conserve wildlife: this is a common interest that is shared by members of the community and benefits the community as a whole. In order to understand the diverse participants’ connections to the model and the validity and appropriateness of their claims in terms of the common interest, it will be necessary to examine competing claims about the model’s success and the need to adapt it.

A major step toward formulating a realistic problem definition would be a full appraisal of the model in terms of common interest concerns, using procedural, substantive, and pragmatic criteria (see Steelman and DuMond 2009). There is clearly no single and objective standard for such judgments, but currently, much of the decision making in wildlife conservation focuses on procedural and legal requirements or on satisfying special interest demands (see Lawrence and Daniels 1997), but these do not adequately address actual problems or fully meet the growing demands for more broad-based, common interest outcomes. Although we cannot offer here the comprehensive appraisal that is needed, the model at present appears to be a complex mix of common and special interests, principled and expedient interests, and inclusive and exclusive interests (see Lasswell and McDougal 1992). This makes it difficult for people to orient themselves to the arena, and it inhibits appraisal, learning, and adaptation activities (see

chapter 8). What is needed is wildlife conservation that favors common, principled, and inclusive interests.

The overall problem is an inability to adapt the model's doctrine, formula, and symbolic representations to the changing context and to integrate all valid and appropriate interests into wildlife policies that advance common interests. From a content point of view, the problem is clear—highly visible threats loom over wildlife and ecosystems. From a procedural point of view, the problem is an inability to satisfy demands for more inclusive participation in decision making by a non-consumptive and non-utilitarian public. These dual problems are remediable, at least to an important degree, with proper attention, organization, and leadership. Overall, we perceive that there is abundant opportunity to adapt the model, in both ordinary and constitutive ways, to advance wildlife conservation (see chapter 8). There are some adaptations underway currently around securing funding shortfalls at the state level, but these efforts fall far short of what is needed in terms **(p.306)** of adaptations in organizational culture and operations of state game and fish departments to broaden the funding base, meaningfully include non-traditional interests in decision making, and meet the demands of society for expansion of services (Jacobson and Decker 2006).

Moving Forward: Lessons and Recommendations

We offer three strategies to adapt the model to address these ongoing challenges, respecting the admonition of Boitani, Asa, and Moehrenschrager (2004, 159) to view large carnivore conservation “as a complex system of decision making that requires an interdisciplinary approach.” Modifications must take into account the need for not only scientific and technical input into decision making, but also social, political, and institutional considerations, all in an integrated fashion. Some supporters of the model are also calling for such changes, albeit in different language (e.g., see the six recommendations of Prukop and Regan 2005, sixteen strategies and six recommendations of the Sporting Conservation Council 2008, and others). Overall, a genuinely interdisciplinary, fully contextual approach is needed (see Clark and Wallace 2012).

Adapt the Model's Principles

We recommend modifying two of the seven doctrinal principles of the model to better reflect demands of the current conservation context, without jeopardizing the model's established value and potential for future success. The first modification is to the principle that “science is the proper tool for discharge of wildlife policy.” The principle of scientific management came into prominence decades ago at a time when positivistic science, “a science of the parts,” was the dominant paradigm (see Romesberg 1981, 1989 for a description of positivism; Merkle 1998). Many people still accept positivism as the only means of discovering truth and want to maintain its historic role in wildlife management. They presuppose that science should precede management and policy (see Pielke 2007 on the “linear science-to-policy model”). As valuable as positivism has been and remains, it is a paradigm with many drawbacks critiqued by Brunner et al. (2002, 2005), Brunner and Lynch (2009), Chapin, Kofinas, and Folke (2009), Pielke (2007), and others. It limits our understanding of what constitutes reliable knowledge, it overly objectifies our epistemology and privileges technical experts, and it excludes citizens directly affected by decision making from the process, among other drawbacks (see K. Wilkinson, Clark,

and Burch 2007). Its assumptions cause problems in wildlife conservation and in democracy (see Mattson and **(p.307)** Chambers 2009). Despite growing evidence of these limitations, positivistic conceptions of science, management, and policy still dominate the wildlife profession and the institution of wildlife management—its culture, the university programs that prepare professionals, and the management agencies and conservation organizations that employ them. Yet there are those who insist that the “science” is OK, that it's just “politics” that is the problem (see Pielke 2007).

In contrast, a growing number of people are calling for alternatives to positivism. “Ecosystem management” and “resilience-based ecosystem stewardship” are among the several options put forward (e.g., Chapin, Kofinas, and Folke 2009, 5; a survey is in Clark et al. 2010, chapters 1–3). But on closer examination, many articulations of these concepts are just new ways of repackaging, elaborating, and renaming scientific management while holding on to a positivistic epistemology. Nevertheless, the movement away from positivism is accelerating as evidenced, for example, in calls for a new interdisciplinarity for professional certification of wildlife biologists (e.g., the Wildlife Society 2007; see Bammer 2005, and cases in Brunner et al. 2002, 2005). Adaptive governance, an alternative that we support, is an integrative approach based on “a science of the whole.” It does not discard positivism, but puts it in its contextual place, such that science is necessary but not sufficient for good decision making. It calls for an explicit, systematic, empirical, and fully problem-oriented, contextual, and multi-method approach—a genuine interdisciplinarity (see Clark and Wallace 2012). This approach is quite different than the multidisciplinary approach called for by some authors (e.g., Jacobson et al. 2010).

Adaptive governance enables the kind of high-order integration that supporters of the model expect now, an approach not presently possible through scientific management. The role of adaptive governance in decision making has been shown to be practical in wildlife conservation. As a result of its successes, this alternative is backed by a growing number of supporters of the model. For example, Prukop and Regan (2005, 376) call for a broader science that will allow for a “stronger integration of human dimension and communication science in our decision-making processes” (see also Sporting Conservation Council 2008). Adaptive governance offers means for better problem solving, integration of knowledge and action, theory and practice, and on-the-ground gains. It rests on an analytic framework and methods, far beyond positivism, that can be taught, learned, and applied (Clark and Wallace 2012), although it has yet to be fully embraced by the wildlife conservation community. Adaptive governance requires meaningful public involvement **(p.308)** as well as expert input. It is an open, fully transparent decision-making process. It involves a process of problem solving that is much more open, grounded, and practical than traditional approaches. When used, it has proven more effective than traditional agency approaches.

The second principle of the model that we recommend be changed is the idea of the “democracy of hunting.” The contribution of consumptive users such as hunters and anglers is necessary for the model to function as well as it does and should be encouraged (see Mattson et al. 2006). However, these are special interests. Many more people who do not hunt or fish could be directly included in decision making about wildlife (e.g., nonconsumptive users such as wildlife viewers, outdoor recreationalists, and proponents of animal welfare). Inclusion of these people would enfranchise and create a bigger and more diverse public base of support, politically and

financially, for wildlife conservation (e.g., if excise taxes were implemented on goods used by these other interest groups). In fact, the “democracy of hunting” appears to conflict with two other principles of the model, that wildlife is a “public trust resource” and that it is an “international resource.” These larger interests—the general public and the international public—should be construed to represent the larger common interest.

This recommendation is also supported by others. For example, Crane (2009, 1) says that the model needs to appeal to the “direct interest” of a broader audience, including nonhunters and nonanglers. Supporters need to “aggressively engage hunters and anglers, wildlife enthusiasts, other conservationists, and the general public about the need to maintain wildlife” (Prukop and Regan 2005, 376). Together, the Association of Fish and Wildlife Agencies and the US Fish and Wildlife Service (2006, 6) noted that supporters “must take positive steps to encourage and nurture [public] interest in the natural world.” Modifications could be made to include more diverse interests (see Pimbert and Pretty 1995). McLaughlin, Primm, and Rutherford (2005) offer guidelines for successful inclusive, participatory projects. K. Wilkinson, Clark, and Burch (2007) provide an overview of the kind of joint problem solving that bridges across diverse people, perspectives, and interests. This change would make the model and its tangible elements significantly more democratic than hunting alone and more reflective of the current social context.

In sum, adapting these two elements of the doctrine would not compromise the goal of the model—enduring wildlife conservation—but would indeed enhance its ability to meet this goal.

(p.309) Adapt the Model's Formula

We also recommend modifying the model's formula, which rests on scientific management, bureaucracy, and a specific relationship with the public. First, scientific management provides a formulaic direction for implementing wildlife conservation as well as a doctrinal foundation. The formula, as noted by K. Wilkinson, Clark, and Burch (2007), relies on scientific theories, experts, and “progress” to address environmental problems. There are many well-documented cases of scientific management leading to disastrous consequences for nature and people (e.g., Scott 1998; Botkin 1990). Assumptions and reductionist scientific theories about how to define and solve problems often neglect to include “the indispensable role of practical knowledge, informal processes, and improvisation in the face of unpredictability” that have proven vital to a functional and healthy society (Scott 1998, 6). The model's formula, including the practices of state fish and wildlife departments, parts of the federal government, and some nongovernmental entities, could be improved by changing its reliance on scientific management.

Second, at present, the model is typically implemented through top-down federal and state bureaucracies that tend to centralize functions and enforce uniform rules and regulations (Galbraith 1977; Wilson 1989; Daft 1995). Bureaucracy is a specific kind of organizational form known for standardization, rigidity, and limited learning (see Etheredge 1985; Argyris and Schön 1978). Bracken (1984, 221) noted that bureaucratic organizations “have certain built-in tendencies, directions they naturally move toward when subjected to different constraints and levels of excitement,” which are hard to change. Bureaucratic programs are typically technical and acontextual, which causes inflexibility, limits participation, and elevates the technical expert to the role of decision maker. These bureaucratic elements play out in conservation efforts and

have significant consequences for effectiveness and democratic process (see Mattson and Chambers 2009).

To compound matters, in some regions, there are persistent conflicts between federal and state bureaucracies (e.g., when states claim absolute authority and control over all resident wildlife, even federally listed endangered species such as the black-footed ferret; T. Clark 1997). As Perrow (1970, 128) observed, “it is not difficult for an administrator to conclude that cooperation with another agency, unless it is on his own terms, will threaten his autonomy and threaten the wisdom of his approach or program” (see Miller, Reading, and Forrest 1996; Thomas 2003). Much has been written about the limitations of bureaucracy, its formulaic responses in general (e.g., **(p.310)** Wilson 1989), and its limitations in wildlife conservation in particular (e.g., Nie 2008). Many of the challenges the model now faces are the consequence of these formulaic (bureaucratic) conditions.

We recommend debureaucratizing programs and better managing inter-bureaucratic conflict. One way to overcome bureaucratic problems is to employ more practice-based, innovative, prototyping efforts. A proven strategy to enhance performance, a prototype is a trial or model, official or unofficial, from which something can be learned or copied. Prototypes are not fixed in structure or procedure in advance of beginning a project, but instead are designed and adapted to encourage learning and creativity as the project unfolds. Successful prototypical examples are evident in the field as people work in unique local contexts to address the limitations of bureaucracies (e.g., Wilson and Clark 2007; D. Clark, Lee et al. 2008; D. Clark, Tyrrell et al. 2008; Rutherford et al. 2009). What these practice-based efforts have in common is that they all work outside of agency bureaucratic operations to some degree, but at the same time they work with the agencies. They are much more contextual and participatory than traditional bureaucratic, scientific management (Brunner 2010). Other options to improve agency performance were surveyed by T. Clark (1997, 188–207), including reconstructing organizations, both in structural design and cultural dimensions, improving information processing and organizational learning opportunities, using high-performance teams (staffing, cognitive and emotional characteristics, and team leadership), and using “parallel organizations.”

We also recommend more effective, genuine public involvement. K. Wilkinson, Clark, and Burch (2007) looked at the challenges of inclusive civic discourse and democratic process, including building social capital, achieving civility in dialogue, and ensuring democratic process (see Ascher 2009; Ascher, Steelman, and Healy 2010). They concluded that successful processes require participants to be “aware of, and alive to, all interests involved, all relevant cultural perspectives, and how individuals relate to families, neighbors, social groupings generally and patterns of governance” (O’Riordan and Stoll-Kleemann 2002, 89). Pimbert and Pretty (1995) and Arnstein (1969) offer schemes and levels of public participation and recommend a high level of public involvement in all cases. Finally, improvements in leadership are key to overcoming the limitations of bureaucracy.

In sum, adapting these formulaic elements would further the goal of the model, not compromise it.

(p.311) Upgrade Capacity—Leadership and Skills

Last, we recommend upgrading the capacity of leadership to accelerate adaptation of the model. Leaders, in partnership with followers, should bring effective responses to problems of content and procedure in interactive ordinary and constitutive processes (see Ascher and Hirschfelder-Ascher 2005). Adapting the doctrine and formula and innovating through practice-based prototypes both require effective leadership. The challenge for leaders is to be problem-oriented and as realistically contextual as is practical, in both strategic and tactical senses. Leaders should attend to both high-order thinking (i.e., actively shaping the future) and fundamental philosophic matters (i.e., doctrine and formula) in addition to administering routine operations. These skills can be learned and used to good effect (Clark and Wallace 2012).

Some options to help leaders were offered by S. Clark (2008, 172–88) in the context of managing the Greater Yellowstone ecosystem. First, leaders should target themselves for self-improvement, that is, learn to think beyond bureaucracy, positivism, and standard operating procedures, and better clarify organizational goals, both official and unofficial. Clarifying goals is important because goal inversion or displacement is common (see S. Clark 2008). Leaders can also upgrade their problem-solving skills by formalizing and using interdisciplinary problem-solving methods; this requires them to be explicitly and fully problem-oriented (Clark and Wallace 2012). Leaders also need to select staff appropriately, work through partnerships, use high-performance teams, and employ tailored problem-solving exercises. These options promise leaders greater effectiveness, when employed with skill and vision.

Second, leaders can upgrade management policy processes by explicitly and systematically focusing on how the decision-making process works (S. Clark 2008, 189–208). Understanding the interactive activities of decision making, standards for good decision making, and common pitfalls can be tremendously helpful. Leaders should also be able to determine whether decisions are in the common interest from procedural, substantive, and practical standpoints (see chapter 1, this volume, and Steelman and DuMond 2009). They also need to be familiar with widely accepted standards for adequate intelligence gathering, processing, and dissemination and for organizing effective arenas for problem solving (see S. Clark 2009; Cherney, Bond, and Clark 2009). Finally, high-caliber leadership requires the capacity to learn actively through prototyping, drawing lessons from experience, and “double-loop” learning (i.e., examining operating assumptions and reassessing underlying goals; Schön 1983).

Third, leaders should move people and practices toward sustainability **(p.312)** (S. Clark 2008, 209–21) by accentuating positive trends, shifting the focus of attention toward more contextual approaches, and by becoming skilled change agents. Ascher (2009) argues that leaders are generally not farsighted enough in all these areas. There are many causes of shortsightedness, including, he argues, “pure impatience,” “selfishness,” “analytic limitations and uncertainty,” and “vulnerability” (29–43). Leaders need to find ways to gain traction to overcome these obstacles. Ascher offers tools for improving leadership. First, he suggests restructuring rewards and risks in management and policy (65–150). Included in these are ways to create and reschedule tangible benefits and costs and social and psychological rewards, ways to improve performance evaluation, and ways to encourage self-restraint on the part of selfish, powerful special interests. Second, he suggests ways to improve analytic frameworks, such as upgrading the rigor and comprehensiveness of analytic exercises and deepening problem definitions (151–

88). Third, he offers better ways to frame appeals for support and enhance communication effectiveness of farsighted appeals (189–230). Finally, he offers ways of changing the decision-making or policy process by empowering and insulating farsighted leaders and sustaining decision-making processes in the face of resistance (231–58). These options hold great promise. There is no lack of proven methods readily available to aid leaders' vital work (e.g., Steelman 2010).

These three changes—adapting the doctrine, adapting the formula, and upgrading leadership capacity and skills—require changes in people and their practices. A good place to begin is with current supporters of the model, who are most committed to the most effective wildlife conservation. These three recommendations, if successfully carried out, promise to aid wildlife conservation, serve common interests, and prepare the model for a more successful future.

Conclusions

For more than a century, North American society has pursued a goal of conserving wildlife as a public trust, a goal that has been structured and implemented through the North American Model of Wildlife Conservation, which today encompasses many diverse organizations, associations, and interests. At continental as well as local scales, wildlife conservation is a dynamic process of decision making involving people, values, demands, and the reconciling of conflict. Functionally, the model's doctrine (principles) and formula (rules to implement the doctrine) guide current decision making about wildlife; they dictate how decisions are made, by whom, and for what purposes. It is this decision-making process that must be used to adjust the doctrine (**p.313**) and formula of the model and its institutionalized structure to improve performance and adapt to changing circumstances.

Achieving the goal of conservation effectively in practice has been a struggle historically. Enduring wildlife conservation, especially for large carnivores, is becoming more difficult as more people compete for limited natural resources and other societal goals in today's rapidly changing world. At present, some supporters of the model and some organizations and institutions of wildlife management want to maintain it largely as it is, educate the public to its benefits, and enlarge traditional funding means. Others want to adapt the model in various ways and degrees. The basic question is whether the model and the institutional system for conserving wildlife can be adapted to keep pace with contextual changes.

We offer three options to make adaptations. A critical first step is to improve understanding of the context—the people involved, their perspectives, the values they seek and the claims they make, their strategies, and the outcomes they seek. This information can be used to upgrade the wildlife institution, make its decision-making processes more inclusive, and ensure a fair, representative, and balanced approach. Decision making can be upgraded to be more factual, timely, comprehensive, and effective. The common interest, as we see it, is to conserve wildlife for future generations in equitable, efficient, and inclusive ways. These are basic criteria for sound governance in a democracy and the most likely means for securing a biologically diverse world for all people to enjoy. Clarifying and securing this common interest is the key to a healthy future for wildlife.

Appendix Claims, Values, and Decision Activities in the Policy Process of the North American Model of Wildlife Conservation

Claimants and claims, values demands, and decision process activities in the policy process of the North American Model of Wildlife Conservation. See text for explanation of value demands and decision process activities.

The Wildlife Society (2007, 1-2)

Promote and support adherence to the seven core concepts of the model (see text).

Value demand—Rectitude (ethics, moral responsibility)

Decision process activity—Promotion (debate)

(p.314) Foster educational opportunities to increase societal awareness of the model.

Value demand—Enlightenment

Decision process activity—Promotion

Support critical review of the model.

Value demand—Enlightenment

Decision process activity—Appraisal

Support further refinement of the model.

Value demand—Skill

Decision process activity—Invocation/application (= implementation)

Support the identification of threats and challenges to the model.

Value demand—Enlightenment

Decision process activity—Intelligence

Alberta Wilderness Association (Geist 2004, 1-2)

The model is credited with halting Hardin's "tragedy of the commons."

Value demand—Rectitude

Decision process activity—Appraisal/promotion

The model is one of the "great achievements of North American culture."

Value demand—Rectitude

Decision process activity—Appraisal/promotion

The model is based on "raw grassroots democracy."

Value demand—Rectitude

Decision process activity—Appraisal/promotion

The model promotes "public involvement with wildlife."

Value demand—Rectitude

Decision process activity—Appraisal/promotion

Congressional Sportsmen's Foundation (Crane 2009, 6)

"The model is the system of conserving wildlife that 'is the most successful in history.'

"Value demand— Rectitude

Decision process activity— Appraisal/promotion

Geist, Mahoney, and Organ (2001, 175)

The model has become "a system of sustainable development of a renewable natural resource that is without parallel in the world."

Value demand—Rectitude

Decision process activity—Appraisal/promotion

(p.315) Geist (2004, 1-2)

The model is "held together by a brotherhood of blue-collar hunters and anglers."

Value demand—Rectitude/affection

Decision process activity—Appraisal/promotion

Mahoney et al. (2008, 8-17, 21)

Hunting has been critical to the success of the model (8).

Value demand—Skill/knowledge

Decision process activity—Appraisal/promotion

State and provincial governments.

Value demand—Power

Decision process activity—Appraisal/promotion

Hold wildlife in trust for the public (10).

Value demand— Power

Decision process activity— Appraisal/promotion

Democratic rule of law (12).

Value demand—Power

Decision process activity—Appraisal/promotion

Democracy of hunting (13).

Value demand— Power

Decision process activity—Appraisal/promotion

Science is the primary basis for wildlife policy (17).

Value demand—Rectitude/knowledge

Decision process activity— Appraisal/promotion

The North American Model of Wildlife Conservation has been responsible for a remarkable resurgence in wildlife as well as a staggering and diffuse economy that has enabled wildlife to “pay its way” across a vast and diverse continent (21).

Value demand—Rectitude/wealth

Decision process activity—Appraisal/promotion

Semcer (2008), Sierra Club

The model is “one of the most extensive infrastructures for the security of wildlife populations and the habitat on which they depend.”

Value demand—Rectitude

Decision process activity—Appraisal/promotion

Note

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