

Managing Water: Governance Innovations to Enhance Coordination

Issue Brief

By Lynn Scarlett

1. Water Governance Challenges

Communities across the United States—both urban and rural—face water challenges related to water supply, flows, and quality; aging infrastructure; degraded watersheds and habitats; and declining wildlife populations. Several trends complicate this 21st century water management tableau. First, demands for water are increasing as a result of growing populations, water-intensive energy production, expanded agricultural production, and the imperatives of sustaining ecosystems and wildlife. Second, water issues unfold within a context of fragmented governing jurisdictions (e.g., watersheds that extend across multiple counties and states). Third, roles and responsibilities are dispersed and distributed across issues that interconnect (e.g., water and energy) and decision sectors that intersect (e.g., water transfers and the Endangered Species Act). Finally, water management is complicated by the effects of a changing climate, including changes in the amount and timing of precipitation, leading to flooding and shifts in traditional stream flows; a lengthening fire season; changes in vegetation composition that can, in turn, affect water availability and demand; and many other landscape and watershed changes.¹

Dispersed authorities, multiple agencies, diverse jurisdictions, and competing demands make coordination among water managers difficult. Yet the challenges of water management often require collective action and decisions integrated across intersecting issues and spaces and over time. Consider a few examples. Addressing water quality challenges in the Chesapeake Bay requires cooperation among 128 municipalities and multiple states. Klamath Basin discussions that attempted to resolve long-standing water supply–demand imbalances involved 50 different signatories representing 50 federal, state, tribal, local, and private-sector entities.² Discussions about the Apalachicola–Chattahoochee–Flint watersheds, relevant to addressing water constraints in the southeast, involve three states, dozens of municipalities, and multiple water users who tap water for multiple purposes.³ Management of the Colorado River involves seven states; dozens of municipalities; multiple federal, state, tribal, and local governments and agencies; and Mexico, all linked through various compacts, treaties, laws, regulations, and local ordinances.⁴

The saga of water governance and management in the United States is a long history of the episodic press for new governance structures, rule sets, tools, and forums to enhance coordination across jurisdictions, water managers, and water users.⁵ For at least a century, federal, state, and local governments have periodically established basin commissions, regional plans, and collaborative dialogues. These governing forms have varied in their durability and effectiveness. But trends that now reinforce the need for coordinated action are prompting what might be called an institutional discovery process—new governance arrangements, both formal and informal, to enhance cross-jurisdictional, public–private water planning and decisionmaking. I offer a brief summary of these innovations and a set of criteria against which to evaluate them.

2. Thinking Big but Moving Slowly—Incremental Institutional Shifts

Three main 21st century governance questions face water managers.

- **Linkages:** How can water managers enhance linkages and coordination where issues and agency missions intersect and overlap?
- **Flexibility:** How can water managers strengthen their nimbleness to adapt in the context of complexities, volatility, and uncertainties?
- **Collaboration:** How can water managers enhance collaborative decisionmaking among agencies and between agencies and the public?

Thinking “big” is not new. And, despite fractured formal authorities and jurisdictions, water managers in the United States have a long history of ventures in coordinated and cooperative management alongside frequent conflict and competition within the nation’s water basins.⁶ Some of these endeavors are codified in agreements and have accompanying institutional structures to oversee their implementation. The 1909 U.S.–Canadian Boundary Waters Treaty, for example, which provides the foundations for managing shared natural resources and resolving disputes, is implemented through an International Joint Commission.⁷ Within the United States, the Colorado River Compact of 1922 governs water rights to the river among seven states and gives implementation oversight authorities to the U.S. Secretary of the Interior.

Fast forward seven decades and one sees increased emphasis within the United States on the concept of watershed management in which ecological contours shape the decision setting. In 1995, the U.S. Environmental Protection Agency issued a report, *Watershed Protection: A Statewide Approach*, which set forth a framework for applying a watershed approach to water management within states.⁸ But critics have noted that these efforts to coordinate water management within a watershed context often lack regulatory power—particularly over land uses—and the institutional mechanisms to coordinate decisions across linked watersheds at different spatial scales.⁹

It is tempting to think that meeting coordination challenges and addressing the pesky perceptions of dysfunction require grand designs and institutional overhauls. But such efforts are fraught with peril. They require immense political capital and hold tremendous prospects for creating new dysfunctions and decision disruptions.

Experience in successful institutional innovation is often one of incremental experimentation and problem-solving. Nobel laureate Elinor Ostrom reminds us that governance “complexity is not the same as chaos.”¹⁰ Through her empirical work on managing common pool resources, she shows that the momentum for change often arises through the creativity of those within a situation who strive to modify patterns of interaction to address resource management problems. Such change also often requires a forward-looking reframing of the problem statement to open the door for new management concepts and the incorporation of broader value sets into decisionmaking. For example, over the past 100 years along the Colorado River, the problem framework has gradually evolved from a focus on the development of water resources to a broadened focus on sustainability.¹¹ Increasingly, accompanying this evolution has come a reframing of decision boundaries to extend beyond the river to ecosystems, a focus evident in the decision context of the Glen Canyon Dam Adaptive Management Plan.¹²

These institutional innovations continue to unfold elsewhere across the United States in examples that are best viewed as iterative and evolutionary changes rather than as dramatic course corrections or institutional reforms. These efforts range from relatively small-scale watershed initiatives to more complex organizational partnerships that involve large river systems. Though they vary in scale and complexity, they offer instructive ideas and concepts for coordinating water management across jurisdictional boundaries within contexts of intersecting issues and interests.

Sustaining watersheds and the ecosystems within which they are nested involves matters of governance, management, and markets. Before turning to governance, consider very briefly the matter of water management. Even within existing governance frameworks, one finds many opportunities to rethink the management of water systems. These opportunities include shifting from “grey” to “green” infrastructure for stormwater management and other urban services;¹³ integrating local water and land-use planning, as Tucson has now done through an ordinance that requires coordination on these issues;¹⁴ exploring opportunities to restore floodplains; and experimenting with flexible river and reservoir management, such as the approach pioneered by The Nature Conservancy (TNC) and the U.S. Army Corps of Engineers within several river basins to sustain water storage and flood protection while also improving ecosystem health.¹⁵ Kicked off in 1998 through a collaborative effort on the Green River in Kentucky, the Sustainable Rivers Project of TNC and the Corps resulted in the identification of revised water release protocols for a reservoir intended to benefit various mussel species, and reestablish more natural habitat and river temperatures, while also providing recreational benefits and reduced flood damage.¹⁶

Though management innovations offer potential, I turn my focus to broader considerations of governance—the institutions (governmental, quasi-governmental, and social) and rules through which water resources are managed, protected, and restored.

3. Governance Characteristics to Cultivate Linkages, Adaptability, and Collaboration

Four characteristics are important to sustaining the structures, processes, and networks through which agencies, communities, landowners, and water users can set shared goals and undertake shared actions at an ecosystem or landscape scale.¹⁷

- First, governance—both formal and informal—must provide *accountability and flexibility*. How can decisions and actions adjust to new circumstances? Adaptive management offers one technical tool intended to enable managers to adjust actions based on the establishment of clear goals, selection of management interventions, monitoring of those actions to assess their achievement of the established goals, and making course corrections, where needed. But the policy context within which adaptive management is practiced often limits the ability to make substantive course corrections. And there is a second conundrum: the public (and sometimes legal) requisites of accountability for clear outcomes produce some tensions with the pursuit of adaptability.
- Second, governance must be characterized by *inclusivity in collaboration*, accompanied by shared agreement on the processes and rules that will guide decisionmaking. Who is at

the decisionmaking table? In what capacity? How much consensus is enough? When can an idea become a decision?

- Third, governance must allow for *ongoing learning*, including ways to identify information gaps, frame questions, and generate relevant knowledge. Relevant knowledge includes not only scientific and technical knowledge, but also local and experiential knowledge that is tied to the time, place, experience, and situation.
- A final characteristic of successful network governance pertains to the broader policy context in which regulations and other decision rules shape how well participants can coordinate actions and strengthen connections. Do existing rules and authorities allow for and facilitate *coordination and collaboration*? Federal agency rules are often not well-aligned with the facilitation of partnerships, collaboration, and cross-jurisdictional actions. (Consider, for example, Federal Advisory Committee Act provisions that limit spontaneous engagement by federal agencies in certain kinds of collaborative endeavors, other policies that constrain uses of cooperative agreements, and even budgets, which are often formulated by agency rather than by resource management and restoration initiative.)

Complexities and interconnections of water systems and the ecosystems of which they are components complicate water governance and give rise, especially, to three challenges outlined earlier. How can water managers enhance linkages and coordination where issues and agency missions intersect and overlap? How can water managers strengthen their nimbleness to adapt in the context of complexities, volatility, and uncertainties? And how can water managers enhance collaborative decisionmaking among agencies and between agencies and the public?

In the context of these three questions, consider the emergence of what former Indianapolis mayor Stephen Goldsmith and his co-author William Eggers call “network governance.”¹⁸ Goldsmith and Eggers note, “Rigid bureaucratic systems that operate with command-and-control procedures, narrow work restrictions, and inward-looking cultures and operational models are particularly ill-suited to addressing problems that often transcend organizational boundaries.”¹⁹ These systems, they suggest, are not well-suited to addressing management challenges in which relevant knowledge is dispersed, the interests of multiple resource owners and users intersect, and coordination among multiple legal authorities is required. Lester Salamon has analyzed the structures and functioning of nonprofit organizations. In describing current governance challenges, he notes: “what exists in most spheres of policy is a dense mosaic of policy tools, many of them placing public agencies in complex, interdependent relationships with a host of third-party partners.”²⁰ One might add that this complex governance context also applies to the functioning of many public agencies, placing them in interdependent relationships with other public agencies and the private sector.

Resource managers increasingly flag these governance challenges as significant hurdles to achieving effective, integrated water resource management. But examining emergent models of network governance requires some sense of the governance criteria against which one might evaluate their effectiveness.

What might the future hold for watershed management and the application of network models of governance? The examples summarized below present some relevant approaches to multiparticipant, shared governance. Governance options array along a continuum of very formal collaborative organizations to very informal, organic blendings of network participants.

4. Network Governance—Facilitating Institutional Innovations

At one end of the spectrum of network governance models are initiatives that resulted in the formation of congressionally designated formal, collaborative organizations. Consider the Detroit River International Wildlife Refuge. In the 1960s, a heavily industrialized area along the river became increasingly polluted. By 1970, the entire fishing industry along several rivers and Lake Erie was closed as a result of high mercury levels. Losses resulting from these closures galvanized portions of the business community and the environmental community to undertake a river clean-up. The Wyandotte National Wildlife Refuge provided an anchor location in which to focus conservation and clean-up, but its small size made it insufficient to achieve river and habitat improvements at a meaningful scale. Ultimately, the press for a more substantial conservation “footprint” resulted in efforts to establish a larger wildlife refuge along the river. However, the existing patchwork of land ownerships and developed areas posed difficulties for the creation of a traditional national wildlife refuge comprising lands acquired and managed by the federal government. Instead, a network governance model emerged upon passage of the Detroit River International Wildlife Refuge Establishment Act, signed into law by President George W. Bush on December 21, 2001.

In passing this act, Congress designated the first international refuge and the creation of a formal governing organization—but one that displays an unusual structure of public and private lands, cross-boundary coordination, and shared projects. The refuge encompasses a mosaic of land ownerships, with management cooperation accomplished through a medley of cooperative agreements that advance the goals established in a single, comprehensive conservation and management plan. The refuge decisionmakers include both U.S. and Canadian participants.²¹



Figure 1. Detroit River International Wildlife Refuge—Formal Model of Network Governance

Notes: NGO, nongovernmental organization.

Although the Detroit River International Wildlife Refuge involves a governing network (Figure 1), it relies on a federal agency to fulfill the coordinating and oversight governance roles. Other network governance models use nonprofit organizations to fulfill these essential roles. Along a continuum of models, we see the formation of new nonprofit organizations that provide an overarching “meta-organization” of groups to coordinate action among them. Consider two examples.

First, in the Cienegas Creek watershed south of Tucson, the Sonoita Valley Planning Partnership was established in the mid-1990s to facilitate a collaborative resource management effort that included the Bureau of Land Management (BLM), local ranchers, outdoor recreation interests, environmentalists, and others. In the early 1990s, BLM had initiated a traditional planning process under the National Environmental Policy Act (NEPA) to create the Empire–Cienegas Resource Conservation Area in southeastern Arizona. Poor planning, a lack of public participation, and the exclusion of private and state trust land stakeholders in the process jeopardized the federal planning process. Shortly thereafter, citizens, local governments, and conservation groups concerned about the health of Las Cienegas Creek watershed argued that restoration must include state trust and private lands rather than just BLM lands. They formed the Sonoita Valley Planning Partnership and joined with BLM to establish (with congressional approval) Las Cienegas National Conservation Area (NCA). The Congress formally established the national conservation area in 2000 upon passage of the Act to Establish the Las Cienegas National Conservation Area.²² The partnership then developed a community-based management plan for the NCA, which was eventually adopted by BLM as the preferred alternative in the planning document for Las Cienegas NCA.

Las Cienegas NCA is now the first major BLM-administered land area to simultaneously engage community-based planning and, as of 2000, community-based implementation of the adopted plan through adaptive, outcome-based practices. The federal legislation established the Sonoita Valley Acquisition Planning District to provide for future acquisition of important conservation lands within the region. The planning district consists of 142,800 acres of land in the Arizona counties of Pima and Santa Cruz. In addition, the establishing Act created the National Conservation Area of 42,000 acres of existing public lands. The Act specifies management provisions pertaining to riparian management and water quality, grazing, access to state and private lands, motorized vehicles, hunting, and other management considerations. BLM uses planning procedures under the Federal Land and Policy Management Act to develop comprehensive management plans consistent with the goals and objectives developed through the Sonoita Valley Planning Partnership (SVVP) process, as incorporated into the NEPA plan of October 2000.

The SVVP and Las Cienegas Watershed Collaborative operate with a formal, nonprofit status, staff, and budget (Figure 2). The SVVP generates a set of shared goals and actions to be implemented in the watershed by a combination of public agencies and private entities. Facilitating this sort of collaborative effort is a NEPA process described in regulations issued by the U.S. Department of the

Interior in 2008.²³ Those regulations allow action agencies to incorporate management options developed through consensus-based, collaborative processes as the preferred alternative in NEPA deliberations.



Figure 2. Las Cienegas Watershed Collaborative: Hybrid Formal-Informal Network Model

Notes: NGO, nongovernmental organization.

A second example in which a nonprofit organization provides governance coordination is unfolding in Milwaukee and its surrounding watersheds, where the Metropolitan Sewerage District has helped create an organization to enhance collaborative watershed governance to address stormwater and flooding issues. The District provides wastewater and flood management to 1.1 million people in 28 communities serving the 1,100-square-mile Greater Milwaukee Watersheds. The District borrowed the concept of collaborative governance from the nonprofit organization, Chicago Wilderness, a regional alliance of over 250 organizations focused on enhancing local natural resources to improve quality of life in the Chicago area. The Milwaukee Metropolitan Sewerage District helped form an alliance of organizations and other participants—both public and private—with an array of different responsibilities and purposes. Giving formality to this network, the District worked with the partners to create the Southeastern Wisconsin Watersheds (or Sweet Water) Trust in 2008 to provide a context for integrated water management across southeastern watersheds.²⁴

The Sweet Water Trust's focus is to coordinate the development and implementation of watershed restoration plans by its partner organizations. Goals include improvements in water quality, aesthetics, and habitat, with a focus on regional implementation that involves actions by nongovernmental organizations, municipalities, businesses, state and local government agencies, academia, and local community groups to reduce point and nonpoint source pollution.

At the highly informal end of the network governance spectrum are loose confederations in which the individual identities and purposes of different place-based organizations operating in linked landscapes are sufficiently unique that they preclude the creation of a standing organization with specific goals (Figure 3). However, the organizations—operating across large, linked landscapes—often have some shared challenges that have given rise to loose constellations of solution-oriented joint actions. These efforts might be thought of as a series of action networks. They involve the loose affiliation of clusters of organizations and participants that form and reform around shared goals and conversations. This forming and reforming implies that issue framing is a key element that pulls disparate entities together. Action networks offer opportunities to fill action gaps and cement together intersecting agencies through linked actions. One model is the Crown of the Continent Roundtable, comprising more than 100 public, nonprofit, and private organizations, which provides an institutional home through which these organizations network across 13 million acres that run 250 miles north to south along the Rocky Mountains and cross the international boundary with Canada.²⁵ The network stimulates the generation of shared goals among all or a subset of participating organizations. These goals include projects to enhance water quality in the Flathead Basin, for example.

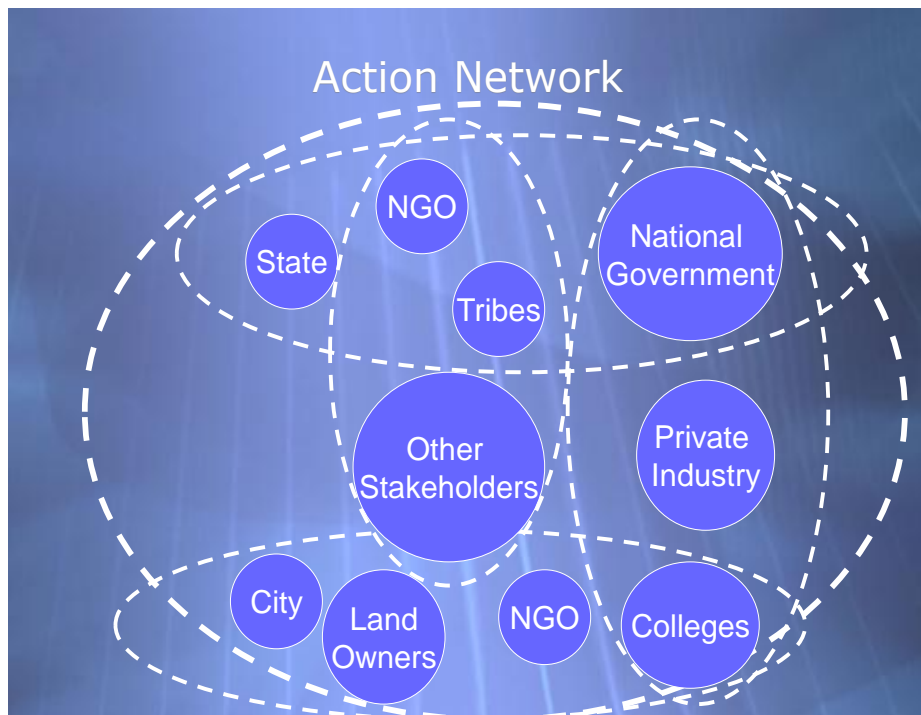


Figure 3. Crown of the Continent Roundtable: Action Network Governance Model
Notes: NGO, nongovernmental organization.

Each of these governance structures creates a context for facilitating coordination and collaboration among people and organizations that have shared goals, intersecting interests, and linked problems. Many other examples have emerged, such as the Platte River Restoration Implementation Plan and its Governance Committee, the Puget Sound Partnership, and the Walla

Walla Partnership, which was delegated authority by the State of Washington to provide local, collaborative resolution of water allocation decisions (see Appendix).

5. Thinking about Network Governance Design

Though the preceding vignettes describe three network governance models along a continuum, network governance can take on an infinite number of forms. Which form is appropriate depends on purposes, biophysical conditions, existing rules, community attributes and cultures, and the composition, duration, and needs of collaborative efforts in which people and organizations are striving to coordinate goals and actions in particular contexts.

Elinor Ostrom suggests that no single governance rule-set underpins success. She does, however, identify some principles that seem relevant.²⁶ Highlights of these principles include:

- clear decision boundaries;
- congruence with local and cumulative institutional conditions;
- clear decision rules and the delineation of the rights, roles, and responsibilities of participants;
- monitoring of users and resources;
- sanctions for improper action; and
- linkages to the larger governance context.

Former U.S. Secretary of the Interior Stewart Udall once described himself as a “troubled optimist.”²⁷ The phrase seems apt in contemplating communities, conservation, and watershed collaboration. Governance challenges are persistent, complex, and perhaps even broadening and deepening. But with the challenges come opportunities. Communities, states, tribes, and individuals are coalescing into partnered problem-solving ventures within emergent models of network governance.

These institutional innovations appear to provide instruments of coordination relevant to water management challenges that transcend jurisdictional boundaries and involve intersecting issues. Many building blocks of collaboration and network governance exist. Perhaps meeting the needs of future water management requires a mix of:

- using new management tools that emphasize integrated and adaptable water management;
- filling in governance gaps with additional networking glue; and
- identifying misalignments of specific policy tools that deter coordination and strategically (perhaps surgically) addressing them.

Appendix

Drawn from background material prepared by Lynn Scarlett, Barbara Stinson, Don Boesch, and John Ogden for the National Conference of Ecosystem Restoration, Los Angeles, California, 2009.

Conservation, Restoration and Collaboration: Network Governance Examples

The following examples illustrate models of network (sometimes referred to as “shared”) governance.

Northwest Straits Initiative and Commission

The Northwest Straits Commission provides guidance and offers resources to seven marine resources committees that represent seven counties located in Washington State along the Northwest Straits. The commission is a 13-member organization composed of gubernatorial appointees, one Secretary of the Interior appointee, and a representative from each of the seven counties in the region. The commission serves as a “board of directors” for the Northwest Straits Marine Conservation Initiative. Members represent the Marine Resources Committees, tribes, the Puget Sound Partnership, and other appointments of the Governor.

The commission mobilizes science to focus on key priorities and coordinates regional priorities for the ecosystem. The commission uses performance benchmarks established by a citizens’ group as measurable goals. Its principal work is to: (a) provide focus on the overall health of the marine ecosystem; (b) propose management recommendations to existing governmental authorities; and (c) coordinate scientific, technical, and financial support to the marine resources committees. Performance benchmarks relate to the protection and restoration of marine waters, habitats, and species of the region to achieve ecosystem health and sustainable resource use. Goals focus on marine habitats, marine life, water quality, the generation and dissemination of high-quality science, and education and outreach.

Accomplishments include surveying and monitoring of shoreline habitats, measures to report and remove abandoned fishing gear, mapping, restoration of oyster beds, and other restoration efforts. Key partners include the Puget Sound Action Team; the Washington Sea Grant Program; the Northwest Washington Treaty Tribes; the Washington State Departments of Ecology, Fish & Wildlife and Natural Resources; the National Oceanic and Atmospheric Administration; and others.

Website: www.nwstraits.org

Eastern Nevada Landscape Coalition

The Eastern Nevada Landscape Coalition, formalized in 2001, is a public–private assembly that focuses on conservation under the larger umbrella of the BLM Great Basin Restoration Initiative that funds a variety of projects to restore and maintain the Basin’s native plants and wildlife. The Eastern Nevada Landscape Restoration Project, centered in Ely, Nevada, a key component of the Great Basin Restoration Initiative, focuses restoration work on approximately 10 million acres in eastern Nevada administered by BLM. The goals of the coalition include improving or maintaining: (a) habitat condition through invasive

weed management and forest thinning, (b) watershed function and stability, (c) riparian area function and condition, and (d) species diversity and composition. The coalition also seeks to maintain and protect Native American cultural values and foster sustainable rural communities and economies.

The coalition is a nonprofit, community-based entity with more than 60 partners representing agricultural; conservation; cultural; environmental; private enterprise; and local, state, and federal government interests. The coalition assists in project planning and implementation by establishing goals and objectives, determining processes, advising on project implementation, and providing science inputs. A science committee—which includes scientists from public land management agencies, the University of Nevada–Reno, and nonprofit organizations such as TNC as well as coalition board members—outlines the research agenda, baseline data requirements, data gaps for effective monitoring, and so on.

The coalition uses cooperative agreements with BLM, some multiyear in duration, to undertake restoration and related projects. Funds come from federal, state, nonprofit, and private sources. In 2007–2008, projects impacted more than 2,194,345 acres. Data collection included inventorying roads, trails, and range utilization; recording cultural sites; inventorying minerals notices; and collecting vegetation monitoring information, especially on areas burned by fires. Actions included post-fire rehabilitation projects, rare plant protections, and invasive plant removals.

A trust, comprising BLM, cooperating agencies, community interests, and other stakeholders, provides oversight of the coalition’s activities and performance.

Website: www.envlc.org

Walla Walla Watershed Management Partnership

The Walla Walla River basin is an over appropriated system with limited water resources and critical needs to improve flows for endangered species. To address these challenges, the community came together in a collective commitment to enhance flows for fish and improve water management practices. Given this commitment, the Washington Department of Ecology supported flexible, community management of the basin provided that: (a) stream flows and water quality are enhanced and maintained to support fish and (b) any conflict is successfully handled within the basin. Through practices undertaken by the Walla Walla Watershed Management Partnership, a spring run of Chinook returned to the Walla Walla River for the first time in 80 years.

The partnership has a governance structure with clear authority and function, addressing criteria set out in the 2008 Washington State supplemental budget, which endorses “Flow from Flexibility” pilot projects to augment stream flows and use of the Walla Walla Water Bank. The partnership, launched in 2000, includes more than 30 organizations and governments, including state agencies, tribes, local governments, water user groups, conservation organizations, and others.

The partnership provides the primary governance structure for improved water management through collaboration. The partnership has a nine-member board whose members provide leadership, oversight, and decisionmaking. The board is assisted by the Policy Advisory Group and the Water Resources Panel, each of which is composed of technical experts from a range of disciplines and perspectives to ensure that

decisions are informed by science and that knowledge is shared among people in the basin. Washington's Department of Ecology has representatives on the Policy Advisory Group and Water Resources Panel. The Department also provides shared oversight of water management activities and approves water management plans jointly with the partnership.

The partnership's basic activities are funded with approximately \$450,000 annually, but additional resources are required for specific projects, planning, and water bank administration. These funds come from a variety of sources.

Website: www.wallawallawatershed.org

Platte River Recovery Implementation Program

The Platte River Recovery Implementation Program was initiated in 2007 after a decade of negotiations through a "Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitat along the Central Platte River, Nebraska." The cooperative agreement and resulting program agreement were signed by the Governors of Nebraska, Wyoming, and Colorado and by the Secretary of the Interior. In response to a history of concerns and litigation over endangered species and water uses along the river, the cooperative agreement and program were designed to establish a shared vision and responsibility for managing the central Platte River.

The broad purpose of the Platte River Recovery Implementation Program is to implement certain aspects of the U.S. Fish and Wildlife Service (FWS) recovery plan for four listed species along the river, in the context of sustainable and multiple water uses in a predominantly agricultural region. The four species are the endangered whooping crane, least tern, and pallid sturgeon and the threatened piping plover. Specific elements of the program include: (a) recovering more historical patterns of stream flow during relevant times of the year through retiming and water conservation and supply projects and (b) enhancing, restoring, and protecting habitats for the four listed species. A key component is an adaptive management plan, which provides a systematic process to test hypotheses about management strategies that will most closely achieve program objectives. Improvements in the status of the four species and associated river form and function will guide decisions about the most appropriate management strategies.

The cooperative agreement established the GC as the decision-making body for the program. The GC has 10 members, representing the three watershed states, two federal agencies (FWS and Bureau of Reclamation), water users from each of the three states, and representatives from two environmental organizations. Initially, the GC guided a planning process that culminated in a final program agreement, signed by the three governors and the Secretary of the Interior in January 2007. The GC is now responsible for implementing the program.

The GC contracts with a private natural resources consulting firm to provide an executive director and technical staff, including a chief ecologist, who report to the GC and are responsible for implementing the program. The executive director and staff work with official program advisory committees on land, water, and science issues to implement the program's land plan, water plan, and adaptive management plan. The executive director's office and the GC are advised by the Independent Scientific Advisory Committee on issues related to implementation of the program's adaptive management plan.

Website: www.platteriverprogram.org

¹ See, for example, A.L. Westerling, et al., “Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity,” *Science* 313 (2006): 940–943. On changing water patterns, see, for example, I.T. Stewart, et al., “Changes in Snowmelt Runoff Timing in Western North America under a ‘Business as Usual’ Climate Change Scenario,” *Climatic Change* 62 (2004): 217–232.

² See *Klamath Basin Restoration Agreement for the Sustainability of Public and Trust Resources and Affected Communities* (February 2010), klamathriverrestoration.org/kbra-summary.html (accessed April 9, 2012).

³ For brief descriptions see, for example, Northwest Florida Water Management District, “Alabama Coosa Tallapoosa Apalachicola Chattahoochee Flint River Basins Comprehensive Water Resources Study,” www.nwfwmd.state.fl.us/rmd/acfcomp/cstudy.htm (accessed April 9, 2012), and G. Loeffler and J.L. Meyer, “Chattahoochee–Flint River Basin,” University of Georgia River Basin Center, www.rivercenter.uga.edu/education/k12resources/basinsofga2.htm (accessed April 9, 2012). For a discussion of water management conflicts and efforts to address them through multijurisdictional initiatives, see C.-I. Lin, “Apalachicola–Chattahoochee–Flint Tri-State Negotiation,” AquaPedia, Tufts University (February 2009), <https://wikis.uit.tufts.edu/confluence/display/aquapedia/Apalachicola-Chattahoochee-Flint+Tri-State+Negotiation> (accessed April 9, 2012).

⁴ One example of the multistate complexity of Colorado River management is evident in the 2007 “shortage sharing” agreement. See Secretary of the Interior, *Record of Decision: Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead* (Washington, DC: U.S. Department of the Interior, December 2007), www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf (accessed April 9, 2012).

⁵ I use the term *governance* rather than *government* to encompass the range of formal (government) rules and structures, along with quasi-governmental and nonprofit institutions and decision rules through which decisions about resource management, including water resources, are made.

⁶ See Sarah Bates, “Bridging the Governance Gap: Emerging Strategies to Integrate Water and Land Use Planning,” *Natural Resources Journal* (forthcoming). See also, Sarah B. Van de Wetering and Robert Adler, “New Directions in Western Water Law: Conflict or Collaboration?” *Journal of Land, Resources, and Environmental Law* 20 (2000): 15.

⁷ Noah D. Hall, “The Centennial of the Boundary Waters Treaty: A Century of United States–Canadian Transboundary Water Management,” *Wayne Law Review* 54, no. 4 (2009).

⁸ U.S. Environmental Protection Agency, *Watershed Protection: A Statewide Approach*, EPA 841-R-95-004 (Washington, DC: U.S. Environmental Protection Agency, 1995), www.epa.gov/owow/watershed/state/state_approach_1995.pdf (accessed April 9, 2012).

⁹ Robert J. Mason, *Collaborative Land Use Management: The Quieter Revolution in Place-Based Planning* (Lanham, MD: Rowman and Littlefield, 2008), Chapter 6.

¹⁰ Elinor Ostrom, "Beyond Markets and States: Polycentric Governance of Complex Economic Systems," Nobel Prize Lecture, December 8, 2009, p., 412. See www.nobelprize.org/nobel_prizes/economics/laureates/2009/ostrom-lecture.html

¹¹ Although *sustainability* is a broad term used for varying purposes and with varying definitions, for my purposes in this paper in the context of water management, I use the term to refer to a decision framework in which decisionmakers seek to pursue and maintain environmental, social, and economic outcomes that endure over time.

¹² Robert W. Adler, *Restoring Ecosystems: A Troubled Sense of Immensity* (Washington, DC: Island Press, 2007).

¹³ For a description of these efforts, see Lynn Scarlett, *Green, Clean, and Dollar Smart: Ecosystem Restoration in Cities and Countryside* (Washington, DC: Environmental Defense Fund, 2010).

¹⁴ City of Tucson, "City/County Water and Wastewater Study: Integrating Land Use Planning with Water Resources and Infrastructure Technical Paper" (July 8, 2009). See also, City of Tucson, "Sustainable Land Use Code Integration Project" (December 11, 2010). See <http://cms3.tucsonaz.gov/plannews/news/sustainable-land-use-code-integration-project>

¹⁵ Ibid.

¹⁶ See Andy Warner and Brian Richter, "The Sustainable Rivers Project: Incorporating Environmental Flows into Federal Reservoir Operations," undated white paper, www.texaswatermatters.org/pdfs/sustainable_rivers.pdf (accessed April 9, 2012).

¹⁷ For a discussion of landscape-scale conservation and collaboration, see Matthew McKinney, Lynn Scarlett, and Daniel Kemmis, *Large Landscape Conservation: A Strategic Framework for Policy and Action* (Cambridge, MA: Lincoln Institute of Land Policy, 2010).

¹⁸ See Stephen Goldsmith and William Eggers, *Governing by Network: The New Shape of the Public Sector* (Washington, DC: Brookings Institution Press, 2004).

¹⁹ Ibid., 7.

²⁰ Lester Salamon, "The New Governance and the Tools of Public Action: An Introduction," in *The Tools of Government: A Guide to the New Governance*, ed. Lester Salamon (Oxford, U.K.: Oxford University Press, 2002), 3.

²¹ For a description of the refuge and its comprehensive conservation plan, see U.S. Fish and Wildlife Service "Detroit River International Wildlife Refuge Comprehensive Conservation Plan," www.fws.gov/midwest/planning/detroitriver/ (accessed April 9, 2012).

²² U.S. Congress, Public Law 106-538, December 6, 2000.

²³ 43 CFR Part 46, October 15, 2008, Implementation of the National Environmental Policy Act (NEPA) of 1969, Final Rule.

²⁴ See Southeastern Wisconsin Watersheds Trust, Inc., "About Sweet Water", www.swwtwater.org/home/about_swwt.cfm (accessed April 9, 2012).

²⁵ See Roundtable on the Crown of the Continent, "The Initiatives," www.crownroundtable.org/initiatives.html (accessed April 9, 2012).

²⁶ Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge, U.K.: Cambridge University Press, 1991).

²⁷ Interview, WGBH, PBS Program, American Experience, "Earth Days," undated, available at:

<http://www.pbs.org/wgbh/americanexperience/features/transcript/earthdays-transcript/?flavour=mobile>