COLLABORATIVE STRATEGIES FOR MANAGING ANIMAL MIGRATIONS: INSIGHTS FROM THE HISTORY OF ECOSYSTEM-BASED MANAGEMENT

BY

STEVEN L. YAFFEE*

Twenty years of experience with collaborative ecosystem-based management (EBM) provides insights that can be applied to the management of animal migrations. Since the principles underlying EBM are the same as those informing migration conservation, and they exhibit many of the same challenges, it is reasonable to presume that factors that have facilitated progress in EBM will be helpful in migration conservation. These include factors related to motivation, organization, resources, adaptability, legitimacy, and energy that create the incentives and capacity to carry out landscape-scale collaborative action to secure migratory corridors. The EBM experience also suggests that these factors are best considered as elements of a dynamic project lifecycle that calls for different strategies at varying points of time. Less demanding social outcomes, such as communication, precede more complex ones, such as trust, and procedural and social improvements often precede ecological change. While collaborative action is almost by definition voluntary, in fact, collaborative EBM exists within an incentive structure that promotes joint decision making and action. Legal mandates such as the Endangered Species Act form part of this incentive structure. Well-managed collaborative processes can be effective at finding creative, win–win type strategies when given a credible goal with the space to invent solutions and the incentives to do so.

* Professor of Natural Resource and Environmental Policy and Director, Ecosystem Management Initiative, School of Natural Resources and Environment, University of Michigan. I want to thank Professor Robert Fischman for his invitation to participate in the migration conservation symposium that gave rise to these papers. I appreciate his comments on my draft manuscript, along with those of Elizabeth Baldwin. I also want to acknowledge the contributions of my colleagues, Julia Wondolleck and Sheila Schueller, whose collaborative research has helped shape the ideas about the factors that promote successful ecosystem management contained in this article.

I. INTRODUCTION

Over the last two decades, efforts to conserve large landscapes in North America have involved scientists, managers, policy makers, and a range of nongovernmental stakeholders in a variety of collaborative processes. Sometimes called ecosystem-based management (EBM),[1] these efforts have attempted to manage at larger, more ecologically-relevant scales than traditionally was the case in terrestrial, freshwater, and marine systems. Because these efforts have important similarities to migration conservation, they can be viewed as a suite of experiments that can inform the development of collaborative arrangements for managing wide-ranging animal species.

[1] The terms ecosystem-based management and ecosystem management generally refer to a more holistic and place-based style of natural resource decision making. *See* Norman L. Christensen et al., *The Report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management*, 6 ECOLOGICAL APPLICATIONS 665, 668–69 (1996) (providing a commonly cited definition of EBM in terrestrial systems); *see also* COMMC'N P'SHIP FOR SCI. & THE SEA, SCIENTIFIC CONSENSUS STATEMENT ON MARINE ECOSYSTEM-BASED MANAGEMENT (2005), *available at* http://doc.nprb.org/web/BSIERP/EBM%20scientific%20statement.pdf (providing a common-cited definition of EBM in marine systems endorsed by 217 academic scientists and policy experts with relevant expertise). For descriptions of common features in multiple definitions of EBM, see R. Edward Grumbine, *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 28–31 (1994) and Steven L. Yaffee, *Three Faces of Ecosystem Management*, 13 CONSERVATION BIOLOGY 713, 715 (1999). *See also infra* Part II.

This Article describes lessons that have emerged from these EBM efforts, highlighting the challenges that people have faced and the factors that seem to account for success. Given a pluralistic political system and a land base that is fragmented among multiple public and private owners, future strategies must be collaborative while still creating the incentives for the collaboration to yield conservation outcomes. How can this be done?

Part II identifies the key principles of EBM and how they relate to emerging principles of migration conservation, noting strong similarities of the two approaches. Both EBM and migration conservation involve management at larger spatial scales and longer and more sophisticated temporal scales. They focus on maintenance or restoration of key ecosystem processes (such as disturbance and migratory movement), not just the structural components of ecosystems (such as species and communities). Larger scales and more complex management strategies require cooperation and collaboration across boundaries and force decision makers to include more stakeholders in management decisions. To deal effectively with uncertainty and change, such as the potential impacts of climate change on habitat quality and migration behavior, adaptive management is needed to ensure ongoing learning and wiser strategic choices.

Part III summarizes the challenges that have faced individuals attempting to implement EBM projects and examines the limited evidence of challenges associated with cases of migration conservation. These challenges include: institutional and political barriers due to conflicting agency missions and competing demands for resources; attitudinal issues due to mistrust and conflicting cultures; and process management difficulties associated with complex, multiparty decision-making processes.

Since the principles and challenges of EBM and migration conservation appear similar, there is reason to believe that the factors promoting success in EBM efforts will help to promote similar migration conservation efforts, and Part IV summarizes these factors based on numerous case studies of EBM projects. These include factors that create motivation and momentum; structures that help to organize efforts effectively; and ways to access resources that help projects secure scientific information, manage processes efficiently, and create the potential for successes that in turn help to sustain collaborative efforts. EBM efforts also benefitted from evaluation and joint learning that promoted adaptability; legitimacy provided by involvement, accountability, and follow-through; and energy provided by key individuals or process champions.

Key to understanding EBM success—and hence the potential for migration conservation success—is that these efforts generally require sustained effort over relatively long periods of time. Studies of EBM projects suggest that they progress through a somewhat predictable life cycle, where strategies and outcomes tend to occur in iterative patterns. Part V presents a rough lifecycle model of EBM projects drawing on experience with more than twenty years of history of a number of EBM efforts. By understanding the dynamic nature of these processes, managers can better participate in and facilitate them, and policy makers can learn what they can expect from these processes and how policies can help produce conservation outcomes by assisting these processes at key points in time.

Finally, the collaborative, often extra-level, nature of these protection efforts raise questions about how they are accountable to statutory direction and how legal inducements relate to effective collaboration. In Part VI, I argue that well-managed collaborative processes usually benefit from legal and scientific boundaries that define the decision space onto which creative multiparty attention can be placed. Hence, a legal mandate to protect migrations is not at all at odds with a landscape-scale protection strategy that relies on collaborative action. At bottom, collaborative action for migration conservation needs to be incentivized and well-informed while giving the space and process skills to find solutions.

II. ECOSYSTEM-BASED MANAGEMENT AND MIGRATION CONSERVATION

EBM developed in the early- to mid-1990s as a way out of crises caused by a set of stalemated endangered species and public lands conflicts, and a mechanism for incorporating new landscape-scale understanding of ecosystem science.[2]

A. Spatial Scale and Complex Systems in EBM

EBM called for expanding the spatial and temporal scale of planning and management with managers considering ecologically-relevant boundaries, such as landscape ecosystems or marine spatial units, rather than traditional administrative or political boundaries.[3] Instead of simplifying systems to promote industrial-scale production of single species, such as fish or trees, EBM embraced complexity and highlighted the need to protect critical ecosystem processes as a way to ensure the health of ecosystem components, including plant and animal species. Managers

---

[2] Grumbine, *supra* note 1, at 28–29; GARY K. MEFFE ET AL., ECOSYSTEM MANAGEMENT: ADAPTIVE COMMUNITY-BASED CONSERVATION 58–60 (2002) (discussing the transition from traditional management to ecosystem management); STEVEN LEWIS YAFFEE, THE WISDOM OF THE SPOTTED OWL: POLICY LESSONS FOR A NEW CENTURY 157 (1994).

[3] In the terrestrial realm, ecological problems associated with management by administrative boundaries are well-described. Peter B. Landres et al., *Ecological Effects of Administrative Boundaries*, *in* STEWARDSHIP ACROSS BOUNDARIES 39, 39–64 (Richard L. Knight & Peter B. Landres eds., 1998). In the marine realm, fragmented administrative decision making has similarly been identified as a problem for natural resource management. *See* U.S. COMM'N ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 5–10 (2004), *available at* http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/6857/ocean_full_report.pdf?sequence=1. Multiple management strategies have been attempted to promote ecosystem-scale collaboration. The most recent efforts can be seen in concepts promoted by the U.S. Department of the Interior to deal with climate change as landscape conservation cooperatives. U.S. DEP'T OF THE INTERIOR, SEC'Y ORDER NO. 3289, ADDRESSING THE IMPACTS OF CLIMATE CHANGE ON AMERICA'S WATER, LAND, AND OTHER NATURAL AND CULTURAL RESOURCES (2009), *available at* http://elips.doi.gov/app_so/act_getfiles.cfm?order_number=3289. In the marine realm, ecosystem-scale planning is required. Exec. Order No. 13,547, 75 Fed. Reg. 43,023, 43,023–24 (Jul. 22, 2010).

sought to incorporate more variables critical to the integrity of the system including disturbances, such as fire, and variability, such as fluctuations in hydrologic flow.[4] Overall, management aimed at finding balance among the demands of different user groups in a way that maintained or restored ecosystem integrity.

B. Collaboration and Adaptation in EBM

To accomplish larger scale, longer term, and more complex management regimes, EBM called for collaboration and adaptive management.[5] To achieve adequate scientific understanding, multiple scientists, agency managers, and nongovernmental parties were needed to pool information and participate in dialogue.[6] Since larger and more complex landscapes involved a mix of ownerships, interagency cooperation was needed to manage across geographic boundaries.[7] Often the broader set of public and private values involved in larger landscapes required decision makers to provide a place at the table for a larger set of affected and interested parties.[8] Finally, while traditional management tended to provide assurance through often erroneous images of certainty and predictability, EBM embraced adaptive management as a mechanism to deal with

---

4 Traditional management tended to simplify systems. Forest management aimed at plantations of monocultures; river management emphasized engineering solutions to control downstream risk. *See, e.g.*, MEFFE ET AL., *supra* note 2, at 61–66. EBM recognized that simplification strategies resulted in losses of biodiversity and reduced resilience, as fire-dependent species and old-growth ecosystems declined and aquatic species declined as rivers were simplified and decoupled from their landscapes. *See id.* at 62, 64 (explaining that fire suppression techniques involve reducing variation within an ecosystem).

5 *See, e.g.*, JULIA M. WONDOLLECK & STEVEN L. YAFFEE, MAKING COLLABORATION WORK: LESSONS FROM INNOVATION IN NATURAL RESOURCE MANAGEMENT 26–45 (2000) (citing multiple examples of ongoing collaborations in ecosystem management); STEVEN L. YAFFEE ET AL., ECOSYSTEM MANAGEMENT IN THE UNITED STATES: AN ASSESSMENT OF CURRENT EXPERIENCE 293–303 (1996) (providing a state-by-state list of 619 ecosystem management projects).

6 The Albemarle-Pamlico Estuarine Study, which focuses on Albemarle Sound and Pamlico Sound in eastern North Carolina, provides an example of a science-based collaborative management process on the ecosystem scale. *See* THOMAS M. KOONTZ ET AL., COLLABORATIVE ENVIRONMENTAL MANAGEMENT: WHAT ROLES FOR GOVERNMENT? 103–25 (2004). While scientific collaboration has not been enough to overcome key conflicts among stakeholders, the process has served as a foundation for information sharing and a platform for conflict resolution. *See id.* at 123–24 (explaining that the Albemarle-Pamlico Estuarine Study led to new governmental networks, better communication, and several new, coordinated programs).

7 An interagency partnership arrangement is at the heart of the cooperative management structure for the Elkhorn Mountains in Montana, with a memorandum of understanding and a cross-ownership area coordinator shared by the U.S. Department of Agriculture's Forest Service, the U.S. Bureau of Land Management, and the Montana Department of Fish, Wildlife, and Parks. *See* WONDOLLECK & YAFFEE, *supra* note 5, at 87–88.

8 For example, the Animas River Stakeholder Group was initiated by the Colorado Water Quality Control Division to engage stakeholders in a watershed-scale joint problem-solving effort as an alternative to a more traditional top-down regulatory strategy. KOONTZ ET AL., *supra* note 6, at 129–30. The effort greatly expanded the number of groups involved in negotiating a decision. *Id.* at 130–31.

uncertainty and the inevitability of unplanned change.[9] In the best of cases, managers viewed decision making as a process of experimentation: strategies were explicitly linked to outcomes and their impact monitored, with results providing the basis for learning and adaptive change.[10]

As management principles, EBM's focus on scale, complexity, ecosystem health, collaboration, and adaptive management are hard to dispute, and management in a number of places shifted from a single-species focus on commodity production to a more balanced emphasis on satisfying multiple demands while raising the priority of ecosystem integrity.[11] Ecological processes were more likely to be incorporated into management prescriptions and collaboration among stakeholders became much more of a norm.[12]

C. EBM Principles in Migration Conservation

Migration conservation exemplifies many of these same principles. In most cases, a proposal to protect migrations is a move to expand the spatial and temporal scale of management.[13] While traditional management might

---

9 Grumbine, *supra* note 1, at 31. Adaptive management incorporates an explicit process of learning into management actions, either passively, a process of "learning by doing" by incorporating monitoring and evaluation, or actively by incorporating a rigorous process of identifying uncertainties by developing a conceptual model, then formulating experiments to test hypotheses about the areas of uncertainty, so that management actions become more informed over time. *See generally* C.S. HOLLING, INT'L INST. FOR APPLIED SYS. ANALYSIS, ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT (1978) (arguing that real-world experience is most useful in analyzing ecosystem management); CARL WALTERS, ADAPTIVE MANAGEMENT OF RENEWABLE RESOURCES (1986) (arguing that mathematical and statistical analysis should be used to organize ecosystem management experience and reduce uncertainty in management efforts).

10 While there are very few cases in which analysts would agree that successful adaptive management has occurred, ecosystem management efforts that exemplify an adaptive approach (with limited success) include restoration of south Florida ecosystems, the Grand Canyon Adaptive Management Program, and the Trinity River. *See, e.g.*, COMPREHENSIVE EVERGLADES RESTORATION PLAN, ADAPTIVE MANAGEMENT STRATEGY (2006), *available at* http://www.evergladesplan.org/pm/recover/recover_docs/am/rec_am_stategy_brochure.pdf; COMM. ON GRAND CANYON MONITORING & RESEARCH, NAT'L RESEARCH COUNCIL, DOWNSTREAM: ADAPTIVE MANAGEMENT OF THE GLEN CANYON DAM AND THE COLORADO RIVER ECOSYSTEM 54–65 (1999). For a description of adaptive environmental assessment and management at the Trinity River Restoration Program, see Trinity River Restoration Program, Adaptive Environmental Assessment and Management, http://www.trrp.net/science/AEAM.htm (last visited Feb. 26, 2011).

11 Federal forest management in the Pacific Northwest was transformed during this period from an overriding emphasis on management of timber to a broader system of management of old growth resources, resulting in a major shift in timber production. *See* FOREST ECOSYSTEM MGMT. ASSESSMENT TEAM, FOREST ECOSYSTEM MANAGEMENT: AN ECOLOGICAL, ECONOMIC AND SOCIAL ASSESSMENT II-1 to -3 (1993).

12 MEFFE ET AL., *supra* note 2, at 3–4.

13 *See* Robert L. Fischman & Jeffrey B. Hyman, *The Legal Challenge of Protecting Animal Migrations as Phenomena of Abundance*, 28 VA. ENVTL. L.J. 173, 179–81, 186, 203–04 (2010). For example, New World Red Knots (*Calidris canutus rufa*) migrate between breeding groups in the Canadian Arctic and wintering grounds in South America, and rely on a set of stopover points in order to build up energy for the next leg of their journey. *See, e.g.*, Lawrence J. Niles et al., *Effects of Horseshoe Crab Harvest in Delaware Bay on Red Knots: Are Harvest Restrictions Working?*, 59 BIOSCIENCE 153, 153 (2009). One of the reasons the Red Knot population has

have focused on the place-based needs of a population, migration management must expand management boundaries to include pathways and far-flung places of importance to a species. The recognition that winter range and summer range are both important to the viability of a species expands the temporal considerations underlying management. Indeed a focus on migration itself highlights one key ecosystem process critical to the genetic fitness and biotic health of a species, and incorporates a complex-systems view of what is necessary to manage a wildlife population.

The Grand Teton National Park (GTNP) pronghorn antelope (*Antilocapra americana*) herd provides a good illustration. The herd travels up to 560 kilometers each year from winter range in the Upper Green River Basin to summer range in the GTNP and the surrounding areas of Jackson Hole valley.[14] This migration may well be the longest migration undertaken by a non-avian species in the continental United States, second only to the Arctic caribou (*Rangifer tarandus*).[15] Better management of this population requires an expanded definition of the spatial scale of management. It also requires a transboundary focus on habitat and threat management that goes beyond single agency approaches carried out by the National Park Service, the Bridger-Teton National Forest (BTNF), or the Wyoming Game and Fish Department.[16] Appropriate management strategies need to incorporate a temporal dimension—restrictions on activities at certain times of the year—that is more sophisticated than traditional zoning schemes. It would be implemented through multiple tools for behavior change including county-level subdivision development guidelines, state-advised livestock grazing practices, federal and local-level permitting processes on natural gas development, and technical assistance provided by nongovernmental groups.

Most places that are moving toward better protection of migrations are finding it necessary to promote cooperation and collaboration among scientists and stakeholders in defining appropriate corridors and addressing key threats. Cooperation and collaboration can take many forms,[17] including

---

declined has come from overharvesting of horseshoe crabs resulting in reduced availability of crab eggs for Red Knot consumption in Delaware Bay in the eastern United States. *Id.* at 158. An ecosystem-scale focus on Red Knot migration conservation must consider these far-flung habitat areas. *Id.* at 161. Management also may require more sophisticated temporal strategies including reduced harvesting of horseshoe crabs during certain seasons. *See id.* at 154.

14 Joel Berger, *The Last Mile: How to Sustain Long-Distance Migration in Mammals*, 18 CONSERVATION BIOLOGY 320, 324, 331 app. 1 (2004); *see also* Joel Berger et al., *Connecting the Dots: An Invariant Migration Corridor Links the Holocene to the Present*, 2 BIOLOGY LETTERS 528, 530 (2006).

15 *See* Berger, *supra* note 14, at 331 app. 1.

16 *See* David N. Cherney & Susan G. Clark, *The American West's Longest Large Mammal Migration: Clarifying and Securing the Common Interest*, 42 POL'Y SCI. 95, 104–05 (2009).

17 In another article, I described a rough taxonomy of cooperative behaviors: 1) awareness, "being cognizant of others' interests and actions"; 2) communication, "talking about goals and activities"; 3) coordination, "actions of one party are carried out in a manner that supports (or does not conflict with) those of another"; and 4) collaboration, "active partnerships with resources being shared or work being done by multiple partners." Steven L. Yaffee, *Cooperation: A Strategy for Achieving Stewardship Across Boundaries*, *in* STEWARDSHIP ACROSS BOUNDARIES, *supra* note 3, at 299, 301 tbl.14.1. Definitions of collaboration generally involve a

simple arrangements for sharing information and partnerships that link agencies and private landowners in a set of activities aimed at a common purpose. For example, corridor mapping exercises by South Coast Wildlands in southern California and the continent-wide mapping by Wildlands Network have involved collaborative science.[18] In managing the GTNP pronghorn, Wyoming Game and Fish staff have worked with landowners to remove fence barriers since at least 2000.[19] The Corridor Conservation Campaign effort involved the Green River Valley Land Trust (GRVLT) working with local landowners to install wildlife-friendly fencing using federal dollars to cover costs.[20] In California's Eastern Sierra, management of the Round Valley mule deer (*Odocoileus hemionus hemionus*) herd has involved informal partnerships between the Eastern Sierra Land Trust, local resource agencies, and other conservation organizations, and has resulted in increased awareness of the migration corridor issue and specific bottlenecks along the way.[21]

In some places, collaboration involves complex multiparty working groups created to develop consensus-based solutions to complex problems. One of the key threats to the pronghorn lies in a "bottleneck" near Trapper's Point, west of Pinedale, Wyoming, where the pronghorn funnel into a river valley where movement is constrained by a highway and subdivision. In 2003, the Trapper's Point Working Group convened, involving the Wyoming Game and Fish Department, the Wildlife Conservation Society, GRVLT, the Wyoming Department of Transportation, and others.[22] Their mission was to develop recommendations for the U.S. Bureau of Land Management's Resource Management Plan and to develop a protection plan for the Trapper's Point area.[23] In the case of the Round Valley mule deer migration,

joint decision-making process. Steve Selin & Deborah Chavez, *Developing a Collaborative Model for Environmental Planning and Management*, 19 ENVTL. MGMT. 189, 190 (1995) ("Collaboration implies a joint decision-making approach to problem resolution where power is shared, and stakeholders take collective responsibility for their actions . . . .").

18 S. COAST WILDLANDS, SOUTH COAST MISSING LINKAGES: A WILDLAND NETWORK FOR THE SOUTH COAST ECOREGION 3–4 (2008), *available at* http://www.scwildlands.org/reports/SCMLRegionalReport.pdf. The Wildlands Network has mapped four major corridors in North America: the Eastern Wildway extending northward from the Everglades along the Appalachians to the Arctic; the Western Wildway spanning the continent from Mexico, through the Rockies, to Alaska; the Pacific Wildway running from Baja to Alaska; and the Boreal Wildway running west-east from Alaska to the Canadian Maritimes across the forest roof of North America. *See* Wildlands Network, Wildways: Creating Landscapes for Life, http://www.twp.org/wildways (last visited Apr. 27, 2011).

19 *See* Cherney & Clark, *supra* note 16, at 108.

20 David N. Cherney, *Securing the Free Movement of Wildlife: Lessons from the American West's Longest Land Mammal Migration*, 41 ENVTL. L. 599, 609–10 (2011); *see also* Andrew Fotinos et al., Ungulate Pathways of the West: Challenges and Opportunities for Conserving Ungulate Migrations in the Western United States 45 (Apr. 2009) (unpublished Master of Science project, School of Natural Resources and Environment, University of Michigan), *available at* http://deepblue.lib.umich.edu/bitstream/2027.42/62100/1/Ungulate_Pathways.pdf.

21 Fotinos et al., *supra* note 20, at 30.

22 Memorandum from Wyo. Game & Fish Dep't on Trapper's Point Bottleneck Conservation (Oct. 1, 2003) (unpublished meeting notes) (on file with Wyoming Game & Fish Department).

23 *See infra* note 29 and accompanying text.

the Mono County Collaborative Planning Team created a memorandum of understanding regarding mule deer habitat among agencies, which included the California Department of Fish and Game, Caltrans, the Los Angeles Department of Water and Power, and the Inyo National Forest.[24]

III. IMPLEMENTATION CHALLENGES FACING EBM AND MIGRATION CONSERVATION

While EBM principles make sense at a conceptual level, implementing them has been challenging due to factors that are also present in corridor protection. Table 1 summarizes the challenges facing collaborative ecosystem management identified in Professors Wondolleck and Yaffee's 2000 study of more than one hundred cases of interorganizational collaboration in resource management.[25] These include *institutional and structural barriers*, such as conflicting organizational missions, policies that limit the flexibility needed to bridge organizational boundaries and limited resources; and *attitudinal issues*, including a lack of trust, the presence of organizational cultures that resist various elements of an EBM approach, and leaders that are unwilling to allow staff to move in this direction.[26] While the language of collaboration pervades resource management practice, with managers deftly using terms like "win–win" and "stakeholder engagement," considerable evidence exists that the *process skills* needed to make these approaches work are not always part of agency managers' toolkits.[27]

Table 1: Challenges Evidenced in Cases of Collaborative Ecosystem Management[28]

Institutional and Structural Barriers

- Lack of Opportunity or Incentives to Collaborate
- Conflicting Goals and Missions
- Inflexible Policies and Procedures
- Limited Resources

Attitudes and Perceptions

- Mistrust
- Group Attitudes About Each Other
- Organizational Norms and Culture
- Lack of Support from Leadership

Problems with the Process of Collaboration

- Unfamiliarity with the Process
- Lack of Process Skills
- Difficulties Managing the Relationship Between the Collaboration and Its Context

24 Fotinos et al., *supra* note 20, at 31.
25 *See* YAFFEE ET AL., *supra* note 5, at 49–65.
26 *See id.* at 31–34.
27 WONDOLLECK & YAFFEE, *supra* note 5, at 64.
28 *Id.* at 51–66.

Subsequent studies have tended to corroborate the challenges in Table 1.[29] For example, in a study of the implementation of EBM by the Bureau of Land Management, Professor Koontz and Jennifer Bodine identified political, cultural, and legal factors as the most problematic.[30] These challenges included pressure for single-use management, a lack of resources, resistance to change, lawsuits that limited the potential for change, fragmented ownership boundaries, and the difficulties of getting groups with different perspectives to work together.[31] Perhaps most surprising was that scientific knowledge and leadership support were ranked as some of the lowest challenges in practice.[32]

The limited evidence from corridor conservation efforts is that many of these same challenges are at play. In a study of four cases of corridor conservation, Andrew Fotinos et al. highlighted conflicting directives and goals held by different public agencies as a major concern, with varying federal and state missions and cultures as particularly problematic.[33] They also pointed to limited resources, particularly staffing, to collect data, coordinate actions, and engage with nongovernmental parties.[34] For private lands, a mismatch between environmental review procedures that focus on incremental, project-by-project permitting and the cumulative, landscape-scale needs of migratory animals was also noted as a challenge.[35]

Both case studies of migration conservation profiled in this special issue exemplified these challenges. All collaborative processes need to manage the tension between centrifugal forces that undermine collaboration, and centripetal forces that incentivize joint action.[36] Even though most parties in the Kittatinny Ridge Coalition and the Path of the Pronghorn efforts shared the overarching goals of migration protection, neither faced strong enough incentives to motivate larger-scale collaboration. In Kittatinny Ridge, the scale of the effort is too large to drive a shared identity (137 communities in twelve counties joined with dozens of nongovernmental groups and focused on an area of more than five hundred square miles), too incremental to create a sense of crisis, and not extraordinary enough to motivate action.[37] In the Pronghorn case, strong identities defined by socioeconomic characteristics and geography create mistrust that makes it hard to find common ground.[38] Indeed, very different

29 *See, e.g.*, Tomas M. Koontz & Jennifer Bodine, *Implementing Ecosystem Management in Public Agencies: Lessons from the U.S. Bureau of Land Management and the Forest Service*, 22 CONSERVATION BIOLOGY 60, 60–69 (2008).

30 *Id.* at 66.

31 *Id.*

32 *Id.*

33 Fotinos et al., *supra* note 20, at 213–14.

34 *Id.* at 214.

35 *Id.*

36 Yaffee, *supra* note 17, at 304.

37 *See* Jamison Colburn, *Habitat Reserve Problem-Solving: Desperately Seeking Sophisticated Intermediaries*, 41 ENVTL. L. 619, 625 (2011).

38 Cherney, *supra* note 20, at 598–600.

interests in how the pronghorn protection takes place led to strategic framing of the problem that further fragmented potential collaborative relationships.[39] In addition, the Trapper's Point Working Group, one attempt at larger scale collaboration, failed to produce consensus recommendations at least in part due to poor process design and management: an artificially-imposed three-month deadline and numerous process management challenges that undermined the group's ability to find a strategy.[40]

IV. PROMOTING SUCCESSFUL EBM AND MIGRATION CONSERVATION

Since many of the core principles of EBM and migration conservation are the same, and the challenges facing proponents of both appear similar, factors that have promoted successful collaborative management in EBM are likely to assist efforts to better manage migrations and corridors. The experience from two decades of on-the-ground EBM efforts suggests that a wide range of factors facilitate progress (Table 2) and that these factors often reinforce each other.[41] Some are simply mirror images of challenges, as is the case when dedicated financial resources enable cross-boundary activity. Some motivate people in conflict to work collaboratively toward joint goals, while others sharpen an individual's or agency's sense of strategic gains through collaboration. Some are structural, derived from law or agency programs; but many are less formal, such as the presence of dedicated, energetic individuals. Hence these factors can be seen as the bricks and mortar of collaboration, where agency programs or legal structures provide the bricks, while more attitudinal factors provide the mortar that keeps the efforts together. In an increasingly fragmented and pluralistic society,[42] institutions or individuals that have the ability and vantage point to bridge differences are critically important.

39 *Id.* at 599.

40 Cherney & Clark, *supra* note 16, at 103.

41 YAFFEE ET AL., *supra* note 5, at 27.

42 *See* ROBERT D. PUTNAM, BOWLING ALONE: THE COLLAPSE AND REVIVAL OF AMERICAN COMMUNITY 288 (2000) (describing the importance of bridging and bonding social capital to resolve collective problems, yet highlighting the decline of such capital in a society with fewer bridging institutions).

Table 2: Factors Promoting Successful Collaborative Ecosystem Management[43]

Motivation
- Sense of Urgency Due to Perception of Crisis or Threat
- Perception of Interdependence Due to Shared Goals or Strong Sense of Place
- Incentives Created by Alternatives to Collaboration
- Opportunities to Gain Due to Financial Inducements

Organization
- Government Programs or Comparable Opportunities
- Coordinator or Clear Leadership Responsibility
- Well-Managed and Open Process
- Development and Use of a Management Plan or Comparable Framework for Joint Action

Resources
- Facilitation and Process Management
- Scientific Expertise and Information
- Dedicated Funding, Staff, and Equipment

Adaptability
- Joint Learning Grounded in Credible Science
- Ongoing Monitoring and Assessment Connected to Decision Making

Legitimacy
- Effective Representation of All Affected Interests
- Accountability and Ties to Statutory Decision-Making Processes
- Commitment and Follow-Through of Agency and Political Leaders

Energy
- Dedicated, Energetic Individuals
- Process Champions, Social Networks, and Preexisting Relationships
- Small Successes

A. Incentives to Cooperate

In most situations, considerable incentive exists for individuals or groups to operate independently, hence collaboration must be motivated or it will not occur. In many EBM cases, motivation came from the shared

[43] Adapted from WONDOLLECK & YAFFEE, *supra* note 5 (providing advice and observations drawn from a decade of research regarding successful collaborative ecosystem management efforts).

perception of a threat to a valued resource.[44] At times, a perception of crisis was needed to force agencies and other parties to rise above their competing interests and take shared action.[45] Crises could be environmental, as when old growth habitat loss threatened species such as the Northern Spotted Owl,[46] or they could be regulatory, such as when the threat of Endangered Species Act-derived litigation encouraged parties to negotiate with each other.[47]

Shared identification with a place such as the Sierra Nevada or the ancient forests of the Pacific Northwest helped parties to overcome their conflict-laden characterization of others as tree huggers, callous bureaucrats, or profiteers.[48] In some places, the alternative to collaborative action became so distasteful that disputing interests were motivated to try to work together, such as when continued litigation over management of endangered fisheries in the Missouri River started to appear so costly and exhausting to stakeholder groups that it was "time for something different."[49] And in many places, the opportunity to secure significant financial resources for a collaborative effort motivated action, as has been the case with lining up agency, political, and nongovernmental support for restoration initiatives in the Great Lakes and south Florida.[50]

Conservation of migration corridors and migrating animals may respond to some of these same facilitating factors. For some charismatic species facing threats, such as Monarch butterflies (*Danaus plexippus*), sea turtles, and Sandhill Cranes (*Grus canadensis*), threats may be sharpened into a sense of crisis by advocates for the species. In other places, providing a unique identity by naming a corridor may help to motivate action. The "Missing Linkages" efforts of South Coast Wildlands in southern California may well fall into this category, as do comparable efforts in Arizona,

44 *Id.* at 76–77.

45 *Id.* at 77.

46 STEVEN LEWIS YAFFEE, THE WISDOM OF THE SPOTTED OWL: POLICY LESSONS FOR A NEW CENTURY 156–57 (Island Press 1994).

47 In battles over the future of the Grayrocks Dam near Laramie, Wyoming, regulatory uncertainty encouraged the parties to negotiate. *See* LAWRENCE S. BACOW & MICHAEL WHEELER, ENVIRONMENTAL DISPUTE RESOLUTION 46–50 (1984).

48 *See* Barbara Gray, *Framing of Environmental Disputes*, *in* MAKING SENSE OF INTRACTABLE ENVIRONMENTAL CONFLICTS: CONCEPTS AND CASES 11, 21–24 (Roy J. Lewicki, Barbara Gray & Michael Elliott eds., 2003); Todd A. Bryan & Julia M. Wondolleck, *When Irresolvable Becomes Resolvable: The Quincy Library Group Conflict*, *in* MAKING SENSE OF INTRACTABLE ENVIRONMENTAL CONFLICTS: CONCEPTS AND CASES, *supra*, at 68, 81–89.

49 COLLABORATIVE DECISION RES. ASSOC., SITUATION ASSESSMENT REPORT ON THE FEASIBILITY AND CONVENING OF A MISSOURI RIVER RECOVERY IMPLEMENTATION COMMITTEE 17–18 (2006), *available at* http://www.mediate.org/wp-content/uploads/nat-resources_mrric.pdf.

50 President Obama announced a $475 million restoration program for the Great Lakes, much of which is to be carried out through grants to partner organizations. WHITE HOUSE COUNCIL ON ENVTL. QUALITY ET AL., GREAT LAKES RESTORATION INITIATIVE ACTION PLAN 4 (2010), *available at* http://greatlakesrestoration.us/action/wp-content/uploads/glri_actionplan.pdf. Congress approved a comprehensive restoration program for the Everglades ecosystem in 2000. Expected to provide upwards of $10.9 billion in federal, state, and other funds, approximately $1.4 billion in initial projects have been funded. PERVAZE A. SHEIKH & NICOLE T. CARTER, CONG. RESEARCH SERV., RS22048, EVERGLADES RESTORATION: THE FEDERAL ROLE IN FUNDING 1 (2006), *available at* http://cnie.org/nle/crsreports/06feb/RS22048.pdf.

Colorado, and elsewhere.[51] The efforts of the U.S. Bureau of Land Management and nongovernmental groups at labeling the pronghorn migration as the "Path of the Pronghorn" may also focus attention in a productive manner.[52] Indeed, the Wyoming Outdoor Council distributed a film entitled *Ancient Corridors* to provide focus on the migration itself.[53] On the other hand, the abundance of some migratory animals in portions of their range may undercut motivation to act.[54]

Significant funding aimed at connecting habitat fragments may also be a potent motivator of joint action. This incentive was evident in the wildlife habitat network funding of the Doris Duke Charitable Foundation and may be a part of future federal climate change adaptation programs.[55] While the funding itself is important as a resource, the opportunity to secure funding is a way to motivate collaborative action, even if most parties to the collaboration are simply seeking a mechanism to accomplish their own individual goals.

B. Using Existing Governmental Structures and Planning Processes

In EBM, preexisting government programs often provided a vehicle through which collaboration was initiated. For example, in marine conservation, the National Estuary Program (NEP) of the U.S. Environmental Protection Agency (EPA)[56] and the National Marine Sanctuary Program (NMSP) of the U.S. National Oceanic and Atmospheric Agency (NOAA)[57] are providing structures through which scientists are

---

51 *See, e.g.*, S. COAST WILDLANDS, *supra* note 18, at 1, 3–4; S. ROCKIES ECOSYSTEM PROJECT, LINKING COLORADO'S LANDSCAPES: A STATEWIDE ASSESSMENT OF WILDLIFE LINKAGES PHASE I REPORT 1 (2005), *available at* ftp://167.131.109.8/techserv/ORWildlifeMoveStrategy/Reading/Colorados%20Report%20on%20Linking%20Landscapes.pdf; Ariz. Dep't of Transp., The Arizona Wildlife Linkages Workgroup, http://www.azdot.gov/inside_adot/OES/AZ_WildLife_Linkages/workgroup.asp (last visited Feb. 25, 2011).

52 *See* Cherney, *supra* note 20, at 603–05.

53 DVD: Ancient Corridors—Following the Prehistoric Path of the Pronghorn (Wyoming Outdoor Council 2006); *see also* Molly Absolon, *Ancient Corridors—Following the Prehistoric Path of the Pronghorn*, FRONTLINE REP., Fall 2006 at 10, *available at* http://www.wyomingoutdoorcouncil.org/html/press_room/pdfs/Newsletters/2006Fall-FL.pdf (announcing release of DVD documenting pronghorn migrations).

54 Fischman and Hyman note the lack of legal concern for migrations associated with species with abundant populations. Fischman & Hyman, *supra* note 13, at 175–76.

55 *See* Press Release, Doris Duke Charitable Found., Doris Duke Charitable Foundation and Wildlife Conservation Society Announce New Funding and New Climate Adaptation Focus for Grants Program Supporting Conservation Projects Nationwide (Jan. 12, 2011), *available at* http://www.ddcf.org/Global/Environment/2011%20DDCF-WCS%20Press%20Release.pdf.

56 The NEP concentrates its efforts in 28 coastal regions around the United States and provides grants and technical assistance for management and restoration purposes. U.S. ENVTL. PROT. AGENCY, NATIONAL ESTUARY PROGRAM (n.d.), *available at* http://water.epa.gov/type/oceb/nep/upload/2009_12_23_estuaries_pdf_nep_brochure_timeless_new.pdf (booklet about NEP).

57 NOAA's NMSP focuses on 14 protected areas around the United States. Nat'l Marine Sanctuaries, Sanctuary Management 101, http://sanctuaries.noaa.gov/management/

sharing information and stakeholders are providing input on management direction.[58] In terrestrial EBM, planning processes for public lands have provided a mechanism to engage partners. Many of these same mechanisms could be used to facilitate collaborative action for corridor protection. For example, the BTNF in Wyoming designated a Pronghorn Migration Corridor in a national forest plan amendment adopted in 2008.[59] Such designations enable collaborative research and partnerships aimed at implementing protection within the migration corridor.[60]

While EBM efforts have at times only been successful at producing a plan and have bogged down during implementation, having an agreed-upon plan or framework for action has empowered those who would advocate for its implementation. While the BTNF plan amendment did not change any current direction for the identified area and does not make decisions about compatible uses,[61] it enables the use of memoranda of understanding and partnership arrangements that nongovernmental groups are using to carry out work on the BTNF.[62] Ultimately, designation may provide a vehicle for nongovernmental groups to press for action to comply with the plan.

C. Obtaining Adequate Resources Through Partnerships

Since a lack of resources has been one of the major cited challenges facing managers and collaborators engaged in EBM,[63] having funding, staffing, scientific information, and good process management skills available can facilitate progress. State and federal agencies may have expertise that enables good management decisions if the migrating species are game animals or are listed sensitive species; other species may be more challenged by a lack of good information. Given federal and state budget cutbacks, resources for corridor conservation may well need to come from nongovernmental partners. Indeed, examples of current efforts to manage

mgt101.html (last visited Apr. 27, 2011). It provides staffing, funding, and planning processes that foster conservation and restoration activity. *Id.*

58 Both programs provide offices and structures through which conservation work has been coordinated and carried out. Congress established EPA's NEP in 1987 to provide funding and capacity to improve the water quality and biotic health of estuaries of national significance. U.S. Envtl. Prot. Agency, National Estuary Program, http://water.epa.gov/type/oceb/nep/index.cfm (last visited Apr. 27, 2011).

59 CAROLE "KNIFFY" HAMILTON, BRIDGER-TETON NAT'L FOREST, U.S. FOREST SERV., DEP'T OF AGRIC., DECISION NOTICE & FINDING OF NO SIGNIFICANT IMPACT: PRONGHORN MIGRATION CORRIDOR FOREST PLAN AMENDMENT (2008), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_063055.pdf

60 Fotinos et al., *supra* note 20, at 166.

61 Fischman & Hyman, *supra* note 13, at 215.

62 Fotinos et al., *supra* note 20, at 240–41.

63 YAFFEE ET AL., *supra* note 5, at 31–33; *see also* SHEILA K. SCHUELLER, ECOSYSTEM MGMT. INITIATIVE, UNIV. OF MICH., TRENDS IN COLLABORATIVE ECOSYSTEM MANAGEMENT: A PRELIMINARY REPORT OF EM 2003 SURVEY RESULTS 32 (2004), *available at* http://www.snre.umich.edu/ecomgt/research/em03_draft_results.pdf; Mark T. Brush et al., Recent Trends in Ecosystem Management 105–06 (Apr. 2000) (unpublished Master of Science project, University of Michigan), *available at* http://www.snre.umich.edu/ecomgt/pubs/documents/trends.pdf.

corridors rely on nongovernmental collaborators as important partners. These include: the Rocky Mountain Elk Foundation's work on the Absaroka Conservation Initiative, an effort designed to protect migration corridors of the Clark's Fork and Cody elk herds in Wyoming;[64] work by the Eastern Sierra Land Trust focused on the Round Valley mule deer migration in California;[65] and activities of the GRVLT, the Wildlife Conservation Society, the Jackson Hole Conservation Alliance, and the Jackson Hole Land Trust on protection of the GTNP pronghorn migration.[66]

Partnership arrangements are particularly important in carrying out educational outreach to private landowners and community members, a process of technical assistance and engagement vital to achieving changes in private land management, securing easements on important habitat segments, and achieving public concurrence on the nature of the problem and strategies for protection.[67] The GRVLT wildlife-friendly fencing program provides a good example. GRVLT was able to secure one million dollars in funds from the Jonah Compensation Mitigation Fund to initiate a program to influence private rancher behavior.[68] According to the project director, "We motivated conservation behavior by offering and in fact installing cost-free wildlife-friendly fencing for interested landowners. The fact that the modifications were free and voluntary was an important consideration."[69] This partnership arrangement leveraged funding and staffing beyond what was available from the BTNF, and provided a nonthreatening mechanism for outreach to private landowners. Indeed, such nongovernmental advocates for public goods such as migration conservation may be the only way to achieve objectives in places where property rights concerns and anti-government feeling are high.

D. Monitoring for Adaptive Management

While textbook-quality adaptive management has rarely been seen in EBM practice, projects have benefited from deliberate efforts at joint learning through collaborative science, monitoring, and evaluation. Place-based restoration efforts, including the Chesapeake Bay, Florida Everglades, and the Trinity River in California, have developed extensive monitoring and management protocols that are designed to ensure the legitimacy of their efforts in the eyes of the multiple partners.[70] Restoration programs for the

64 Fotinos et al., *supra* note 20, at 237.

65 *Id.* at 238.

66 *Id.* at 240–42.

67 *Id.* at 211–13.

68 *Id.* at 241–42.

69 *Id.* at 242 (quoting a February 24, 2009, personal communication from Jordan Vana of the GRVLT).

70 *See* Chesapeake Bay Program, Monitoring, http://www.chesapeakebay.net/monitoring.aspx?menuitem=19916 (last visited Mar. 2, 2011) (explaining that the Chesapeake Bay Watershed Program, a state-federal restoration partnership, monitors 19 physical, chemical, and biological characteristics twenty times per year); COMPREHENSIVE EVERGLADES

Pacific salmon (*Oncorhynchus*) in the Pacific Northwest have evidenced some of the more deliberate efforts to identify uncertainty and incorporate adaptive responses into management prescriptions. Developed as a collaborative multi-watershed response to the listing of particular runs of salmon, and first entitled Shared Strategy and then Puget Sound Partnership, the programs have been structured to promote watershed-scale planning and action coupled with experiment-driven research, monitoring, and evaluation.[71] While monitoring and evaluation can be challenging at the scale of effort needed to restore salmon, adaptive management may be easier in the case of many other migratory species. By having single species indicators measurable across temporal and spatial boundaries, it may be possible to define population and habitat metrics and to prioritize research and management for experimentation purposes.

E. Enhancing Political Support

EBM projects also benefited from mechanisms used to enhance the perceived legitimacy of their efforts. These approaches include outreach to ensure representation of the range of affected groups in the collaborative effort, efforts to ensure that the collaboration is well tied to ongoing statutory decision-making processes, and significant commitment and follow-through by agency and political leaders.[72] Parties involved in EBM often point to limited "political will" as a major barrier;[73] commitment by high level political officials often provides the legitimacy needed to encourage agency staff and nongovernmental actors to take the processes seriously. For example, having gubernatorial buy-in to the Everglades restoration and commitment by multiple governors in the Gulf of Mexico Alliance has been critical to the restoration progress.[74]

Achieving political buy-in to corridor and migration conservation will probably depend on the specific context. Long distance, wide-ranging migrations such as the travels of the Pacific Loggerhead Turtle (*Caretta caretta*) may be harder because of the many involved countries and

RESTORATION PLAN, *supra* note 10, at 4 (Florida Everglades); Trinity River Restoration Program, *supra* note 10 (Trinity River in California).

71 *See* PUGET SOUND P'SHIP, STRATEGIC SCIENCE PLAN 21 (2010), *available at* http://www.psp.wa.gov/downloads/SCIENCE/strategicscience_09_02_10.pdf; SHARED STRATEGY FOR PUGET SOUND, AN INTRODUCTION TO THE SHARED STRATEGY 1 (n.d.), *available at* http://www.sharedsalmonstrategy.org/files/Intro%20to%20SSPS.pdf.

72 *See* COMPREHENSIVE EVERGLADES RESTORATION PLAN, *supra* note 10, at 3 (demonstrating that the south Florida restoration program has exhibited most of these characteristics).

73 NAT'L CTR. FOR ECOLOGICAL ANALYSIS & SYNTHESIS, ASSESSMENT OF INFORMATION NEEDS FOR ECOSYSTEM-BASED MANAGEMENT OF COASTAL MARINE SYSTEMS: EXECUTIVE SUMMARY 1 (2008), *available at* http://www.nceas.ucsb.edu/files/research/ebm/survey_execsum_Oct2008.pdf.

74 *See, e.g.*, GULF OF MEX. ALLIANCE, GOVERNORS' ACTION PLAN FOR HEALTHY AND RESILIENT COASTS 4 (2006), *available at* http://gulfofmexicoalliance.org/pdfs/gap_final2.pdf; Everglades Forever, Restoring the Everglades Ecosystem, http://www.dep.state.fl.us/evergladesforever (last visited Mar. 7, 2011).

competing claims in international waters.[75] Unlike place-based restoration projects, migration conservation often involves more dispersed parties with fewer shared interests other than the population status of the migratory species.[76] Hence, finding a basis for cooperation may be challenging. It is heartening that the Western Governors' Association (WGA) adopted a resolution supporting protection of migration corridors partly as a defensive action against rampant oil and gas development.[77] The WGA subsequently created a Western Wildlife Habitat Council to pursue research and promote action.[78] However, whether such symbolic action will be followed up by real support for migration or corridor conservation depends on the level of broader public support for these actions and the cost of taking action.

F. Tapping into the Energy of Dedicated "Champions"

Finally, just as Monsters, Inc.[79] drew its energy from children's screams, collaborative EBM has drawn on the energies of dedicated individuals who went beyond their job descriptions and their organizations' bureaucratic norms.[80] These individuals include agency and nongovernmental organization (NGO) staff, volunteers, and other community members.[81] When structuring a collaborative group, facilitators seek to include not just "stakeholders," but also visionaries and process champions.[82] These are the

---

75 The turtle's migration includes habitat and stopovers in Alaska, Chile, Japan, and Mexico. *See generally* Jeffrey J. Polovina et al., *Forage and Migration Habitat of Loggerhead (*Caretta caretta*) and Olive Ridley (*Lepidochelys olivacea*) Sea Turtles in the Central North Pacific Ocean*, 13 FISHERIES OCEANOGRAPHY 36, 36 (2004) (discussing turtle migration patterns).

76 *See* Jeffrey B. Hyman, Andrea Need & W. William Weeks, *Statutory Reform to Protect Migrations as Phenomena of Abundance*, 41 ENVTL. L. 407, 423–25, 441 (2011).

77 W. GOVERNORS' ASS'N, POLICY RESOLUTION 07-01, PROTECTING WILDLIFE MIGRATION CORRIDORS AND CRUCIAL WILDLIFE HABITAT IN THE WEST (2007), *available at* http://www.blm.gov/pqdata/etc/medialib/blm/wy/information/NEPA/pfodocs/anticline/revdr-comments/eg.Par.89268.File.dat/02Bio-attach14.pdf; W. GOVERNORS' ASS'N, WILDLIFE CORRIDORS INITIATIVE OIL AND GAS WORKING GROUP REPORT 1 (2007), *available at* http://www.westgov.org/wga/publicat/OilGas07.pdf.

78 W. GOVERNORS' ASS'N, WESTERN WILDLIFE HABITAT COUNCIL ESTABLISHED 5–6 (2008), *available at* http://www.westgov.org/wga/publicat/wildlife08.pdf.

79 MONSTERS, INC. (Disney & Pixar 2001).

80 WONDOLLECK & YAFFEE, *supra* note 5, at 177–79. Sometimes these individuals scream as much as the children facing monsters!

81 *See* Brush et al., *supra* note 63, at 3, 49, 129 (describing the importance of NGOs, volunteers, and members of community groups to the long-term success of EBM).

82 Selin & Chavez, *supra* note 17, at 191 (noting the importance of a strong leader or interested party to the success of a collaborative effort). Another study of successful collaborative efforts noted that

> [e]very Great Group has a strong leader. This is one of the paradoxes of creative collaboration. Great Groups are made up of people with rare gifts working together as equals. Yet, in virtually every one there is one person who acts as maestro, organizing the genius of the others. . . .
>
> . . . .
>
> Within the group, the leader is often a good steward, keeping the others focused, eliminating distractions, keeping hope alive in the face of setbacks and stress.

people that articulate shared goals, remind participants of the value of their collaborative work when times get tough, and provide the basis for all parties to rise above their parochial concerns. Since ecological outcomes may require long term sustained collaborative effort, ways to continue to energize a group are important. In the case of protecting migration corridors as a climate adaptation strategy, the challenge is particularly acute because efforts are aimed at avoiding an uncertain but feared outcome rather than solving an immediate problem. For most groups, celebrating small successes is one way to maintain momentum. For migration conservation, habitat protections can be measured: each hectare of priority habitat protected out of a defined corridor is a reportable accomplishment. Charting such outcomes on a report card or progress thermometer can be helpful.

V. The Lifecycle of EBM Efforts

Another lesson from the EBM experience is that projects move forward dynamically through a lifecycle of strategies and outcomes (Figure 1). By understanding this evolution, one can better plan for changes in strategies and be prepared to see changes emerge over longer periods of time than would be desirable. In addition, measures of success need to be tiered to the specific stage of the project lifecycle.

A. Stages in the EBM Lifecycle

Projects are usually initiated in response to a crisis, perceived threat, or opportunity posed by political or institutional changes, as discussed above.[83] Often a period of outreach and information collection determines which interagency and multiparty communication takes place.[84] At this stage, the best measure of success lies in understanding which groups have been mobilized to be involved.

Warren Bennis & Patricia Ward Biederman, Organizing Genius: The Secrets of Creative Collaboration 199–200 (1997).

83 *See supra* Part IV.A.

84 *See* Yaffee et al., *supra* note 5, at 18 (reporting that many project leaders "noted that it was imperative for the success of ecosystem management projects that all stakeholders be involved in development and implementation of project activities"); Brush et al., *supra* note 63, at 32–33 (detailing a research survey conducted by authors of 105 ecosystem management projects which found that, in 1999, 59% of the survey participants conducted education and outreach, and 68% collected new information to promote their project; additionally, 80% used existing state and federal programs, enabling them to "take advantage of interagency partnerships").

Figure 1: EBM Project Evolution Showing Changes in Strategies and Outcomes

Strategies	Outcomes
Initiation	
Outreach & Involvement	More Communication & Cooperation
Collection of Information	Involvement by Agencies & Core Interests
Planning & Early Implementation	
Plan Development	Increased Group Interaction
Broader Involvement; Use of Collaborative Process	Involvement of a Broader Set of Groups (NGOs, Private)
Pilot Activities (Education, Research, Restoration)	Increased Scientific Understanding
Later Implementation	
Use of Land as Organizing Feature	Increased Trust & Respect
Increased Importance of Dedicated People & Committed Agencies	Reduced Opposition; Increased Support by Landowners
Use of Existing Programs as Tools	Better Scientific Understanding
Ecological & Social Effects	

1. Planning and Early Implementation

Most efforts move into a planning stage in which more formalized structures develop to engage a broader set of actors in the formulation of a plan for action, along with possible pilot management and restoration efforts.[85] While some small on-the-ground changes may emerge from pilot efforts, the primary outcomes of this stage are procedural and social: more interaction among groups, greater levels of involvement, and higher levels of scientific understanding. Key parties' signatures on a plan for action may

[85] *See* Brush et al., *supra* note 63, at 23, 31–32 (describing a survey of project managers, in which many participants expressed support for pilot projects as a way to move beyond the planning stage and explaining that ecological restoration is usually only appropriate after certain milestones have been met).

represent an overarching metric for this stage, since it presumably suggests that groups understand and concur on its contents.

2. Later Implementation

While groups often bog down as they try to convert a plan into action, the next stage involves implementation activities that use the plan as an organizing and motivating mechanism. Dedicated, energetic, committed individuals become particularly important to sustain activities,[86] and often they use a range of existing programs as implementation tools.[87] From these efforts come higher-level social outcomes—more support, less opposition, higher levels of trust[88]—along with more scientific understanding.[89] Over time, these social outcomes can translate into ecological outcomes.

3. Social and Ecological Improvements

Based on our time-series research on multiple EBM cases, it appears that the social and procedural improvements often precede ecological changes to enable on-the-ground restoration and management results.[90] These patterns are clearly iterative and interactive, since small-scale ecological success sometimes breeds excitement, which results in higher levels of engagement and heightened social capital. In turn, this increased engagement and heightened social capital can be used to motivate further ecological improvements. Since most of the key challenges facing EBM efforts are social and procedural, it should not be surprising that improvements in social dynamics and involvement need to be achieved before significant ecological change is likely to be sustained. At the same time, however, the long term goal of the efforts should lie in ecological change, and if collaborative efforts solely achieve procedural improvements—less conflict, more dialogue—then that is not good enough. Measures of programmatic success need to track social, procedural, and ecological change.

B. Lessons for Migration Conservation

Advocates of migration conservation should take several lessons from the EBM experience. First, these efforts take time; they are likely to be

86 *Id.* at 93–94, 97; SCHUELLER, *supra* note 63, at 31.

87 *See* Brush et al., *supra* note 63, at 32–34 (noting that coordination with existing state and federal programs has been an important implementation tool for conservation groups); SCHUELLER, *supra* note 63, at 22 (finding that the use of and coordination with existing programs was the most effective strategy in ecosystem management).

88 Brush et al., *supra* note 63, at 68–70, 107–108; SCHUELLER, *supra* note 63, at 28.

89 Brush et al., *supra* note 63, at 77–78.

90 *See id.* at 20–27, 76–77 (noting that successful procedural improvements, when combined with other social improvements, are often prerequisites to on-the-ground ecological action); *see also* SCHUELLER, *supra* note 63, at 29 (finding that as scientific understanding and quality of monitoring data improve over time, so do ecosystem health and integrity).

incremental and painfully long in duration. Second, they involve multiple strategies—ecological and social—that need to be staged effectively over time. Third, success should be measured in multiple ways that respond both to near and intermediate term success, which is often measured in procedural or social terms, as well as longer term measures of ecological change.

Given the challenges inherent in sustaining collaboration, particular attention should be paid to coordination of effort across both space and time, and management of staffing and political transitions that ensure that collaborating organizations understand and continue to buy into the collaborative effort. Ongoing outreach is critical to ensure sustained political, public, and scientific support for the efforts. Being clear about the logic of the program—how it aims to achieve success—and testing whether progress is matching that flow of logic will help in adaptive management of the effort. Finding ways to periodically ramp up the perceived level of crisis or need may be necessary to continue investment in the effort. Relationship building among key players is also worth the investment since personal relationships across agencies and organizations often provide the social capital that sustains these efforts and keeps them productive through years of work.

VI. BALANCING COERCION AND COLLABORATION—THE ROLE OF LEGAL STRUCTURES

A variety of normative perspectives have emerged on collaborative resource management. While this Article has viewed collaboration in EBM and migration conservation as a necessary tool, some have advocated for "collaborative conservation" primarily as a means of shifting power from federal and state government to private parties at the local level.[91] Others have viewed collaborative processes as an extra-legal end run around defined statutory decision-making processes, or as explicit attempts to co-opt the interests of certain parties.[92] Still others have viewed the ecological outcomes of collaborative resource management with skepticism, claiming that all collaboration produces is "feel-good hand-holding sessions" or at best, "lowest common denominator" decision making.[93] While there has been a robust dialogue in the field about the purposes and ends of collaboration, this discussion has an important upshot for those promoting migration

---

91 *See* Robert B. Keiter, *Breaking Faith with Nature: The Bush Administration and Public Land Policy*, 27 J. LAND RESOURCES & ENVTL. L. 195, 196–97, 253 (2007).

92 *See* George Cameron Coggins, *Of Californicators, Quislings and Crazies: Some Perils of Devolved Collaboration*, CHRON. COMMUNITY, Winter 1998, at 27, 28, 32; Neghin Modavi, *Mediation of Environmental Conflicts in Hawaii: Win-Win or Co-Optation?*, 39 SOC. PERSP. 301, 305 (1996); *see also* Cary Coglianese, *The Limits of Consensus: The Environmental Protection System in Transition – Toward a More Desirable Future*, ENVIRONMENT, Apr. 1999, at 28, 31–32 (1999) (detailing the several procedural deficiencies in collaborative processes that diminish the effectiveness of the outcomes reached).

93 *See* Michael McCloskey, *The Skeptic: Collaboration Has Its Limits*, HIGH COUNTRY NEWS, May 13, 1996, at 7; MARTIN A. NIE, BEYOND THE WOLVES: THE POLITICS OF WOLF RECOVERY AND MANAGEMENT 163 (Univ. of Minn. Press, 2003).

conservation. Attention needs to be paid to the context within which collaborative action takes place, so that it incentivizes good faith and real participation, and ensures accountability.

Given the challenges to EBM and migration conservation described above and that one of the key facilitating factors is shared motivation by the parties involved in collaboration, it is vitally important that the context of collaboration creates incentives for the parties to do the hard work of exploring interests and scientific realities, searching for creative strategies to move forward and be willing to buy in and take action. While some of these incentives are organically derived by a perceived crisis or a charismatic spokesperson, legal structures that establish management bottom lines are often critical to real progress. I estimate that half of the collaborative processes we have studied have succeeded because they have a regulatory driver in the form of a federally-listed endangered or threatened species.[94] Certainly there would be less Puget Sound salmon recovery work carried out by a basin-scale collaborative effort absent the listing of particular salmon runs.[95]

A. Legal Mandates or Public Lands Plans as Incentives for Collaboration

Legal mandates or public lands plans that commit to the end-state goals of a migration or a corridor help to create incentives for effective collaboration. Some may view this as coercive collaboration, but in fact, collaborative process management is greatly benefitted by some real legal and scientific boundaries that frame the decision space. And where hard choices must be made in the face of individual incentives that keep people and organizations from making those choices, almost all are coerced—by a deadline, a need to commit resources, a threat of what will happen without the choice, and the like.[96] To enable the collaboration, however, the

94 Steven L. Yaffee, *Collaborative Decision Making*, *in* 1 THE ENDANGERED SPECIES ACT AT THIRTY 208, 210 (Dale D. Goble, J. Michael Scott & Frank W. Davis eds., 2006).

95 For example, salmon recovery efforts have received a large share of restoration dollars. Kareiva et al. estimated from U.S. Fish and Wildlife Service reports that 400 endangered species shared $4 million in support in 1995, while four salmon species received over $100 million in the same year. Peter Kareiva et al., *Nongovernmental Organizations*, *in* 1 THE ENDANGERED SPECIES ACT AT THIRTY, *supra* note 94, at 176, 190. Major Puget Sound-wide efforts called Shared Strategy for Puget Sound and its successor, the Puget Sound Partnership, have been motivated by the regulatory uncertainty associated with listings of different runs of salmon. As the Shared Strategy website notes,

> In 1999, the Endangered Species Act (ESA) listings of the Chinook salmon, summer chum, and bull trout in Puget Sound brought a growing crisis to the forefront in the Pacific Northwest. Taking action to protect salmon, Federal, state, tribal and local government, along with various industries, initiated a collaborative effort to develop a long-term plan for salmon recovery in Puget Sound.

Shared Strategy for Puget Sound, Puget Sound Salmon Recovery Plan, http://www.sharedsalmonstrategy.org/plan (last visited Apr. 16, 2010).

96 Incentives to collaborate have impact in part due to what potential collaborators experience without the collaboration. In negotiation terminology, this condition is their Best

mandated goal must make sense in technical terms and be framed as an end, not a particular means to the end. Hence, a forest plan or an ecosystem law can commit public and private landowners to a conservation objective, such as abundance of a species across its range or protection of a corridor, without specifying the mechanism for achieving protection—easements, specific management practices, land acquisition, restoration or mitigation, precluding certain uses, etc.[97] Well-managed collaborative processes are very effective at finding creative, win-win type strategies when given a credible goal with the space to invent solutions and the incentives to do so.

B. Legal Mandates to Improve Accountability

Such mandates can also ensure accountability so that collaborative decision making has a scientifically-sound mechanism to test for appropriateness. Some view procedural guidelines as an adequate means of ensuring accountability and it is the case that guidance about who is at the table and their rules of engagement is important, as long as they convey reasoned procedural concerns and not simply ones that have taken bureaucratic shape.[98] However, biotic and ecosystem change is ultimately what matters (populations increase; they are genetically more robust due to migration processes, etc.) and measures of these changes need to be monitored with links back to the collaborative decision-making process. Given the lifecycle of projects described above, it is also important to define measures of progress in terms of intermediate outcomes and procedural improvements, and such measures become important proxies of appropriate direction in the near term if a project has a reasoned theory of change.[99] But definitions of progress in solely procedural and intermediate terms are not adequate to achieve accountable collaboration. Indeed, in times of fiscal retrenchment, agencies tend to retreat into their core technologies and abandon collaborative efforts.[100] Legal standards can help to keep the end-state goals in mind.

Alternative to a Negotiated Agreement (BATNA). An unattractive BATNA will motivate negotiation and collaboration. *See* ROGER FISHER & WILLIAM URY, GETTING TO YES: NEGOTIATING AGREEMENT WITHOUT GIVING IN 104, 110 (Bruce Patton ed., 1981).

97 The mandate to protect biodiversity through forest planning may be an example of this kind of guidance. *See* National Forest Management Act of 1976, 16 U.S.C. § 1604(g)(3)(B) (2006). For further discussion of how such a legal mandate may be crafted to protect migrations, see Hyman, Need & Weeks, *supra* note 76, at 413.

98 The Federal Advisory Committee Act is an example of a set of procedures that were established to guard against inappropriate collaboration, yet do little to promote effective collaboration. *See Public Participation in Environmental Decision-Making and the Federal Advisory Committee Act: Testimony Before the H. Comm. on Gov't Reform and Oversight*, 105th Cong. 6–7 (1998) (statement of J. Clarence Davies, Dir. of Ctr. for Risk Mgmt.), *available at* http://www.rff.org/rff/Documents/RFF-CTst-98-davies.pdf.

99 W.K. KELLOGG FOUND., LOGIC MODEL DEVELOPMENT GUIDE 10–11, 49 (2004), *available at* http://www.wkkf.org/~/media/6E35F79692704AA0ADCC8C3017200208.ashx.

100 *See id.* at 45.

VII. CONCLUSION

Collaborative action can result in higher levels of protection for migratory animals and the pathways through which they move. In a world of limited resources, diffuse knowledge, and geographic and political fragmentation, strategic partnerships and collaboration may be the only way to muster the expertise, resources, and power to achieve conservation outcomes. Yet the evidence from collaborative EBM is that these processes are more challenging than one might expect. Lessons from two decades of on-the-ground experience can provide guidance for future conservation.