

## Evaluating Comanagement for Social-Ecological Fit: Indigenous Priorities and Agency Mandates for Pacific Walrus

Martin David Robards and Amy Lauren Lovecraft

---

*Governance arrangements such as comanagement are regarded by many as promising arenas for effective natural resource management. However, measuring comanagement's success at achieving conservation goals has been equivocal. Our research evaluates the lack of conclusive outcomes through a critical consideration of how different goals and values inherent in comanagement affect the institutional (or policy) diagnostic of "fit." More narrowly, sustaining natural resources requires that management policies foster fit between the scales of sociopolitical processes governing resource use and the scales of ecological processes regulating a resource. Without a process that encourages such harmonization, theoretical and empirical evidence suggests that comanagement regimes are unlikely to accomplish long-term conservation goals. We use a case study of walrus comanagement under the U.S. Marine Mammal Protection Act to demonstrate that when the formal institutions preconditioning comanagement do not develop out of a deliberative process among comanagement partners, two major problems can arise: (i) Policy institutions mismatch ecological and social processes relevant to resources and communities; and (ii) data to assess the fit of institutions and support learning is more difficult to acquire. In our case study, both these factors constrain the ability of comanagement to foster walrus conservation or support the capacity of Native Alaskans to adapt to contemporary social and environmental conditions. Our research concludes that to achieve marine mammal conservation, previous institutional arrangements framing comanagement that are predicated on static conceptions of people and ecosystems must be redesigned to provide better policy fit across local to international priorities. To do so requires opening up deliberative spaces, where Western science and priorities are confronted with indigenous perspectives. However, the benefit of enhancing deliberation carries risks and costs related to trade-offs between the values of democratic process, and protections for both wildlife species and indigenous groups.*

---

**KEY WORDS:** adaptation, comanagement, deliberative democracy, discourse, fit, governance, indigenous, marine mammal

### Introduction

Comanagement is a form of governance, commonly characterized by a pluralistic approach to sharing rights and responsibilities between governing entities and resource users (Berkes, 2009; Kellert, Mehta, Ebbin, & Lichtenfeld, 2000; Pinkerton,

2003; Plummer & FitzGibbon, 2004). The normative principles in operation for the majority of resource comanagement regimes, including broad participation, pluralism, accountability, and learning, have been drawn from the ecological resilience and commons literatures (Armitage, 2008). These parallel the core variables accepted as essential to legitimate governance systems found within the broader field of deliberative democracy (Gutmann & Thompson, 1996, 2004). Across both bodies of literature, key measurements of comanagement success are tied to transparency in data collection, decision making, and program implementation. However, in practice, while the adoption of comanagement regimes has proliferated, it has happened with, at best, equivocal evidence of what constitutes a successful outcome (Koontz & Thomas, 2006; Plummer & FitzGibbon, 2004; Sandström, 2009).

As a pragmatic arena of social deliberation and problem solving, comanagement attempts to fill the "institutional void" between governments and those it seeks to govern (Hajer, 2003). The developing enthusiasm and interest about comanagement among policymakers and social theorists has generally assumed that participatory and deliberative processes will be more legitimate than those imposed from above (Plummer & FitzGibbon, 2004; Thompson, 2008), and hence more robust than initiatives relying on enforcement alone (Dryzek, 1987; Jentoft & McCay, 1995). However, to understand the increasing role of citizen participation in governance will require more concerted attention to the cultural politics within deliberative spaces (Fischer, 2006; Irwin, 1995). Political power is often weighted toward government comanagement partners, as they usually make the rules that permit and forbid specific behaviors (Brosius, Tsing, & Zerner, 2005; Nadasdy, 2003). But numerous ethnographic studies suggest that the same institutions that legitimate political or economic domination of one class, gender, or culture can simultaneously and contradictorily create space for opposing discourses and actions (Agrawal, 2005; Li, 2005; Silvern, 1999). For indigenous partners, such opposing discourses and actions transcend natural resource-oriented objectives to broader issues such as affirming identity and establishing social, political, and legal status (Davis & Jentoft, 2001; Korsmo, 1990; Kuper, 2003; Li, 2002; Nursey-Bray, 2006).

Discourses between government and indigenous interests generally remain tightly tied to core beliefs and values (Howitt & Suchet-Pearson, 2006; Morrow & Hensel, 1992; Nadasdy, 2003; Nursey-Bray, 2006; Søreng, 2006; Stevenson, 2006). These values directly affect both the motivations for participation in comanagement and perceptions of success (Lubell, 2003). In some cases, partners also produce and deploy different discourses to describe the same phenomena in the world, what Tsing (2005, p. xi) describes as zones of "awkward engagement where words mean something different across a divide, even where people agree to speak." Thus, Wheatley (2003) expresses concerns about how well the deliberative spaces involving indigenous and Western partners can achieve consensus, which is regarded by some as central to the deliberative process (cf. Jürgen Habermas; Thompson, 2008).

Despite differences in partner goals or the ability to find consensus on specific issues, for comanagement to provide conditions conducive to conserving natural resources, comanagers need to at least find a consensus on how to reconcile "fit." By fit, we mean that the "effectiveness and the robustness of social institutions are

functions of the fit between the institutions themselves and the biophysical and social domains in which they operate" (Young & Underdal, 1997). Institutional fit is now well established as fundamental to natural resource conservation (Cash et al., 2006; Crowder et al., 2006; Folke, Pritchard, Berkes, Colding, & Svedin, 2007; Young, 2002). Without dynamically nurturing fit, comanagement is unlikely to achieve conservation goals. Nursey-Bray and Rist (2009, p. 125) describe this as a need "to reconcile in practice the dialectical choices, [in this case conservation] that comangers embed in their negotiations." However, participation and empowerment toward fostering such objectives as fit will not just happen; there has to be a legitimate process, what Holcombe (1995, p. 21) describes as "a strategy and a set of actions" to accomplish them.

In this paper, our central thesis is that an assessment of the strategy and set of actions framed by comanagement policy—including who deliberated on what, where, and when—is fundamental to understanding what comanagement is and what it might be expected to achieve. When institutional preconditions or rules frame comanagement, they alter collaborative possibilities by providing the structural basis upon which comanagement efforts are built (see also Ebrahim, 2004). We demonstrate that when policies and rules are established without the significant participation of resource users, they lack local relevance and legitimacy, and thus mismatch national and international management priorities with local social and ecological processes. Furthermore, rules imposed through ontological privilege of nonindigenous perspectives can "marginalize and trivialize indigenous perspectives on the relationship between people and place" (Howitt & Suchet-Pearson, 2006, p. 323). Conversely, these same policy contradictions provide the space for agency of indigenous representatives to bolster their own goals of establishing or reaffirming rights to natural resources.

The "closed" deliberative space in current comanagement regimes corresponds to weak policy success, fostering only single-loop learning by removing the active capacity of actors to refine "fit" as both their social and ecological contexts changes (which would require double or triple loop learning; Maarleveld & Dabgbégnon, 1999). By enhancing local participation in framing policy, and not just local representation in management, comangers are more likely to help match the scales<sup>1</sup> of social and ecological processes on the ground with the institutions governing marine mammals and indigenous communities—and thus achieve a better management fit fostering shared conservation goals. This, we demonstrate, requires more flexible and responsive management that involves social learning, where comangers actively look downward rather than just upward within the policy system for cues on how to interpret, institute, and enforce rules.

### **The Political Development of Alaska Native Marine Mammal Comanagement**

During the 1960s, the State of Alaska administered a marine mammal program focused on extensive local involvement and strong commitments by a few biologists (learning local languages and living in communities over long periods); knowledge production encompassing the ecological, social, and economic components of sub-

sistence; and management restraints that fostered conservation. Although preceding the current en-vogue use of comanagement, the State of Alaska's program characterized many of its ideals, deriving benefit from the active participation of indigenous partners in community management while utilizing a mix of top-down and market tools. Consequently, a fairly tight "fit" was initially achieved between wider conservation goals and local social, economic, and ecological needs.

By the 1970s, national values related to the environment and concerns of animal welfare in the United States had become increasingly discordant with marine mammal harvests, either commercially (Young et al., 1994) or for subsistence (Reeves, 2002), leading to increased centralization of management. Debates in the U.S. Congress led to President Nixon's signing of the Marine Mammal Protection Act (MMPA) in 1972, consolidating management from a suite of coastal states to two agencies—U.S. Fish and Wildlife Service (USFWS) and National Marine Fishery Service. The purpose of the MMPA is to conserve marine mammals as significant functional elements of marine ecosystems, which was primarily accomplished through a moratorium on their direct take. The MMPA requires that managers use the best scientific evidence available to guide their decisions with respect to marine mammals.

The MMPA's enactment came two years after President Nixon ended federal "termination" policies toward indigenous cultures that had existed since 1871, replacing them with ones supportive of indigenous self-determination (Nixon, 1970; Silvern, 1999). Accordingly, the MMPA recognized the intrinsic role that marine mammals have played, and continue to play, in subsistence by Alaska Natives, with an exemption to the general moratorium (16 U.S.C. 1371 § 101 [b]):

. . . the provisions of this Act shall not apply with respect to the taking of any marine mammal by any Indian, Aleut, or Eskimo who resides in Alaska and who dwells on the coast of the North Pacific Ocean or the Arctic Ocean if such taking is for subsistence purposes.

Case law supports that Congress intended to balance conservation and indigenous harvests rather than prioritize one over the other (Robards & Joly, 2008). When a species or stock that is subject to taking by Alaska Natives is found to be "depleted"—that is, it falls below the Optimum Sustainable Population—only then may regulations be prescribed on take.<sup>2</sup> However, during the 1970s, the State of Alaska sought to maintain jurisdiction over marine mammals and, for a brief period, was permitted to manage walrus in a quasi comanagement-type relationship with federal agencies. However, the federal government preconditioned this legal relationship with harvest quotas that were deemed too restrictive by both Alaska Natives and the State of Alaska wildlife managers. Consequently, in 1979, the State of Alaska relinquished management authority back to the federal government. Ironically, this extinguished the quotas, which federal agencies were legally unable to self-impose on Alaska Natives.

In 1972, Alaska's Senator Stevens had ensured that Alaska Natives could not only consume marine mammals but could also use them for a limited commercial *handicraft* industry. Stevens stated, "Mr President, if the Native people of my State are denied the right to carve, sew, and utilize fully the entire marine mammal carcass,

the result will be truly disastrous” (118 Congressional Record 25, pp. 259–60). Thus, harvests are legal for subsistence purposes and if

done for the purposes of creating and selling authentic native articles of handicrafts and clothing: Provided, That only authentic native articles of handicrafts and clothing may be sold in interstate commerce: And provided further, That any edible portion of the marine mammals may be sold in native villages and towns in Alaska or for native consumption. For the purposes of this subsection, the term “authentic native articles of handicrafts and clothing” means items composed wholly or in some significant respect of natural materials, and which are produced, decorated, or fashioned in the exercise of traditional native handicrafts without the use of pantographs, multiple carvers, or other mass copying devices. Traditional native handicrafts include, but are not limited to weaving, carving, stitching, sewing, lacing, beading, drawing, and painting; and in each case, is not accomplished in a wasteful manner.

During the 1970s, Alaska Native Organizations formed as advocates for the Alaska Native right to harvest marine mammals and to participate in management of subsistence activities. In 1987, one of these, the Eskimo Walrus Commission, entered into a formal Memorandum of Agreement with the USFWS and Alaska Department of Fish and Game as a precursor to comanagement. By 1994, the House Committee on Merchant Marine Fisheries recognized “that the best way to conserve marine mammal populations in Alaska is to allow *full and equal participation* by Alaska Natives in decisions affecting the management of marine mammals taken for subsistence” (H.R. Report 103–439, p. 39, emphasis added). At that time, USFWS defined full and equal participation in comanagement as “two or more entities, each having *legally* established management responsibility, working together to actively protect, conserve, enhance, or restore fish and wildlife resources” (USFWS, 1994, p. 8; emphasis added). However, 1994 amendments to the MMPA (Section 119) did not establish or recognize legal responsibility toward

1. authorizing any expansion or change in the respective jurisdiction of federal, state, or tribal governments over fish and wildlife resources; or
2. altering in any respect the existing political or legal status of Alaska Natives, or the governmental or jurisdictional status of Alaska Native communities or Alaska Native entities.

In sum, the MMPA frames three primary goals for comanagers: (i) prevent the depletion of marine mammal stocks; (ii) protect the right of Alaska Natives to hunt and use marine mammals, provided it is for subsistence and authentic crafts and is not wasteful; and (iii) encourage shared management responsibility through comanagement. Pacific walrus (*Odobenus rosmarus divergens*) are an ideal contemporary case study of comanagement’s ability to help fit institutions to social-ecological processes in order to accomplish these three goals. First, walrus are expected to decline (Krupnik & Ray, 2007), but establishing if they are depleted is currently not

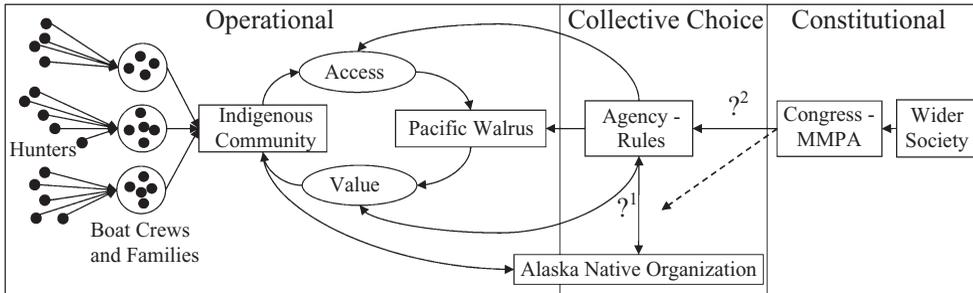
possible (Robards, Burns, Meek, & Watson, 2009; Taylor, Martinez, Gerrodette, Barlow, & Hrovat, 2007), which limits the ability of comanagers to regulate harvests. Second, lack of population estimates hinders assessing if current harvests of walrus by Alaska Natives, which themselves are equivocal, exceed the productivity of the walrus population. Third, lack of harvest management of valuable species such as walrus elsewhere has generally resulted in depletion of stocks. Fourth, as Hajer (2003) suggested, comanagement is a tool to help reduce mismatches between what policy asks and what government institutions can accomplish on their own.

### Theoretical Framework

Walrus are common-pool resources: Once an animal is harvested, fewer animals remain, and exclusion of beneficiaries through physical or institutional means is either impossible or especially costly (Ostrom, Burger, Field, Norgaard, & Policansky, 1999). Under open access, rational choice theory demonstrates that each harvester or group of harvesters receives all benefits from their own exploitation, but costs of that exploitation are shared among all stakeholders (including public wildlife interests). In practice, open access leads to fewer incentives for unilateral harvest restrictions, as those that show restraint incur all the costs of that restraint, while other users share all the benefits. This is a primary theoretical argument against reliance on autonomous community-based approaches when managing wide-ranging common-pool resources (Berkes, 2006). The MMPA's Native exemption and the Section 119 amendment theoretically mirror the collective action needs for conserving common-pool subsistence resources such as marine mammals (Acheson, 2006), first allocating harvest rights (access) to a specific group (Alaska Natives) and second encouraging ownership and responsibility (rule making) through comanagement. Our research question assesses if the legal context now provided by the MMPA encourages such ownership and responsibility.

If federal policy development and interpretation is seen as legitimate by those being governed, it is expected to result in a higher degree of rule compliance (Jentoft, 2000). Thompson (2008, p. 498) describes this as the "reason giving requirement" where "citizens and their representatives are expected to justify the laws they would impose on one another by giving reasons for their political claims and responding to other's reasons in return." To be legitimate, political scientists and social theorists generally assume that management measures such as comanagement must be designed according to prevailing laws, but caution that prevailing laws could themselves be considered illegitimate by those affected (Jentoft, 2000). Participatory approaches involving minorities would thus be expected to provide the greatest legitimacy when they are both deliberated across geopolitical levels from local communities to national governments (Blaikie, 2006) and across socio-cultural levels from indigenous to Western cultures (Wheatley, 2003).

Attending to geopolitical and socio-cultural scales requires a critical view toward what has been called the "incongruence between scales" (Nielsen et al., 2004, p. 158); governments must serve a double obligation of attending to wider public interests (e.g., preserving marine mammals by limiting direct takes) while at the



**Figure 1.** Conceptualization of Decision-Making Levels of Pacific Walrus Comanagement in Alaska Using the Institutional Analysis and Development Framework (Ostrom, 2007).

*Note:* We depict collective choice-level decisions affecting operational-level harvesting rules (access) and rules affecting resource value. Question mark 1 represents uncertainty over the negotiated and legal relationships within the deliberative space of comanagement between a federal agency and Alaska Native Organizations. Question mark 2 represents the contested views as to the discretionary authority that agencies should have to interpret policy. The dashed arrow represents our primary argument: that congressional rules (in this case, the Marine Mammal Protection Act) need to be cointerpreted for successful comanagement that is relevant to communities.

same time allowing full and equal participation of indigenous interests in comanagement of marine mammal subsistence. From a cultural perspective, Wheatley (2003, p. 527) suggests a third deliberative obligation: “[G]iven that the purpose of deliberation is to seek a consensus on minority policies and that self-interested arguments are not permitted, the outcome is likely to be different from the results of the aggregation of individual preferences.” Thus, within the deliberative model, government and indigenous partners are expected to find mutually beneficial compromise rather than solely seeking to manifest their own preferences. We argue that accomplishing this obligation is vital toward achieving fit.

To address the institutional component of our analysis, we delineate three institutional levels using Ostrom’s Institutional Analysis and Development framework: constitutional, collective choice, and operational (Ostrom, 2007; Figure 1). We use these to frame a discussion of how the deliberation of rules occurred in specific places, among specific people, and at specific times, which relates to their potential legitimacy and fit. By rules, we mean the agreed-upon and enforced prescriptions that require, forbid, or permit specific actions (Schlager & Ostrom, 1992). The constitutional-level MMPA defines who is eligible to participate in comanagement (Alaska Native Organizations and federal agencies) and the rules that must be followed by comanagers. The collective choice-level rules established by comanagers are constrained and made predictable by the MMPA. Agencies have what Schlager and Ostrom (1992) term both management and some exclusion rights. Management rights allow interpretation of the MMPA. Exclusion rights (with respect to subsistence harvests) are only provided to agencies when stocks are depleted. Alaska Native Organizations, as we described earlier, do not have legal management rights, providing ambiguity about their “co”-management role (Figure 1). *De jure* rights are agency defined and are likely to be sustained if challenged in an administrative or judicial setting (Schlager & Ostrom,

1992, p. 254). In contrast, Alaska Native Organizations have *de facto* rights based on informal agreement, which we will argue limits the ability of comanagers to respond to changing social, economic, or ecological conditions. It is these higher-order rules (constitutional and collective choice) that provide context for the operational rules that affect the actual hunting and use of marine mammals.

Seeking processes that better fit policy institutions to local processes, Jentoft, McCay, and Wilson (1998) suggest that a focus on the restraining role of institutions negates their potential for enabling and empowering resource users to conserve local resources—a central component of Congress' original vision for comanagement. Likewise, Keane, Jones, Edwards-Jones, and Milner-Gulland (2008), in their review of natural resource management, find that success depends on the ability of managers to influence the behavior of resource users. Agrawal (2005) suggests that participation and empowerment may be nurtured through instilling a sense of ownership and responsibility, tied simultaneously to the resource in question and a system of rules related to those resources. Agrawal's (2005) thesis is that through educating desire, configuring habits, aspirations, and beliefs, governments alter environmental "subjectivities" (what he terms environmentality), and thus shape the conduct of those it wishes to govern.

Through inclusion of the third form of deliberative obligation that we call for above—a multilevel deliberation by comanagers toward mutually beneficial compromise—disparate values related to science and culture may be debated to better inform the reality of the management problem. Fernandez-Gimenez, Hays, Huntington, Andrew, and Goodwin (2008) provides supporting evidence from beluga comanagement in Alaska, where participation and empowerment of hunters may be nurtured through support of local norms rather than exclusively relying on enforced and rigid rules. Where the rules under which comanagement operates do not encourage such participation or empowerment of hunters toward mutual conservation goals (they are mismatched to the scale or level of a problem and do not reflect local realities), we expect outcomes will reflect the "messy, contradictory, multilayered, and conjunctural effects" (Li, 2005, p. 384) of what governance does when fit is ignored.

### Institutional Discourses

In this section we examine deliberations concerning the rules that frame the MMPA's Native exemption, and consequently comanagement. Five key terms are used within these rules, and as we have discussed, if they do not foster fit between what the MMPA asks and the ecological needs of walrus or socio-cultural needs of Alaska Natives, then conservation goals will be hindered. The terms are *Alaska Native*, representing the spatial and cultural scope of legal harvesters; *depleted*, the rule referring to the ecological threshold at which Native hunters lose the right of access to hunt (although they may still be permitted to hunt); *subsistence*, the activity as it relates to the scale of use; *authentic*, a rule that delimits the scale of production of crafts; and *wasteful*, the only harvesting restriction. We present the basis for the interpretations of these rules at constitutional and collective-choice levels—who

deliberated and when, if and what scales or levels are used, and do these rules contribute to improving “fit” with the contemporary operational-level social and ecological domains that they seek to govern.

### *Alaska Native*

The MMPA does not define a coastally residing Alaska Native, leaving USFWS and National Marine Fisheries Service to provide definitions in their 1972 implementing regulations (50 CFR § 18.3 and 50 CFR Ch. II § 216.3, respectively), based on an objective category of race (blood quantum) and on a subjective category of ethnicity (tribal membership):

... a person defined in the Alaska Native Claims Settlement Act (43 U.S.C. section 1603[b] [85 Stat. 588]) as a citizen of the United States who is of one-fourth degree or more Alaska Indian (including Tsimshian Indians enrolled or not enrolled in the Metlaktla Indian Community), Eskimo, or Aleut blood, or combination thereof. The term includes any Native, as so defined, either or both of whose adoptive parents are not Natives. It also includes, in the absence of proof of a minimum blood quantum, any citizen of the United States who is regarded as an Alaska Native by the Native village or town of which he claims to be a member and whose father or mother is (or, if deceased, was) regarded as Native by any Native village or Native town [the term “Native Town” is replaced by “Native group” in the National Marine Fisheries Service regulations]. Any citizen enrolled by the Secretary pursuant to section 5 of the Alaska Native Claims Settlement Act shall be conclusively presumed to be an Alaskan Native for purposes of this part.

The spatial extent of “Alaska Native” harvesters is defined by the jurisdictional scale of Alaska and is different from the spatial extent of walrus distribution. Neither USFWS nor National Marine Fisheries Service specifies the inland boundary of coastal residence. The spatial extent of potential harvesters authorized under the MMPA is limited to Alaska Natives who are U.S. citizens and does not correspond to the spatial extent of harvesters, which include those in neighboring Chukotka (Russian Federation). The spatial boundary of resources and resource use is thus not matched with who the law defines as subjects. Finally, Alaska Natives do not have to reside in the Native villages where they harvest marine mammals or trade in their products. Consequently, because Alaskan tribes cannot enforce regulations on hunters from other tribes, the jurisdiction of Alaska Native’s to enforce local, State of Alaska, or National regulations (the three levels of American Federalism; Silvern, 1999) is not matched to the suite of potential hunters.

### *Depleted*

Coastally residing Alaska Natives usually have open access to nondepleted marine mammals. However, depleted, and in what context a population becomes

depleted (with respect to an optimal sustainable population), like other similar legal terms such as degradation, are “a hybrid blend of physical impacts, social framings and values that reflect the perspectives of more powerful groups” (Forsyth, 2001, p. 149). In 1972, the MMPA (16 U.S.C. 1362 § 3) defined “depletion” or “depleted” as where (i) . . . a species or population stock is below its optimum sustainable population; or (ii) a species or population stock is listed as an endangered species or a threatened species under the Endangered Species Act of 1973. The oversight agency for interpretation of the MMPA, the U.S. Marine Mammal Commission, reported that the use of Optimum Sustainable Population involves *subjective value judgments that are not amenable to quantification on the basis of available data* (Bean & Rowland, 1997).

The political and logistic difficulties of counting walrus throughout their range are significant (Taylor et al., 2007). There has never been an accurate count of the entire walrus population with the last reported population estimate in 2006; confidence in that estimate was low. Currently, the Arctic is undergoing rapid change because of warming and loss of sea ice, which is predicted to reduce the overall population of walrus (Krupnik & Ray, 2007). Thus, both spatial and temporal scales are significant challenges for an assessment of the population’s status. The time required to legally establish depletion and subsequently respond in an effective manner results in what Fay (1979) described as “codified crisis management.” That “depletion” is a fundamental tool in walrus policy under such difficult circumstances disconnects the temporal fit of policy with practical comanagement realities.

### *Subsistence*

In 1972, the MMPA (§109(f)(2)) subjectively defined subsistence as

the customary and traditional uses by rural Alaska residents of marine mammals for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of marine mammals taken for personal or family consumption; and for barter, or sharing for personal or family consumption.

The 1972 implementing regulations of USFWS and National Marine Fisheries Service further define subsistence as the

use by Alaskan Natives of marine mammals taken by Alaskan Natives for food, clothing, shelter, heating, transportation, and other uses necessary to maintain the life of the taker or for [the word “for” is omitted by National Marine Fisheries Service] those who depend upon the taker to provide them with such subsistence.

The definition of “subsistence” has been controversial for decades, based on a suite of subjective interpretations. Subsistence has been based on values (traditional versus modern), racial (Native versus non-Native), social (urban versus rural), the balance between material and cultural components, and whether specific societal segments should be given exclusive or priority access to the harvest and use of

natural resources (Morrow & Hensel, 1992; Schumann & Macinko, 2007). Appropriate levels of subsistence have been defined ecologically, the ability of a stock to support a specific level of harvest; or socially, the perceived appropriateness of that harvest as "subsistence."

Whales, walrus, and seals are different components of a mixed subsistence economy, intermixing with terrestrial species such as reindeer, store-bought foods, and federal aid (*Arctic Human Development Report*, 2004; Krupnik, 1993). If one component is less available because of political or seasonal restrictions in availability, others rise in importance. Subsistence restrictions on walrus would likely lead to increased harvests of alternative species to replace lost sustenance or economic benefits. A single-species focus reduces the fit of management with the ecosystem-based goals of the MMPA and illuminates the complications of dividing subsistence resources across jurisdictions.

### *Authenticity*

The 1972 implementing regulations of USFWS (50 CFR § 18.3) subjectively define Authentic Native articles of handicrafts and clothing as those items that:

(i) are composed wholly or in some significant respect of natural materials; and (ii) are significantly altered from their natural form and are produced, decorated, or fashioned in the exercise of traditional native handicrafts without the use of pantographs, multiple carvers, or similar mass-copying devices. Improved methods of production utilizing modern implements such as sewing machines or modern techniques at a tannery registered pursuant to §18.23(c) may be used so long as no large-scale mass-production industry results. Traditional native handicrafts include, but are not limited to, weaving, carving, stitching, sewing, lacing, beading, drawing, and painting. The formation of traditional native groups, such as cooperatives, is permitted so long as no large-scale mass production results.

National Marine Fisheries Service provide a similar definition in their implementing regulations, although they include the need that Native articles of handicrafts and clothing are those that *were commonly produced on or before December 21, 1972*. Thus, authenticity is subjectively interpreted, based on evaluations of a product's composition, degree of alteration, whether it is suitably traditional, and the level of production. The terms "significantly altered," "traditional," "mass production," and "large scale" are not further defined in either the MMPA or its implementing regulations but express subjective values about the appropriateness of commercialism and modernity in indigenous society. Alaska's USFWS Office of Law Enforcement recently (2007) suggested that "significantly altered" is both "sufficiently/substantially from its natural form" and that work goes into improving the intrinsic value over the natural form.<sup>3</sup> In this case, rules were interpreted in a manner bypassing comanagement. Al Crane (Office of Law Enforcement) had

previously described similar circumstances as “arbitrary prohibitions against people who are trying to maintain a self-sufficient lifestyle, but this is impossible if they abide by the law” (cited in Chambers, 1999: n120).

The use of marine mammal products for crafts for economic gain was intended by the U.S. Congress to protect an extant industry rather than encourage new enterprises and increased economic value. However, the U.S. Congress worried that expansion into new commercial endeavors would be accompanied by greatly increased harvests of marine mammals (Robards & Joly, 2008). Accordingly, federal implementing regulations make reference to the level of production: “[F]ormation of traditional native groups, such as cooperatives, is permitted so long as no large-scale mass production results.” Nevertheless, the level of production within the U.S. Senate’s original intent to support “cottage industries,” while not initiating commercial ventures, remains undefined.

Courts overruled the USFWS authority to regulate harvests based on the authenticity of crafts for nondepleted species because it broadened their regulator authority in a manner that the statute did not permit, thus implying that operational-level harvest rights (access) trump collective choice-level management rights regarding the appropriateness of crafts (Robards & Joly, 2008). As a result, USFWS deleted the 1972 stipulation from their regulations in 2005 (although National Marine Fisheries Service did not do likewise). The court ruling legally disconnects biophysical scales relevant to harvest (i.e., supply) from the social scales relevant to use and demand; thus “authenticity” provides little help in fitting institutions regulating social and commercial practices with walrus or ecosystem considerations mandated by the MMPA. It also provides a poor fit with the needs of communities to adapt to their contemporary circumstances.

### *Wasteful*

Prior to a finding of resource depletion, ensuring harvests are not wasteful is the primary harvest management rule. Without guidance from within the MMPA, USFWS, through their 1972 implementing regulations (50 CFR § 18.3), subjectively defined “wasteful manner” as:

Any taking or method of taking which is likely to result in the killing or injuring of marine mammals beyond those needed for subsistence purposes or for the making of authentic native articles of handicrafts and clothing or which results in the waste of a substantial portion of the marine mammal and includes without limitation the employment of a method of taking which is not likely to assure the capture or killing of a marine mammal, or which is not immediately followed by a reasonable effort to retrieve the marine mammal.

The focus of wasteful is first on retrieval, and then on retention and utilization of enough of the carcass, so that no “substantial portion” is wasted. However, defining nonwasteful by requiring that no “substantial portion” be wasted does not clarify what wastage is. Consequently, the Eskimo Walrus Commission and USFWS’s Office

of Law Enforcement formalized prior informal agreements between hunters and law enforcement agents on what constituted wasteful take of walrus, resulting in the 2004 "Harvest Guidelines" (see details in Robards & Joly, 2008). Nevertheless, the U.S. Department of Justice, the primary authority to appear in court on behalf of the USFWS, concluded in 2005 that the *de facto* Harvest Guidelines allowed for the "waste of nearly the entire carcass of a walrus" and were "exposed . . . as unlawful and . . . no longer operative" (cited in Robards & Joly, 2008).

### Failing to Find Fit in the Comanagement of Pacific Walrus

We have illuminated who, when, and at what scale or level the five key terms defining indigenous marine mammal subsistence were defined and interpreted. The Native exemption protects Alaska Natives from federal regulation prior to stock depletion, resulting in a primary focus on controlling levels of use (ensuring that harvests are for subsistence or authentic crafts and comprise significantly altered parts) and limiting waste rather than rules directly regulating the level of harvest. Therefore, managers try to fit subsistence with what is externally deemed appropriate for coastally residing Alaska Natives, which is not necessarily reflective of their contemporary realities, what is ecologically relevant to walrus, or what is consistent with the best scientific evidence available for attaining a better fit.

While Alaska Natives can harvest nondepleted marine mammals, comanagement is framed by 1972-era rules that negate contemporary feedbacks between hunters and comanagers in a manner supportive of learning and adaptation of policy to improve fit. Alaska Natives do not hold collective choice rights to reinterpret the rules that govern them to reflect current social and ecological realities. Illustrative is the judicial contention over the *de facto* comanagement interpretation of "wasteful." However, without the ability to deliberate values and beliefs in the policy space provided by comanagement, comanagers are unlikely to improve fit between the social and ecological aspects of the walrus social-ecological system.

Below, we document how the current framing of comanagement is unable to (i) match scales relevant to the ecology of walrus with sociopolitical scales relevant to resource users; (ii) monitor marine mammal populations and their ecosystems in a manner supporting management responses to biotic and abiotic changes affecting fit; and (iii) ensure harvest levels fit with the biological capacity of walrus to replenish.

#### *Unifying Ecological and Sociopolitical Scales*

Walrus range widely, crossing jurisdictional boundaries between communities and countries. From a theoretical and practical perspective, current policy supports individual rights of coastally residing Alaska Natives under largely open-access conditions and provides few incentives or rights to encourage collective action toward implementing and enforcing rules throughout the range of walrus. Individuals and communities could act collectively but must weigh the cost/benefits of other communities not complying, including as walrus migrate between Russian and

American waters, or governments intervening in a unilateral rather than comanaged manner if conservation concerns manifest.

The collective action failure to coordinate harvests throughout the range of walrus is exacerbated by global collective action failures to address the warming of the Arctic and the loss of sea ice (*Arctic Climate Impact Assessment*, 2005). Elsewhere, attention to resource harvests that are within an agency's jurisdiction, rather than a focus on interplay with wider ecosystem issues such as habitat, has constrained comanagement's effectiveness (e.g., Ebbin, 2002; Mansfield & Haas, 2006).

### *Effectively Monitoring Pacific Walrus*

When Native subsistence is framed in terms of resource conservation objectives, management challenges can be rendered technical and biological. Alternatively, Native communities may construct the problem as one of access based on "images of who they are and their historical socio-cultural experience" (Armitage, 2008, p. 24). A net loss of Alaska Natives rights after a depletion finding (although subsistence may still be permitted) represents larger social and political struggles between Alaska Natives and the federal government. Furthermore, uncertainty over the future status of the Arctic ecosystem theoretically curbs incentives for communities to reduce harvests of walrus; short-term restraint may not result in long-term payoff (Acheson, 2006). Political uncertainties over ramifications of a depletion finding also provide political value to walrus not being found depleted.

Seeking solutions, Robards et al. (2009) suggest an ecosystem-based approach supporting learning and adaptation to reflect (i) known ecological needs of walrus at specific spatial scales; (ii) observed conditions at those scales; and (iii) predicted changes in the walrus ecosystem. Such a program would require the participation of communities who are more intimately involved with walrus than are most managers and scientists (Krupnik & Ray, 2007; Metcalf & Robards, 2008). However, full participation is unlikely without a meaningful Alaska Native role in problem definition and decision making, as for comanagement of Western Arctic Bowhead whales (*Balaena mysticetus*). Current discrepancies in walrus harvest reporting, evident from comparison with direct observation of harvests or household surveys of resource use, confirm the inability to fit the current suite of MMPA rules with those being used by resource users (Robards & Joly, 2008).

### *Matching Levels of Utilization and Ecological Processes*

Native harvest of walrus is currently regulated through rules precluding waste (i.e., how a walrus is immediately used). Other terms focus on subsequent utilization rather than the level of harvest, mirroring Naughton-Treves's (1999) observation that wild animals are frequently ownerless until killed. Such rules provide little help in resolving mismatches between spatial and temporal scales relevant to walrus, their ecosystems, and subsistence needs.

When subsistence need is conflated with food for survival, it negates social and ideological aspects of the subsistence economy (Morrow & Hensel, 1992), or the

problematic distinction between a mode of survival and one of profit (Schumann & Macinko, 2007). Discourses about subsistence usually reflect values rather than fitting social realities with ecological capacity. Idealized notions of local community in policy do not help fit dynamic social processes with the dynamic capacity of ecosystems to support them (see also Naughton-Treves, 1999). Historically, subsistence harvests of a suite of marine mammal species were above the survival level, providing insurance (rather than profit) for coming months and possibly years, based on uncertainty of future harvests (Krupnik, 1993). Mixed subsistence economies now depend on cash and harvested products, encouraging acquisition of both to buffer future shortfalls. Post-Soviet Chukotka demonstrates the close connection between ecological and economic components of subsistence; the economic collapse of the Soviet system resulted in large migrations of non-Natives out of Chukotka, and increased reliance on subsistence products such as walrus by Native populations (Ainana, 2000).

Congress made the link between economics and the level of harvest and provided language to curb economic incentives to harvest (e.g., no mass production of crafts that must be authentic). However, in doing so Congress mirrored the disempowering and pessimistic vision of the human prospect under Hardin's "Tragedy of the Commons." This scenario has been evoked to rationalize government control and marginalization of indigenous communities, negating the role of local institutions in resolving fit (Ostrom et al., 1999). Alaska Natives have previously curbed exploitation rates based on their self-determined reasoning (Robards & Joly, 2008). Scholars have also demonstrated that commercial end uses in themselves, or improved harvest technology, do not necessarily lead to degradation of resources; rather, overexploitation may be due to a breakdown of key elements of traditional management practices and social relations, when social learning does not lead to new and effective practices (Schumann & Macinko, 2007; Young et al., 1994).

### **Alaska Native Subsistence and Preexisting Comanagement Power Structures**

Despite the MMPA's 1994 amendment encouraging comanagement, absent a finding of depletion, the MMPA and consequently comanagement provide little help in reducing mismatches between policy and social-ecological processes. The original rules provided for Alaska Native subsistence by the MMPA were not originally designed to provide a context supportive of either comanagement or local collective action toward conservation; rather, rules sought to develop a centralized bureaucratic, rather than a governance, approach. The MMPA was written under a social milieu that predates comanagement, reflecting early 1970s Western beliefs and values about marine mammals, ecosystems, and Alaska Natives. Such historical legacies and power inequalities in policymaking have precluded resource sustainability in coastal fisheries elsewhere (e.g., Hauck, 2008).

For vague statutes such as the MMPA, federal agencies have greater discretionary authority in their interpretation (Spicer & Terry, 1996). Consequently, agencies have some *de-jure* constitutional rights, whereby they create meaning in policy, negating the view that comanagement is a collective-choice endeavor. The "judicial

deference" doctrine and the Marine Mammal Commission (a government advisory agency) provide an internal balance on agency interpretation but may still represent values more aligned with resource agencies or congressional culture than the Yup'ik, Siberian Yupik, or Iñupiaq Alaska Native cultures harvesting walrus (Robards & Joly, 2008).

Legal codification of resources in equilibrium and simplistic (e.g., single species) models, rather than acknowledging the complex interrelationships within ecosystems, contributes to the failure of a wide array of natural resource regimes (Cash et al., 2006; Folke, Hahn, Olsson, & Norberg, 2005). Likewise, codification of people and their interrelation with resource systems in equilibrium or simplistic models also contributes to resource management failures. As social processes change, the political context of comanagement may no longer allocate rights and responsibilities in a manner conducive to fit. As we have shown, the "officializing strategies" (Bourdieu, 1977) that are currently used to frame and implement comanagement do not reflect the implied cultural pluralism of Section 119. Nevertheless, the political structure directly translates into contemporary material outcomes for ecosystems supporting marine mammals and the subsistence communities dependent on them.

Alaska Natives and Alaska's Senator Stevens originally framed rights as a unifying issue rather than focusing on specific resource management problems (see also Kuper, 2003; Li, 2002). Indigenous rights were adequate justification for the Native exemption for both comanagement parties—governments supported indigenous self-determination and Alaska Natives gained rights to continue their relationship with marine mammals. However, the right to harvest nondepleted marine mammals under the auspices of historical traditions has reduced temporal geographies of Native community relationships with marine mammals through static notions of subsistence and authenticity.

The MMPA and subsequent rule making by USFWS and National Marine Fisheries Service have established a political structure for Alaska Native marine mammal subsistence, where transgressions are deemed illegal. Agencies generate data to meet objectives supporting that structure. Native hunters, their families, and artisans are expected to live within the law and self-determine their existence. However, a political structure premised on static notions of tradition belies the dynamic social, economic, and ecological pressures under which Alaska Natives exist or of their future aspirations. Under such circumstances, individuals and groups isolated from the direct gaze and access of government officials may benefit by avoiding rules deemed illegitimate or inconsistent with practical needs (Keane et al., 2008). Individual risk taking to accomplish short-term goals is favored by high transaction costs of monitoring and enforcement. Such non-compliant behaviors are reported under similar natural resource circumstances elsewhere, when rules are perceived as illegitimate (e.g., Gezelius, 2004; Triantafillou & Nielsen, 2001). Mismatches between the stated goals of the MMPA and on-the-ground realities confirm the equivocal authority of current agency discourse to conserve marine mammals (e.g., Burn, 1998; Robards & Joly, 2008). These mismatches highlight the inability of current institutions to foster new environmentalities among hunters.

The power of privileged explanation and distortion of indigenous realities have been among the most common tools used by governments to oppress and control indigenous groups (Harding, 2004; Morrow & Hensel, 1992; Nadasdy, 2003; Sardar, 1998). Contemporary imposition of static ecosystem or cultural perspectives in policy may be regarded as hegemonic, where “strategies of ignorance and of knowledge production are central to the assertion of bureaucratic power and rationality” (Mathews, 2005, p. 797). Conversely, the power and rationality of Alaska Natives’ representatives in comanagement regimes may favor the same mechanisms to bolster their own political positions (e.g., maintaining unlimited access to resources). Nevertheless, for any community of hunters to comply with higher-level rules or to develop their own locally appropriate conservation norms through new environmentalities, its members must believe in the legitimacy of those rules or norms, with any legal requirements “embedded in moral discourses, which can be questioned, discussed, and changed” (Søreng, 2006, p. 151, drawing on Jürgen Habermas and Marcel Maus).

Where legal discourses impose restrictions disallowing self-replication of culture, not only is attaining fit constrained, but humiliation of resource users may be a consequence, as their self-determined practices are deemed “futile, obsolete, and powerless” in the modern world (Robbins, 2005, p. 17, drawing on Marshall Sahlins). Loss of cultural continuity under such constraints is discordant with broad policy ideals of environmental justice, rural adaptation, political economy and equity, or indigenous health and welfare (Folke et al., 2005; Lovecraft, 2008; Wexler, 2006). In turn, poor compliance and participation by hunters in monitoring programs limits the effectiveness of agencies, which, although able to accomplish mandated goals (monitoring populations and harvest), are often unable to do so in a conclusive manner that informs legitimate and consequently effective management interventions.

### Enhancing Fit through Meeting Deliberative Obligations

The congressional intent of the MMPA reflects broad social desires to conserve marine mammals and support Alaska Native rights. Comanagement is a technology of government that ideally seeks to “create self-governing and responsible individuals” (Triantafillou & Nielsen, 2001, p. 63). If the political context of comanagement does not foster some degree of self-governance and responsible actions by hunters, we miss the point of comanagement’s practical role in conservation and how it might foster new environmentalities among resource users.

Cultural politics and the signifying practices in which identities, social relations, rules, and rights are contested may continually detract from achieving consensus on resource-oriented goals such as fit (Fischer, 2006; Lee, 1993). But without fit, comanagement is unlikely to conserve resources or support subsistence as a contemporary way of relating to the world. We have argued that to attain natural resource-oriented objectives, comanagement needs to better incorporate pluralistic values—what Gutmann and Thompson (2004, p. 29) call the “pluralist hope”—while avoiding intransigence over values that are incompatible and incommensurable. Such an approach of mutual benefit supports solutions amenable to political, social, and

ecological legitimacy while reducing transaction costs through facilitating norm-based rather than externally imposed rule-based management practices.

We suggest the advent of comanagement in Alaska has only begun a process with the potential to enhance fit across time and changing ecological circumstances. Likewise, in Australia, Nursey-Bray and Rist (2009, p. 126) argue in their review of dugong (*Dugong dugon*) comanagement that continued communication “may enable the parties to further shift their positions leading to an ongoing, working and mutually agreed to comanagement process.” Even though the legal and political context currently govern what is possible within a comanagement agreement, “the negotiations themselves may well push the government authorities into agreeing to something they initially thought was not possible” (Smith, 1996, p. 6). Rist, Chidambaranathan, Escobar, and Wiesmann (2006, p. 220) perceive such deliberative and sometimes agonistic (cf. Mouffe, 1999) arrangements as “emergent systemic societal learning processes.” Walrus comanagement could support new coconstruction of the terms governing Native subsistence in a joint endeavor of problem solving and reflection, thus supporting a more pluralistic deliberative space focused on contemporary conservation and societal needs (see also Aufrecht, 1999; Berkes, 2009; Nursey-Bray, 2006; Rist et al., 2006).

Although opening the deliberative spaces of comanagement policy may benefit fit, we caution that to do so is a double-edged sword and comes with attendant costs and risks. On the one hand, as we have demonstrated, rule changes are necessary in terms of how climate change and other socioeconomic factors will affect Pacific walrus and Alaska Natives in the coming decades. On the other hand, such rule changes will be made publicly and thus carry a risk that the majority will not understand, and or agree with Alaska Natives about what are the “right” sorts of rules. If the majority does not accept new rules or seeks increased constraints on the harvest or use of marine mammals, this could not only reflect the functioning of the democratic process but also could be a further move of the majority to “assimilate” indigenous peoples. Alternatively, a mechanism that is not open to the public would protect the special status of indigenous peoples but would reduce the democratic process contributing to natural resource policy.

Finding tangency among indigenous peoples and Western governments will always be dynamic and contested. Nevertheless, in order to achieve mutually beneficial conservation goals, comanagement partners will need to dispel some of the traditional assumptions inherent in policy that are discordant with learning to fit social, economic, and ecological processes with governance institutions in a pluralistic policy arena. As a starting point (drawing from Hauck, 2008), deliberations might move away from asking how do we increase compliance with current rules that are mismatched to contemporary needs, and ask how do we improve fit. By doing so, deliberative spaces may better support governance in the context of both mutual desires for conservation and incompatible and incommensurable values with respect to the appropriate relationship between Alaska Natives and marine mammals.

**Martin David Robards** completed his PhD, including the research presented here with the Department of Biology & Wildlife, University of Alaska Fairbanks, P.O. Box

751121, Fairbanks, AK 99775–1121, USA. He is currently completing a National Research Council Post-Doctoral Fellowship at the U.S. Marine Mammal Commission, 4340 East-West Highway, Room 700, Bethesda, MD 20814. His research interests include community-based management approaches including comanagement, particularly focused on marine mammals and indigenous groups. E-mail: martin\_robards@yahoo.com

**Amy Lauren Lovecraft** is an Associate Professor and Chair of the Department of Political Science, University of Alaska Fairbanks, P.O. Box 756420, Fairbanks, AK 99775-6420, USA. Her research interests include localized international (interlocal) institutions for natural resource governance and the connections between science and politics in environmental policymaking. E-mail: alovecraft@alaska.edu

## Notes

We thank Drs. Chapin, Kitaysky, Meek, Schweitzer, Sutaria, and Watson for reviews of earlier drafts. Comments from anonymous reviewers provided substantial help in focusing our arguments. The research was partly funded through a grant from the National Park Service's Beringia Program. MDR worked with the Alaska Eskimo Walrus Commission as part of his PhD research and is currently supported by the U.S. Marine Mammal Commission; however, the views expressed in this paper are those of the authors alone.

1. Following Cash et al. (2006), scale is "the spatial, temporal, quantitative, or analytical dimensions used to measure and study any phenomenon," and levels are "the units of analysis that are located at different positions on a scale."
2. A species or population stock of marine mammals may also be considered depleted if it is listed under the U.S. Endangered Species Act.
3. Letter from the Office of Law Enforcement to Dineega Specialty Furs with respect to sea otter pelts on 10/11/07; on file with author.

## References

- Acheson, James M. 2006. "Institutional Failure in Resource Management." *Annual Review of Anthropology* 35: 117–34.
- Agrawal, Arun. 2005. *Environmentality: Technologies of Government and the Making of Subjects*. Durham, NC: Duke University Press.
- Ainana, Liudmila. 2000. *Preservation and Development of the Subsistence Lifestyle and Traditional Use of Natural Resources by Native People (Eskimo and Chukchi) in Selected Coastal Communities (Inchoun, Uelen, Lorino, Lavrentiya, Novoye Chaplino, Sireniki, Nunligran, Enmelen) of Chukotka in the Russian Far East during 1998*. Anchorage, AK: National Park Service.
- Arctic Climate Impact Assessment*. 2005. Cambridge: Cambridge University Press.
- Arctic Human Development Report*. 2004. Akureyri, Iceland: Stefansson Arctic Institute.
- Armitage, Derek. 2008. "Governance and the Commons in a Multi-Level World." *International Journal of the Commons* 2 (1): 7–32.
- Aufrecht, Steven E. 1999. "Missing: Native American Governance in American Public Administration Literature." *American Review of Public Administration* 29 (4): 370–90.
- Bean, Michael J., and Melanie J. Rowland. 1997. *The Evolution of National Wildlife Law*, 3rd ed. Westport, CT: Praeger.
- Berkes, Fikret. 2006. "From Community-Based Resource Management to Complex Systems." *Ecology and Society* 11 (1): 45. <http://www.ecologyandsociety.org/vol11/iss1/art45/>. Accessed March 16, 2010.
- . 2009. "Evolution of Co-Management: Role of Knowledge Generation, Bridging Organizations and Social Learning." *Journal of Environmental Management* 90: 1692–702.

- Blaikie, Piers. 2006. "Is Small Really Beautiful? Community-Based Natural Resource Management in Malawi and Botswana." *World Development* 34 (11): 1942–57.
- Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.
- Brosius, J. Peter, Anna L. Tsing, and Charles Zerner. 2005. *Communities and Conservation: Histories and Politics of Community-Based Natural Resource Management*. Walnut Creek, CA: AltaMira Press.
- Burn, Douglas M. 1998. "Estimation of Hunter Compliance with the Marine Mammal Marking, Tagging, and Reporting Program for Walrus." *Wildlife Society Bulletin* 26 (1): 68–74.
- Cash, David W., W. Neil Adger, Fikret Berkes, Po Garden, Louis Lebel, Per Olsson, Lowell Pritchard, and Oran Young. 2006. "Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World." *Ecology and Society* 11 (2): 8. <http://www.ecologyandsociety.org/vol11/iss2/art8/>. Accessed March 16, 2010.
- Chambers, Joseph J. 1999. *Co-Management of Walrus in Alaska: The Eskimo Walrus Commission and the U.S. Fish and Wildlife Service*. Unpublished diss., University of Alaska, Fairbanks.
- Crowder, Larry B., Gail Osherenko, Oran R. Young, Satie Aïramé, Elliot A. Norse, Nancy Baron, John C. Day, Fanny Douvère, Charles N. Ehler, Benjamin S. Halpern, Steve J. Langdon, Karen L. McLeod, John C. Ogden, Robbin E. Peach, Andrew A. Rosenberg, and James A. Wilson. 2006. "Resolving Mismatches in U.S. Ocean Governance." *Science* 313 (5787): 617–18.
- Davis, Anthony, and Svein Jentoft. 2001. "The Challenge and the Promise of Indigenous Peoples' Fishing Rights—From Dependency to Agency." *Marine Policy* 25: 223–37.
- Dryzek, John S. 1987. "Discursive Designs: Critical Theory and Political Institutions." *American Journal of Political Science* 31 (3): 656–79.
- Ebbin, Syma A. 2002. "Enhanced Fit through Institutional Interplay in the Pacific Northwest Salmon Co-Management Regime." *Marine Policy* 26: 253–59.
- Ebrahim, Alnoor. 2004. "Institutional Preconditions to Collaboration: Indian Forest and Irrigation Policy in Historical Perspective." *Administration & Society* 36 (2): 208–42.
- Fay, Francis H. 1979. "Marine Mammals." *Alaska Conservation Review* 1: 5.
- Fernandez-Gimenez, Maria E., John U. Hays, Henry P. Huntington, Regis Andrew, and Willie Goodwin. 2008. "Ambivalence toward Formalizing Customary Resource Management Norms among Alaska Native Beluga Whale Hunters and Tohono O'odham Livestock Owners." *Human Organization* 67 (2): 137–50.
- Fischer, Frank. 2006. "Participatory Governance as Deliberative Empowerment: The Cultural Politics of Discursive Space." *American Review of Public Administration* 36 (1): 19–40.
- Folke, Carl, Thomas Hahn, Per Olsson, and Jon Norberg. 2005. "Adaptive Governance of Social-Ecological Systems." *Annual Review of Environment and Resources* 30: 441–73.
- Folke, C., L. Pritchard, F. Berkes, J. Colding, and U. Svedin. 2007. "The Problem of Fit between Ecosystems and Institutions: Ten Years Later." *Ecology and Society* 12 (1): 30. <http://www.ecologyandsociety.org/vol12/iss1/art30/>. Accessed March 16, 2010.
- Forsyth, Tim. 2001. "Critical Realism and Political Ecology." In *After Postmodernism: Critical Realism?* ed. Jose Lopez and Garry Potter. London: Athlone Press, 146–54.
- Gezelius, Stig S. 2004. "Food, Money, and Morals: Compliance among Natural Resource Harvesters." *Human Ecology* 32 (5): 615–34.
- Gutmann, Amy, and Dennis F. Thompson. 1996. *Democracy and Disagreement*. Cambridge, MA: Harvard University Press.
- . 2004. *Why Deliberative Democracy*. Princeton, NJ: Princeton University Press.
- Hajer, Maarten. 2003. "Policy without Polity: Policy Analysis and the Institutional Void." *Policy Sciences* 36 (2): 175–95.
- Harding, Sandra. 2004. "Rethinking Standpoint Epistemology: What Is 'Strong Objectivity'?" In *The Feminist Standpoint Theory Reader: Intellectual and Political Controversies*, ed. Sandra Harding. New York: Routledge, 127–40.
- Hauck, Maria. 2008. "Rethinking Small-Scale Fisheries Compliance." *Marine Policy* 32: 635–42.

- Holcombe, Susan. 1995. *Managing to Empower: The Grameen Bank's Experience of Poverty Alleviation*. London: Zed Books.
- Howitt, Richard, and Sandra Suchet-Pearson. 2006. "Rethinking the Building Blocks: Ontological Pluralism and the Idea of 'Management'." *Geografiska Annaler, Series B: Human Geography* 88 (3): 323–35.
- Irwin, Alan. 1995. *Citizen Science: A Study of People, Expertise, and Sustainable Development*. New York: Routledge.
- Jentoft, Svein. 2000. "Legitimacy and Disappointment in Fisheries Management." *Marine Policy* 24 (2): 141–48.
- Jentoft, Svein, and Bonnie J. McCay. 1995. "User Participation in Fisheries Management." *Marine Policy* 19: 227–46.
- Jentoft, Svein, Bonnie J. McCay, and Douglas C. Wilson. 1998. "Social Theory and Fisheries Co-Management." *Marine Policy* 22: 423–36.
- Keane, Aidan, Julia P.G. Jones, Gareth Edwards-Jones, and E.J. Milner-Gulland. 2008. "The Sleeping Policeman: Understanding Issues of Enforcement and Compliance in Conservation." *Animal Conservation* 11: 75–82.
- Kellert, Stephen R., Jai N. Mehta, Syma A. Ebbin, and Laly L. Lichtenfeld. 2000. "Community Natural Resource Management: Promise, Rhetoric and Reality." *Society and Natural Resources* 13: 705–15.
- Koontz, Tomas M., and Craig W. Thomas. 2006. "What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management?" *Public Administration Review* 66 (6): 111–21.
- Korsmo, Fae L. 1990. "Problem Definition and the Alaska Natives: Ethnic Identity and Policy Formation." *Policy Studies Review* 9 (2): 294–306.
- Krupnik, Igor. 1993. *Arctic Adaptations: Native Whalers and Reindeer Herders of Northern Eurasia*. Hanover, NH: University Press of New England.
- Krupnik, Igor, and G. Carleton Ray. 2007. "Pacific Walrus, Indigenous Hunters, and Climate Change: Bridging Scientific and Indigenous Knowledge." *Deep-Sea Research II* 54: 2946–57.
- Kuper, Adam. 2003. "The Return of the Native." *Current Anthropology* 44 (3): 389–402.
- Lee, Kai N. 1993. "Greed, Scale Mismatch, and Learning." *Ecological Applications* 3 (4): 560–64.
- Li, Tania M. 2002. "Engaging Simplifications: Community-Based Resource Management, Market Processes and State Agendas in Upland Southeast Asia." *World Development* 30 (2): 265–83.
- . 2005. "Beyond 'the State' and Failed Schemes." *American Anthropologist* 107 (3): 383–94.
- Lovecraft, Amy L. 2008. "Climate Change and Arctic Cases: A Normative Exploration of Social-Ecological System Analysis." In *Political Theory & Global Climate Change*, ed. Steve Vanderheiden. Cambridge, MA: MIT Press, 91–120.
- Lubell, Mark. 2003. "Collaborative Institutions, Belief-Systems, and Perceived Policy Effectiveness." *Political Research Quarterly* 56 (3): 309–23.
- Maarleveld, Marleen, and Constant Dabgbégnon. 1999. "Managing Natural Resources: A Social Learning Perspective." *Agriculture and Human Values* 16 (3): 267–80.
- Mansfield, Becky, and Johanna Haas. 2006. "Scale Framing of Scientific Uncertainty in Controversy over the Endangered Steller Sea Lion." *Environmental Politics* 15 (1): 78–94.
- Mathews, Andrew S. 2005. "Power/Knowledge, Power/Ignorance: Forest Fires and the State of Mexico." *Human Ecology* 33 (6): 795–820.
- Metcalf, Vera, and Martin D. Robards. 2008. "Sustaining a Healthy Human–Walrus Relationship in a Dynamic Environment: Challenges for Comanagement." *Ecological Applications* 18 (2): S148–56.
- Morrow, Phyllis, and Chase Hensel. 1992. "Hidden Dissension: Minority–Majority Relationships and the Use of Contested Terminology." *Arctic Anthropology* 29 (1): 38–53.
- Mouffe, Chantal. 1999. "Deliberative Democracy or Agonistic Pluralism?" *Social Research* 66: 745–58.
- Nadasdy, Paul. 2003. *Hunters and Bureaucrats: Power, Knowledge, and Aboriginal–State Relations in the Southwest Yukon*. Vancouver: UBC Press.

- Naughton-Treves, Lisa. 1999. "Whose Animals? A History of Property Rights to Wildlife in Toro, Western Uganda." *Land Degradation and Development* 10: 311–28.
- Nielsen, Jesper R., Poul Degnbol, K. Kuperan Viswanathan, Mahfuzuddin Ahmed, Mafaniso Hara, and Nik M.R. Abdullah. 2004. "Fisheries Co-Management—An Institutional Innovation? Lessons from South East Asia and Southern Africa." *Marine Policy* 28: 151–60.
- Nixon, Richard. 1970. "Public Papers of the Presidents of the United States: Richard Nixon, 1970." Washington, DC: United States Government Printing Office, 564–76.
- Nursey-Bray, Melissa. 2006. *Conflict to Co-Management: Eating Our Words: Towards Socially Just Conservation of Green Turtles and Dugongs in the Great Barrier Reef, Australia*. PhD diss., James Cook University.
- Nursey-Bray, Melissa, and Phillip Rist. 2009. "Co-Management and Protected Area Management: Achieving Effective Management of a Contested Site, Lessons from the Great Barrier Reef World Heritage Area (GBRWHA)." *Marine Policy* 33 (1): 118–27.
- Ostrom, Elinor. 2007. "Institutional Rational Choice: An Assessment of the Institutional Analysis and Development Framework." In *Theories of the Policy Process*, ed. Paul A. Sabatier. Boulder, CO: Westview Press, 35–71.
- Ostrom, Elinor, Joanna Burger, Christopher B. Field, Richard B. Norgaard, and David Policansky. 1999. "Revisiting the Commons: Local Lessons, Global Challenges." *Science* 284: 278–82.
- Pinkerton, Evelyn. 2003. "Toward Specificity in Complexity: Understanding Co-Management from a Social Science Perspective." In *The Fisheries Co-Management Experience: Accomplishments, Challenges and Prospects*, ed. Douglas C. Wilson, Jesper R. Nielsen, and Poul Degnbol. Dordrecht, The Netherlands: Kluwer Academic Publishers, 61–77.
- Plummer, Ryan, and John FitzGibbon. 2004. "Co-Management of Natural Resources: A Proposed Framework." *Environmental Management* 33 (6): 876–85.
- Reeves, Randall R. 2002. "The Origins and Character of 'Aboriginal Subsistence' Whaling: A Global Review." *Mammal Review* 31 (2): 71–106.
- Rist, Stephan, Mani Chiddambaranathan, Cesar Escobar, and Urs Wiesmann. 2006. "'It was Hard to Come to Mutual Understanding . . .':—The Multidimensionality of Social Learning Processes Concerned with Sustainable Natural Resource Use in India, Africa, and Latin America." *Systemic Practice and Action Research* 19 (3): 219–37.
- Robards, Martin D., and Julie L. Joly. 2008. "Interpretation of 'Wasteful Manner' within the Marine Mammal Protection Act and Its Role in Management of the Pacific Walrus." *Ocean and Coastal Law Journal* 13 (2): 171–232.
- Robards, Martin D., John J. Burns, Chanda L. Meek, and Annette Watson. 2009. "Limitations of an Optimum Sustainable Population or Potential Biological Removal Approach for Conserving Marine Mammals: Pacific Walrus Case Study." *Journal of Environmental Management* 91: 57–66.
- Robbins, Joel. 2005. "Humiliation and Transformation: Marshall Sahlins and the Study of Cultural Change in Melanesia." In *The Making of Global and Local Modernities in Melanesia: Humiliation, Transformation, and the Nature of Cultural Change*, ed. Joel Robbins and Holly Wardlow. Williston, VT: Ashgate Publishing, 3–21.
- Sandström, Camilla. 2009. "Institutional Dimensions of Comanagement: Participation, Power, and Process." *Society and Natural Resources* 22: 230–44.
- Sardar, Ziauddin. 1998. *Postmodernism and the Other: The New Imperialism of Western Culture*. London: Pluto Press.
- Schumann, Sarah, and Seth Macinko. 2007. "Subsistence in Coastal Fisheries Policy: What's in a Word?" *Marine Policy* 31 (6): 706–18.
- Schlager, Edella, and Elinor Ostrom. 1992. "Property-Rights Regimes and Natural Resources: A Conceptual Analysis." *Land Economics* 68 (3): 249–62.
- Silvern, Steven E. 1999. "Scales of Justice: Law, American Indian Treaty Rights and the Political Construction of Scale." *Political Geography* 18 (6): 639–68.
- Smith, Eric. 1996. "Some Thoughts on Comanagement." *Hastings West-Northwest Journal of Environmental Law* 4 (1): 1–9.

- Søreng, Siri U. 2006. "Moral Discourse in Fisheries Co-Management: A Case Study of the Senja Fishery, Northern Norway." *Ocean and Coastal Management* 49: 147–63.
- Spicer, Michael W., and Larry C. Terry. 1996. "Administrative Interpretation of Statutes: A Constitutional View of the 'New World Order' of Public Administration." *Public Administration Review* 56 (1): 38–47.
- Stevenson, Marc G. 2006. "The Possibility of Difference: Rethinking Co-Management." *Human Organization* 65 (2): 167–80.
- Taylor, Barbara L., Melissa Martinez, Tim Gerrodette, Jay Barlow, and Yvana N. Hrovat. 2007. "Lessons from Monitoring Trends in Abundance of Marine Mammals." *Marine Mammal Science* 23 (1): 157–75.
- Thompson, Dennis F. 2008. "Deliberative Democratic Theory and Empirical Political Science." *The Annual Review of Political Science* 11: 497–520.
- Triantafillou, Peter, and Mikkel R. Nielsen. 2001. "Policing Empowerment: The Making of Capable Subjects." *History of Human Sciences* 14 (2): 63–86.
- Tsing, Anna L. 2005. *Friction: An Ethnography of Global Connection*. Princeton, NJ: Princeton University Press.
- USFWS (U.S. Fish and Wildlife Service). 1994. *The Native American Policy of the U.S. Fish and Wildlife Service*. Washington, DC: Department of the Interior.
- Wexler, Lisa M. 2006. "Inupiat Youth Suicide and Culture Loss: Changing Community Conversations for Prevention." *Social Science and Medicine* 63 (11): 2938–48.
- Wheatley, Steven. 2003. "Deliberative Democracy and Minorities." *European Journal of International Law* 14 (3): 507–27.
- Young, Oran R. 2002. *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale*. Cambridge, MA: MIT Press.
- Young, Oran R., and Arild Underdal. 1997. "Institutional Dimensions of Global Change." IHDP Scoping Report. International Human Dimensions Programme on Global Environmental Change, Bonn, Germany.
- Young, Oran R., Milton M. R. Freeman, Gail Osherenko, Raoul R. Andersen, Robert L. Caulfield, Robert L. Friedheim, Steve J. Langdon, Mats Ris, and Peter J. Usher. 1994. "Subsistence, Sustainability, and Sea Mammals: Reconstructing the International Whaling Regime." *Ocean and Coastal Management* 23 (1): 117–27.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.