EVALUATING MARKET TRANSACTIONS, LITIGATION, AND REGULATION AS TOOLS FOR IMPLEMENTING ENVIRONMENTAL RESTORATION

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I. INTRODUCTION

Restoration of degraded ecosystems and declining species is a complex public process in which the interests of environmental organizations, irrigators, logging companies, water utilities, Native American communities, and multiple layers of public agencies often conflict. Once policymakers have consulted with stakeholders, identified restoration goals, initiated scientific investigations, and developed a restoration plan, on-the-ground implementation requires two types of efforts: dedication of specific land and water resources to restoration, and changes in land and water management practices to assist restoration. For instance, restoration of an endangered fish species may require preventing development of a streamside land corridor, seasonally altering stream flows to assist fish survival,

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The research reported here was supported by a grant from the Udall Center for Studies in Public Policy and by a "Water and Watersheds" grant from the National Science Foundation/U.S. Environmental Protection Agency joint competitive grant program. The Authors appreciate assistance on footnotes and citations provided by Patricia Orr and the *Arizona Law Review.*

and modifying upstream grazing practices to reduce sediment runoff.[1] Choosing the best methods to obtain the desired modifications in water flows and land management presents a challenge to restoration advocates.

Two broad categories of mechanisms are available: *voluntary* agreements and *compulsory* changes in land and water use mandated through litigation, administrative actions, and legislation. A purely voluntary approach could involve purchasing land or conservation easements in the riparian corridor, acquiring and retiring water rights to improve stream flow levels, and providing technical and financial assistance to promote water conservation and induce upstream ranchers to modify their grazing practices. This approach can make use of several types of tools: market transactions, charitable donations, negotiated agreements, incentive pricing for water to spur conservation, and cost sharing and technical assistance to encourage changes in land and water management. Compulsory mechanisms follow the three branches of government: court orders, administrative actions, and legislative mandates. A purely compulsory approach could involve litigation and administrative actions to prevent land development, alter water diversions, and change upstream dam releases, as well as legislation mandating improved grazing practices. While this Article first emphasizes the distinctions between voluntary and compulsory approaches, it later focuses on how the two approaches may complement each other in achieving environmental restoration.

This Article provides examples of voluntary and compulsory mechanisms used to further environmental restoration in the western United States. It discusses the strengths and weaknesses of different mechanisms using seven criteria developed for comparative analysis. The Article concludes with suggestions for making effective use of these mechanisms and for strengthening the efficacy of voluntary strategies to accomplish the changes in land and water management necessary to implement restoration.

II. THE ROLE OF VOLUNTARY AND COMPULSORY MECHANISMS

The western United States provides many examples of voluntary and compulsory mechanisms to assist restoration. One approach, market acquisitions, became more common in the 1980s as the private sector, federal, state, and local government agencies, and non-profit environmental organizations all acquired land and water for restoration.[2] For instance, private fishing clubs in Colorado have leased canal company stock from irrigators to maintain lake and stream

1. *See, e.g.*, WESTERN WATER POLICY REVIEW ADVISORY COMMISSION, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 3-51 to 3-52 (1998) [hereinafter WATER IN THE WEST].

2. *See* NATIONAL RESEARCH COUNCIL, WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY AND THE ENVIRONMENT 27–37 (1992) [hereinafter WATER TRANSFERS].

levels for trout.[3] A number of western states authorize a state agency to purchase land and water rights to assist environmental restoration.[4] The Montana Department of Fish, Wildlife, and Parks has negotiated water leases in several river basins to maintain stream flows for wildlife and recreation.[5] Arizona's Heritage Fund, created by a statewide voter initiative in 1990, has acquired a number of land parcels and grazing rights in critical habitat areas.[6]

Another voluntary mechanism used to further restoration is resource donation. An opportunity for donation arose in Idaho during the unusually harsh winter of 1989. Twenty-five percent of the United States trumpeter swan population was trapped without access to food along the frozen Upper Snake River. Irrigators donated 10,000 acre-feet of storage water to break up the ice and allow the birds to feed. The arrangement was coordinated by The Nature Conservancy, which also purchased additional water for this purpose.[7]

Multi-party negotiated agreements have become a preferred tool for resolving restoration conflicts. Public officials actively encourage the use of professional mediators and alternative dispute resolution in both federal agencies and in many states.[8] Numerous multi-party negotiations are ongoing around the West.[9]

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3. *See* Bonnie G. Colby, *Benefit, Costs and Water Acquisition Strategies: Economic Considerations in Instream Flow Protection, in* INSTREAM FLOW PROTECTION IN THE WEST 6-1, 6-17 (Lawrence J. MacDonnell & Teresa A. Rice eds., revised ed. 1993).

4. *See id.* at 6-19 to 6-20.

5. *See id.* at 6-19.

6. *See* ARIZ. REV. STAT. ANN. §§ 17-296 to -298 (West 1996 & Supp. 1999) (Arizona Game and Fish Commission Heritage Fund). *See also* ARIZ. REV. STAT. ANN. §§ 41-501 to -504 (West 1999) (Arizona State Parks Board Heritage Fund). The fund sets aside $20 million annually from state lottery funds for wildlife and recreational uses, some of which have been used to acquire land for habitat. *See* Joe Gelt, *Voters Influence Water Policy with Initiatives, Referenda*, ARROYO, Dec. 1995, at 1, 1–2.

7. *See* Colby, *supra* note 3, at 6-19.

8. President Clinton issued a memorandum in 1998 ordering the formation of an interagency federal taskforce to facilitate agency use of alternative dispute resolution. *See* William J. Clinton, *Designation of Interagency Committees to Facilitate and Encourage Agency Use of Alternate Means of Dispute Resolution and Negotiated Rulemaking, Memorandum for Heads of Executive Departments and Agencies* (May 1, 1998) 1998 WL 214697. The Environmental Division of the United States Department of Justice encourages the use of alternative dispute resolution in cases for which this approach is likely to be productive. *See* Lois J. Schiffer & Rubin L. Juni, *Alternative Dispute Resolution in the Department of Justice*, 11 NAT. RESOURCES & ENV'T 11, 11 (1996). Western governors have adopted principles to encourage alternative dispute resolution. *See Governors Adopt Environmental Policy*, WESTERN GOVERNORS' REP., Apr. 1998, at 1.

9. *See* NATURAL RESOURCES LAW CENTER, UNIVERSITY OF COLORADO, THE WATERSHED SOURCE BOOK: WATERSHED-BASED SOLUTIONS TO NATURAL RESOURCE PROBLEMS 1-10 to 1-44 (1996) (providing dozens of examples of negotiations in the western United States); WATER IN THE WEST, *supra* note 1, at 3-40 to 3-44. For a

Technical assistance and cost sharing are tools to induce voluntary changes in land and water. The U.S. Department of Agriculture and the Bureau of Reclamation have ongoing programs that encourage water conservation and the adoption of management practices to reduce soil and agricultural chemical runoff into waterways.[10]

Resource pricing is another tool to motivate change in resource use patterns. Some urban water providers reward conservation and penalize excessive use through incentive pricing in their water rate structures.[11] Western United States agriculture, on the other hand, generally enjoys very low water rates with little price incentive for conservation.[12]

Among compulsory mechanisms, litigation represents one tactic for inducing land and water management changes needed for restoration. Court-rulings in favor of restoration activities not only have resolved the litigated dispute, but also have set important precedents. Examples include the 1983 decision in *National Audubon Society v. Superior Court*[13] that propelled restoration of water flows to Mono Lake in California, the Ninth Circuit rulings allowing the Secretary of the Interior to give priority to endangered fish by refusing to sell water for municipal and industrial use and to reallocate Stampede Reservoir on the Truckee River system from urban supply to fish restoration,[14] and the 1993 court ruling that has forced Texas groundwater management to protect endangered species that inhabit springs fed by the Edwards Aquifer System in the San Antonio area.[15]

Administrative actions also have assisted restoration and prevented further degradation. In 1991, the Secretary of the Interior ordered the operations of Glen Canyon Dam to be modified on an interim basis (while studies of dam impacts were ongoing) to minimize downstream impacts of dam operations on

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description of the role mediators play, see Raymond E. Tompkins, *Mediation, the Mediator, and the Environment*, 11 NAT. RESOURCES & ENV'T 27, 27–28 (1996).

10. *See* WATER IN THE WEST, *supra* note 1, at 5-28 to 5-33; Ari M. Michelsen et al., *Emerging Agricultural Water Conservation Price Incentives*, 24 J. AGRIC. & RESOURCE ECON. 222, 222–36 (1999).

11. *See* WATER TRANSFERS, *supra* note 2, at 87–91 (discussing water pricing as a negative example of incentive pricing); Sue McClurg, *Central Valley Project Improvement Act Update,* WESTERN WATER, Jan.–Feb. 2000, at 4, 9 (describing a three-tier pricing structure). *See also generally* R. Huffaker et al., *Evaluating the Effectiveness of Conservation Water-Pricing Programs*, 23 J. AGRIC. & RESOURCE ECON. 12 (1998).

12. *See* TERRY L. ANDERSON & PAMELA SNYDER, WATER MARKETS: PRIMING THE INVISIBLE PUMP 47–66 (1997).

13. 658 P.2d 709 (Cal. 1983).

14. *See* Pyramid Lake Paiute Tribe of Indians v. United States Dep't of the Navy, 898 F.2d 1410, 1420 (9th Cir. 1990); Carson-Truckee Water Conservancy Dist. v. Clark, 741 F.2d 257, 260 (9th Cir. 1984).

15. *See* Sierra Club v. Lujan, No. MO-91-CA-069, 1993 WL 151353, at *30–34 (W.D. Tex. Feb. 1, 1993).

listed species, cultural sites, and recreation.[16] In another example of administrative action, the Environmental Protection Agency vetoed a permit needed to construct Two Forks Dam to supply water for Colorado's rapidly growing Front Range. This administrative act signaled a paradigm shift in western water management, especially as urban interests had spent over forty million dollars and eight years preparing to build the dam.[17]

Legislative bodies have passed laws requiring restoration and appropriating funds to implement restoration projects. For instance, the Central Valley Project Improvement Act[18] substantially alters water allocation in California in one of the largest federal water projects in the United States.[19]

In order to highlight the roles voluntary and compulsory strategies play in furthering restoration, consider a world in which restoration could be implemented *only* through voluntary transactions and negotiated agreements, without the possibility of court rulings or administrative actions to compel changes in land and water use. Any land or water resources needed for restoration would have to be acquired through voluntary transactions and donations. Those with rights to the necessary land and water would be willing participants, so there would be no diversion of money and time to dealing with takings issues. Deals that were negotiated presumably would be implemented easily, because all parties had to consent for the agreement to be reached.

If there were no compulsory mechanisms requiring landowners and water users to assist in restoration, then the burden of negotiating acquisitions and changes in management practices would fall on those organizations spearheading restoration efforts. These organizations likely would be either non-profit advocacy groups or public agencies. Without the threat of litigation or administrative curtailment of customary water and land uses, the only motivation to stimulate right holders to participate in transactions and in voluntary changes would be money and charitable instincts toward the environment. Costs would be borne by

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16. *See* NATIONAL RESEARCH COUNCIL, RIVER RESOURCE MANAGEMENT IN THE GRAND CANYON 19–20 (1996) [hereinafter RIVER RESOURCE MANAGEMENT].

17. *See* Ed Marsten, *Ripples Grow When a Dam Dies*, HIGH COUNTRY NEWS, Oct. 31, 1994, *available at* <http://www.hcn.org/1994/oct31/dir/essay1.html>. *See also* News Release, *Environmental Defense Fund Intervenes in Two Forks Lawsuit*, Oct. 23, 1992, *available at* <http://www.edf.org/pubs/NewsReleases/1992/Oct/f_twof.html>. The EPA veto was upheld in *Alameda Water and Sanitation Dist. v. Reilly*, 930 F. Supp. 486 (D. Colo. 1996).

18. Central Valley Project Improvement Act of 1992, Pub. L. No. 102-575, § 3401, 106 Stat. 4706 (1992).

19. *See* Brian E. Gray, *The Modern Era in California Water Law*, 45 HASTINGS L.J. 249, 285–94 (1994) (explaining how the Act affects the allocation of water in California). The Act is proving problematic to implement and some agricultural interests adamantly oppose implementation. *See* CONGRESSIONAL BUDGET OFFICE, NATURAL RESOURCES AND COMMERCE DIVISION, WATER USE CONFLICTS IN THE WEST: IMPLICATIONS OF REFORMING THE BUREAU OF RECLAMATION'S WATER SUPPLY POLICIES 8–17 (1997); McClurg, *supra* note 11, at 4–7; Michelsen, *supra* note 10, at 223–24.

restoration advocates. Customary resource users, fully compensated at fair market value, would be free to accept or reject restoration-driven proposals to change the use of their land and water. They would have no compulsion to come to the negotiating table. Consequently, momentum to resolve obstacles to restoration would be lacking.

Now consider a world in which compulsory mechanisms, such as litigation, are the only avenue for obtaining land and water resources for restoration. Environmental advocates would file claims against government agencies based on public laws that protect listed species, water quality, and clean air, in an attempt to spur the agencies to fulfill their legal mandates. They also would file suits against irrigation districts, logging corporations, cities, and developers to enjoin activities that are environmentally harmful.[20] Advocates also would lobby for legislation requiring changes in dam operations and for new agency rules requiring improved management of rangelands and mandatory agricultural water conservation. Instead of money being used to buy critical habitat and water rights, resources would be devoted to clarifying and enforcing existing law and its impact on private property values, takings, and compensation. Within this model, when a court ruling favored restoration it might require irrigators to modify their diversions in favor of fish runs. However, if the court failed to capture the subtleties of what the particular fishery restoration project actually required, and the actions it ordered did not match restoration needs, then restoration advocates would be forced back to court to seek improved mandates.

To summarize, both compulsory and voluntary mechanisms have been used to assist restoration in the western United States. When one considers a hypothetical situation in which only compulsory mechanisms or only voluntary mechanisms are available, the disadvantages of each approach become more apparent. Market transactions and other voluntary approaches may not provide sufficient incentive for land and water users to make changes that are adequate to achieve restoration goals. On the other hand, litigation and other compulsory strategies tend to be bitterly contested, diverting resources away from actual progress to achieve restoration.

III. COMPARING THE EFFECTIVENESS OF VOLUNTARY AND COMPULSORY STRATEGIES

Comparing and evaluating voluntary and compulsory approaches requires criteria. The criteria presented below were developed as part of a framework for evaluating "success" in resolving environmental disputes.[21] The framework

20. *See, e.g.*, National Audubon Soc'y v. Superior Court, 658 P.2d 709 (Cal. 1983); Sierra Club v. Lujan, No. MO-91-CA-069, 1993 WL 151353 (W.D. Tex. Feb. 1, 1993).

21. *See* TAMRA P. D'ESTRÉE & BONNIE G. COLBY, GUIDEBOOK FOR ANALYZING SUCCESS IN ENVIRONMENTAL CONFLICT RESOLUTION CASES 1–38 (review draft 2000) (manuscript on file with the Authors).

compares how litigation, administrative remedies, legislation, and mediation perform as dispute resolution mechanisms.[22]

Evaluation of differing approaches to settling environmental conflicts has become important for several reasons. First, policymakers and the public seek accountability for the manner in which environmental conflicts are resolved. Public agencies often are stakeholders in conflicts, public resources are expended in addressing conflicts, and issues of public interest—such as air and water quality, endangered species, and management of public lands—frequently are the subject of the disputes. Public officials and taxpayers want to know how much money, time, and other resources were expended and whether the costs incurred were justified by the positive outcomes of the dispute resolution process. Second, stakeholders in environmental disputes can learn from analysis of prior cases what strategies are most effective in resolving the case at hand. Finally, attorneys and mediators can improve their professional skills and abilities to counsel their clients by evaluating the effectiveness of different mechanisms in resolving prior disputes.

The first three criteria examine the costs of achieving an outcome in a particular dispute (an outcome such as a court ruling or a negotiated agreement), and the costs of implementing that outcome. Restoration projects can be expensive and costs are a key concern in evaluating different strategies to implement restoration. One reason to examine actual costs in parallel sets of similar cases that were resolved using different processes is to learn whether one mechanism, such as litigation, is much more costly than other approaches, such as negotiating a multi-party agreement. Rigorous comparison of costs is difficult to achieve given limited data, and the absence of comparable data from similar cases resolved using different mechanisms. However, over time, with a sufficiently large number of carefully documented cases, it will be possible to more thoroughly compare the costs of litigation, mediation, administrative actions, legislative remedies, and other means to resolve environmental disputes.[23]

Costs of the process used to achieve an outcome must be "reasonable." *Process costs* are reasonable if they are in proportion to the magnitude of the restoration problem and the values at stake. Process costs include money, staff time, and other negotiation and litigation expenses. While litigation has the reputation of being expensive relative to other strategies, preliminary cost data from water conflicts in the western United States are insufficient to either validate or disprove the assumption that litigation is more expensive than negotiating a

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22. The full body of criteria that was developed, along with a research instrument for collecting the data needed for evaluation, are reported in D'ESTRÉE & COLBY, *supra* note 21, at 1–38. Only a few of the full set of 26 criteria are discussed here.

23. The framework in D'ESTRÉE & COLBY, *supra* note 21, is intended to provide a standardized method of documenting complex disputes so that multiple cases can readily be compared and evaluated. Many of the ideas expressed here stem from the Authors' work in that document.

settlement.[24] Process costs of litigation and negotiation may be similar because the pursuit of voluntary strategies often is accompanied by preparations to litigate in the event that negotiations break down. Preparation for litigation also provides a credible threat of legal action in order to further negotiations.

Cost-effective implementation is the second criterion. Implementation costs are likely to be higher under court rulings because courts are not required to consider costs as an element in crafting their ruling.[25] Rather courts are focused on rights and on consistency with the existing body of law. In contrast, legislative mandates, administrative actions, and agreements negotiated among stakeholders are more likely to carefully weigh costs because of a political desire to limit financial burdens on taxpayers, firms, and property owners, and because those parties negotiating the agreement will bear some or all of the costs themselves.[26] To date, only anecdotal and incomplete data is available on process and implementation costs for a cross section of cases, so the rationales offered to explain cost differences and similarities cannot be verified empirically.

Cost comparisons are further confounded by the fact that stakeholders receive different outputs for the money they invest in different processes. In litigation, the ideal payoff for restoration advocates is a ruling that both favors their position in the particular case at hand and sets favorable precedent for future disputes. In market transactions, the payoff is acquisition of the land and water needed for a site-specific restoration project. Investments in different strategies provide differing types of results.

With respect to the next criterion, *fair distribution of costs* among parties, there are clear differences between voluntary and compulsory approaches. In a voluntary process, the primary burden is on those parties seeking to effect restoration. They must call the relevant stakeholders together and initiate a bargaining process. They must offer sufficiently attractive financial or other inducements to persuade rights holders to sell or lease their land and water or to donate conservation easements and consent to changes in dam operations and land management.[27] In a litigation framework, the burden of initiating litigation also falls on the restoration advocates. However, once the legal process is set in motion and begins to be taken seriously by affected parties, they too must spend money on attorneys, experts, and court costs. The cost burden is spread among the stakeholders, providing impetus to settle the problem. The "fairness" of different cost distributions depends on the benefits different parties obtain from restoration, and perceptions of fairness will vary among stakeholders.

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24. *See* Bonnie G. Colby, *Negotiated Transactions as Conflict Resolution Mechanisms: Water Bargaining in the U.S. West*, *in* MARKETS FOR WATER: POTENTIAL AND PERFORMANCE 77, 80–92 (K. William Easter et al. eds., 1998).

25. *See* DAVID L. HOROWITZ, THE COURTS AND SOCIAL POLICY 34–35 (1977).

26. *See id.* at 35.

27. *See* WATER TRANSFERS, *supra* note 2, at 27–36.

Flexibility is another criterion for evaluating strategies to accomplish restoration. Flexibility refers to the plan's ability to adapt to changing conditions and unexpected events. Water and land management must be responsive to genuine restoration needs, to changes over time in the site, and to changes in needs of the species that are the subject of the restoration effort. Negotiated agreements, legislative solutions (which generally require multi-party bargaining in order to be enacted), and agency actions have begun to specifically provide for adaptive management and altering resource management in response to resource needs.[28] Adaptive management, in the last ten years, has come to be viewed as essential to the success of any ongoing restoration effort.[29]

Court rulings may not contemplate changing resource needs over time, and thus are unlikely to mandate flexibility. Consequently, litigation may be reactivated if court-ordered actions prove unsatisfactory, or are unsuited to unusual conditions like drought. Traditional conflict resolution approaches, such as litigation or market purchases of water rights, may not be sufficiently sophisticated to meet restoration needs beyond improved baseline stream flows. For instance, restoration of an aquatic ecosystem may require flows that vary seasonally and flood flows every few years to mimic the natural hydrograph.[30] A market acquisition of water rights can improve base flow conditions, but more complex, flexible arrangements with upstream dam operators and irrigation districts are needed to manage rivers in ways that approach pre-dam conditions in terms of flow levels, water temperature, and flood magnitude and frequency.

Incentive compatibility, in the signals created by a process and its outcome, means that the restoration plan generates signals that assist, rather than obstruct, restoration. Market transactions create incentives by providing a known market price for the resource being traded, e.g., water rights. That price signals to resource users that water has value beyond their own immediate use of it. Irrigators, for example, will realize that on-farm water conservation may enable them to sell or lease the water no longer needed for irrigation and this realization provides an incentive for more efficient water use.[31] Water prices set by an administrative agency can be compatible with restoration if structured to encourage careful water management.[32] However, low water prices or failure to tie water bills to water use would not provide incentives compatible with the goal of leaving more water instream to assist restoration. Judicial processes send a different type of incentive signal—deterring violation of established environmental policies that would bring the violator before the courts, with attendant costs and uncertainties.

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28. *See* WATER IN THE WEST, *supra* note 1, at 3-40 to 3-44.
29. *See* RIVER RESOURCE MANAGEMENT, *supra* note 16, at 220–21.
30. *See* WATER IN THE WEST, *supra* note 1, at 3-29.
31. *See* ANDERSON & SNYDER, *supra* note 12, at 8–12.
32. *See id.*

Different mechanisms vary in their ability to stimulate a *paradigm shift*.[33] A paradigm shift implies both a change in the way relevant actors think about restoration and adoption of new mechanisms for accomplishing restoration. Court rulings that set precedent can precipitate a paradigm shift, as the Mono Lake case illustrates.[34] Administrative actions can also be paradigm shifters, as the EPA veto of Two Forks Dam illustrates.[35] When the urban interests, which had been counting on the dam for additional water supplies, realized it was not going to be built, they developed water supply plans with more emphasis on market acquisitions and water conservation.[36] Market transactions can be path breaking when the transaction is the first of its kind in a region, for example, the first purchase and transfer of a senior water right to instream flow maintenance.[37] Innovative transactions can pave the way for more widespread use of the market to accomplish restoration by forcing policymakers to clarify how traditional water right transfer processes will be applied to a new purpose, such as environmental restoration.[38]

One of the essential characteristics of a paradigm-shifting event is that the event redefines how the parties relate by changing the bargaining power among stakeholders. A court ruling favoring restoration puts restoration advocates in a stronger bargaining position for all future negotiations. An administrative decision protecting stream flows gives river advocates a stronger voice in subsequent disputes over water management. A multi-party agreement, which alters dam operations to assist fish recovery, sends the signal that such a change can be accomplished in other river basins.

A final criterion is *improved ability to solve related problems*. The stakeholders engaged in environmental conflicts often have multiple resource problems to address together over a period of years.[39] Consequently, their ability to work together effectively can be an important asset. Negotiated agreements provide some clear advantages over compulsory processes because they engage stakeholders in identifying strategies to accomplish restoration, debating their merits, allocating the cost burden, and building consensus for a particular approach.[40] The process gives the stakeholders experience in working together and this experience can make it easier to solve the next problem that faces the group, such as the next drought or a new species listing. In contrast, litigation encourages an adversarial approach among the parties rather than a problem-solving stance.

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33. This has been termed "social system transformation" in D'ESTRÉE & COLBY, *supra* note 21, at 37.

34. *See* National Audubon Soc'y v. Superior Court, 658 P.2d 709 (Cal. 1983).

35. *See generally* Marsten, *supra* note 17.

36. *See generally id.*

37. *See* ANDERSON & SNYDER, *supra* note 12, at 112–14.

38. *See id.* at 124–30.

39. *See* Colby, *supra* note 24, at 77–93.

40. *See* WATER IN THE WEST, *supra* note 1, at 3-40 to 3-44.

In summary, these seven criteria offer a means to compare voluntary and compulsory mechanisms to accomplish restoration. Table 1 summarizes the criteria.

Table 1. Criteria for Comparing Voluntary and Compulsory Mechanisms

Criteria	VOLUNTARY Negotiated Transaction	COMPULSORY Litigation/Court Ruling
"Reasonable" Process Costs	controlled by participants	courts not required to consider costs
Cost Effective Implementation	incentives to control costs	costs not a primary consideration
"Fair" Distribution of Costs	borne by restoration advocates	distributed across litigants
Flexibility	can be tailored to case needs	court may not recognize restoration needs
Incentive Compatibility	price ⇒ value of resource	incentives not a primary consideration
Paradigm Shift	innovative transaction may be a breakthrough	precedent set for future cases
Improved Ability to Solve Subsequent Problems	builds working relationships	discourages cooperation, information sharing

IV. INTERACTIONS BETWEEN VOLUNTARY AND COMPULSORY MECHANISMS

Voluntary and compulsory mechanisms each have their advantages and weaknesses. In the United States, both are available and can complement one another. One of the key observations among researchers analyzing cases involving environmental conflict is the interplay between compulsory and voluntary strategies to further environmental protection.[41]

On the surface, a market transaction and litigation may appear to be opposite strategies. The market approach accepts existing property rights without argument and fully compensates owners who sell or lease their land and water. Litigation forces changes in land and water management and may constrain property rights or redefine rights altogether. On closer inspection, however, the

41. *See* DOUGLAS S. KENNEY & WILLIAM B. LORD, ANALYSIS OF INSTITUTIONAL INNOVATION IN THE NATURAL RESOURCES AND ENVIRONMENTAL REALM: THE EMERGENCE OF ALTERNATIVE PROBLEM-SOLVING STRATEGIES IN THE AMERICAN WEST 26–52 (1999); Colby, *supra* note 24, at 77–93.

distinctions begin to blur. Like court rulings, market transactions can generate heated reactions. This can occur when the transaction negatively affects third parties even though the buyer and seller have reached a mutually acceptable arrangement.[42] Supposedly "voluntary" agreements entered into under the threat of looming financial crisis, litigation, or regulatory change may not be purely voluntary in fact.

In many restoration efforts, two or more mechanisms are used to effect changes in resource use and management.[43] Current restoration efforts on California's San Joaquin River illustrate how distinct approaches can successfully complement each other.[44] The San Joaquin River flowed unimpeded from the Sierra Nevada Mountains to the Sacramento-San Joaquin Delta until the closing of Friant Dam in the mid-1940s. Since then, irrigation diversions in the San Joaquin Valley have created a dry stretch of nearly twenty miles along the river's course.[45] Fifteen environmental groups headed by the Natural Resources Defense Council sued the Bureau of Reclamation and irrigation districts for violations of the state Fish and Game code and for damage to the riparian ecosystem and to fish populations.[46] The parties now are engaged in pilot restoration projects, such as operating Friant Dam to mimic the pre-dam hydrograph.[47] The restoration project has changed water release patterns to benefit the riverine habitat but has not decreased the net supply of water for the Friant Water Users Authority, due to innovative water exchanges negotiated with water users in other parts of the San Joaquin Valley.[48] Several million dollars have been made available to purchase replacement water for irrigation when it becomes necessary to do so. The parties have held off further litigation while they observe progress under the negotiated restoration plan, but litigation may resume if results are unsatisfactory to restoration advocates.[49]

The interaction between market transactions, litigation, and regulatory change often proceeds as follows.[50] An environmental group or a tribal government becomes concerned with the decline in a specific resource, a riparian area for example, and starts to investigate the issue and to talk with water users whose activities are affecting the riparian corridor. The environmental advocates then find that no one is taking their concerns seriously. Nearby water users are

42. *See* WATER TRANSFERS, *supra* note 2, at 115, 150–53.

43. *See, e.g., id.* at 119–36 (discussing the Pyramid Lake case).

44. *See Re-watering the San Joaquin*, WESTERN WATER, Sept.–Oct. 1999, at 3.

45. *See id.*

46. *See* Natural Resources Defense Council v. Houston, 146 F.3d. 1118 (9th Cir. 1998); *Re-watering the San Joaquin, supra* note 44, at 3. In *Houston*, the court found for the plaintiffs on major issues and voided agricultural water district contracts with the U.S. Bureau of Reclamation for Friant Dam water. *See* 146 F.3d at 1133.

47. *See Re-watering the San Joaquin River, supra* note 44, at 3.

48. *See id.*

49. *See id.*

50. *See, e.g.*, D'ESTRÉE & COLBY, *supra* note 21, at app. D (documenting cases); WATER TRANSFERS, *supra* note 2, at 119–36.

content with the status quo and have no reason to alter their water use. The environmental or tribal advocates conclude that voluntary changes are not forthcoming and identify legal grounds to sue, such as the public trust doctrine in the 1983 Mono Lake case,[51] or the Endangered Species Act in the Pyramid Lake case.[52] Litigation commences. As discovery proceeds, resource users become convinced that the environmental or tribal advocates have a strong case and have the legal expertise and resources to win a favorable court ruling. The stakeholders begin talking and they propose and explore some changes in water use and upstream dam operations. Water users make it clear that they want to be compensated for using less water. The parties work out a partial agreement that depends on public funds for compensation, for water conservation assistance, and to support the riparian restoration projects. Together, the stakeholders work to propose and pass enabling legislation and appropriations.

Without the threat of litigation, voluntary agreements in which resource users willingly alter their customary uses of water and land to assist restoration are more difficult to achieve. Compulsory mechanisms provide the impetus for negotiated agreements and transactions. While both voluntary and compulsory approaches are available in the United States, in much of the world compulsory mechanisms are not an effective tool. Either environmental laws on which litigation can be based do not exist, or the political will and resources to enforce protective statutes are absent, so litigation is not useful in compelling changes to assist restoration.[53] Consequently, restoration advocates in much of the world must rely on voluntary agreements and negotiated transactions to accomplish their restoration goals.

For voluntary transactions to be an effective tool for restoration, action is needed at two levels. First, some organization has to take the lead in designing and implementing innovative land and water purchases or leases that are tailored to the restoration needs of a specific site. Examples include agreements that tie dam releases to fish-runs, or dry-year water contracts under which irrigation diversions can be curtailed when stream-flow levels fall below habitat requirements.[54] Second, laws and policies need to be revamped to make it easier to implement voluntary agreements and transactions. For instance, in the 1980s most western states did not provide mechanisms to acquire water rights and change their purpose and place of use to maintain instream flows.[55] Environmental advocates persisted in their early efforts to transfer water rights in order to restore streams, which induced western states to create procedures to dedicate water to instream

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51. *See* National Audubon Soc'y v. Superior Court, 658 P.2d 709, 732–33 (Cal. 1983)

52. *See* Pyramid Lake Paiute Tribe v. United States Dep't of Navy, 898 F.2d 1410, 1412 (9th Cir. 1990).

53. *See* G.J. Syme et al., *Defining the Components of Fairness in the Allocation of Water to Environmental and Human Uses*, 57 J. ENVTL. MGMT. 51, 51–53 (1999).

54. *See* WATER IN THE WEST, *supra* note 1, at 3-21 to 3-35.

55. *See* ANDERSON & SNYDER, *supra* note 12, at 111–24.

needs.[56] Policies ripe for updating today include those governing the uses of public project water, pricing structures for public project water, re-licensing of dams, and operation of public dams.[57]

V. CONCLUSIONS

A variety of tools are available to acquire the land and water needed for restoration and to change land and water management to be more conducive to restoration. However, the different tools have strengths and weaknesses. Market mechanisms, which lack the implicit threat of compulsory change, are expensive and, absent large sums of money to buy out rights holders, lack momentum. The force of law, which lacks the flexibility of negotiated transactions and agreements tailored to the specific restoration needs, is monolithic and cumbersome. This Article argues that a successful restoration strategy is one that has reasonable process costs, a cost-effective implementation plan, and costs that are fairly distributed. Successful restoration strategies provide the flexibility to adapt to changing resource needs, create incentives that are compatible with restoration goals, stimulate paradigm shifts in accomplishing restoration, and improve subsequent problem solving among stakeholders.

Effective restoration requires careful science and clear formulation of objectives. However, taking restoration plans from the drawing board to actual implementation requires strategic use of legal and economic tools to set aside resources and to modify land and water management practices.

56. *See id.* at 116–29.

57. *See id.* at 47–66; WATER IN THE WEST, *supra* note 1, at 6-2 to 6-45.