

WATER, POPULATION GROWTH, AND ENDANGERED SPECIES IN THE WEST

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INTRODUCTION

The link between three highly controversial issues in today's American West, water, urban population growth, and the protection of endangered species, has become impossible to ignore. Water, the essential element whose limited availability defines the West,¹ is the fulcrum of this relationship. Engineering marvels fueled human settlement of the arid West by bringing water to places, and at times, that nature had not. The extent to which other species depended upon the natural flows redirected by these engineering works long went unrecognized. As a result, human consumption, redistribution, and alteration of the water that once flowed in western rivers and bubbled from western springs has brought many aquatic and water-dependent species to the brink of extinction.

We are accustomed to thinking of species decline as a product of the resource-dependent industries that historically supported the West. Indeed, the decline of many western aquatic species is largely attributable to the impacts of irrigated agriculture, mining, hydroelectric power production, and

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1. See WESTERN WATER POL'Y REVIEW ADVISORY COMM'N, WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY 2-1 (1998) [hereinafter WATER IN THE WEST]. See generally JOHN WESLEY POWELL, REPORT ON THE LANDS OF THE ARID REGION OF THE UNITED STATES, WITH A MORE DETAILED ACCOUNT OF THE LANDS OF UTAH (1879); WALLACE STEGNER, BEYOND THE HUNDREDTH MERIDIAN: JOHN WESLEY POWELL AND THE SECOND OPENING OF THE WEST (1953).

logging on the West's fragile rivers.² But the new urban West also makes demands on water that conflict with the needs of other species. With both western population growth and the decline of aquatic species accelerating, conflicts between the two are certain to intensify. In the short run, we may find relatively painless ways to redistribute water from agricultural to municipal uses. But endangered species, particularly endangered aquatic species, will be part of the picture of western growth for the foreseeable future. Protecting those species will require us to confront difficult choices between competing human uses of land and water. The future of the West's human communities, as well as its natural ones, rests on these choices.

Part I of this article sets the stage, explaining the nature and extent of the conflicts over water between aquatic species and the West's growing human population, and introducing five specific conflicts that exemplify these tensions. Part II details the relevant provisions of the federal Endangered Species Act. This part goes on to explain how the ESA applies to urban water uses generally, and in particular to the conflicts introduced in the first part. Part III concludes with four lessons I believe can be drawn from attempts to address these conflicts to date.

I. THE PHYSICAL, BIOLOGICAL, AND SOCIAL SETTING OF THE CONFLICTS

A. *Population Growth in a Region of Scarce Water*

Since the pioneering nineteenth century survey work of John Wesley Powell, aridity has been recognized as the defining feature of the lands west of the hundredth meridian. Much of the West receives less than twenty inches of rainfall annually.³ Moreover, rainfall in the region is highly seasonal, and in many areas out of phase with the crop-growing season.⁴ River

2. Agricultural activities, for example, are cited as a factor in the decline of a large proportion of listed western fish species. See Michael R. Moore et al., *Water Allocation in the American West: Endangered Fish Versus Irrigated Agriculture*, 36 NAT. RESOURCES J. 319, 321 (1996).

3. See WATER IN THE WEST, *supra* note 1, at 2-1.

4. See CALIFORNIA FARM WATER COALITION, THE WATER FACT BOOK: CALIFORNIA AGRICULTURE AND ITS USE OF WATER 10 (1999).

flows are also highly variable, both seasonally and from year to year.⁵

As the frontier moved westward across these arid lands, water diversion facilitated farming and settlement. The movement of water in the West began on a relatively small scale with privately constructed and locally funded irrigation works, but escalated in the twentieth century to massive federally-financed dams and distribution systems.⁶ These "reclamation" projects, so called because they were to "reclaim" land rendered unsuitable for human use by its aridity, ultimately supported both irrigated agriculture and urban settlement of the West's driest corners.⁷

Today, the limited water of the West supports a rapidly increasing human population, heavily concentrated in a small number of large urban centers. For the past generation, the West has been the fastest-growing region in the country.⁸ Western cities, particularly those in the most arid intermountain West, continue to grow explosively,⁹ and to expand as their suburbs boom. Between the cities, the rural West too is seeing a strong influx of new residents and land-

5. See WATER IN THE WEST, *supra* note 1, at 2-3 to 2-5.

6. See, e.g., DONALD WORSTER, RIVERS OF EMPIRE: WATER, ARIDITY, AND THE GROWTH OF THE AMERICAN WEST 74-256 (1985); see also NORRIS HUNDLEY, JR., THE GREAT THIRST: CALIFORNIANS AND WATER, 1770S-1990S 63-118 (1992).

7. See WATER IN THE WEST, *supra* note 1, at 2-10 ("Urban development at present scales could not have been possible in such places as Los Angeles, Phoenix, or Las Vegas without the pipelines that connect these cities with distant rivers."); Moore et al., *supra* note 2, at 321. See generally WORSTER, *supra* note 6.

8. Between 1970 and 1995, the population of the West grew by about thirty-two percent, compared to a nineteen percent growth rate in the rest of the country. See PAMELA CASE & GREGORY ALWARD, PATTERNS OF DEMOGRAPHIC, ECONOMIC AND VALUE CHANGE IN THE WESTERN UNITED STATES: IMPLICATIONS FOR WATER USE AND MANAGEMENT 7 (1997).

9. Of the ten cities in the nation with the largest population increases between 1990 and 1996, six are located in the West. Eight of the ten cities with the largest percentage increase in population during the same period are western. See Rodger V. Johnson, *Metropolitan and Non-metropolitan Area Population Trends*, in U.S. CENSUS BUREAU, U.S. DEP'T OF COMMERCE, THE OFFICIAL STATISTICS 14 (1998). For 1995-1996, five of the six fastest-growing states, in terms of percent population gain, were located in the intermountain West. See Donald C. Dahmann & Marc J. Perry, *State Population Trends*, in *id.* at 10 (naming Nevada, Arizona, Utah, Colorado, and Idaho, and noting that outside the West only Georgia experienced comparable growth).

owners.¹⁰ Rapid growth is expected to continue throughout the West well into the twenty-first century.¹¹

The West's population expansion has been accompanied by a shift away from reliance on the resource-dependent industries that powered the region's early settlement. As late as 1940, almost half of the employment in the West was provided directly by farming, ranching, mining, and associated processing activities.¹² By the late 1970s, however, service and trade were the dominant sectors of the West's economy, far outstripping mining, agriculture, livestock production, and forestry.¹³ Since then, the service and high technology sectors have grown most rapidly.¹⁴

There appears to have been a parallel shift in social values, away from the view that the highest and best use of natural resources is to supply human material needs and towards the idea of nature as a good in itself, or as an aesthetic and recreational amenity. Professor Eric Freyfogle has aptly described the ethic of the frontier West as a consumptive one, where unutilized natural resources signaled human sloth and moral weakness.¹⁵ That those resources might serve the needs of other species or support complex and wondrous ecosystems was simply not a consideration. The consumptive ethic applied as powerfully to water as to land. Water not put to human use was considered wasted; use to the last drop in the stream was encouraged.¹⁶

10. See William E. Riebsame, Key Trends in Population and Land Use in the West 3-4 (2000) (unpublished materials prepared for Natural Resources Law Center Conference on Water and Growth in the West) (on file with author).

11. Population growth is forecast to continue at high levels in the West at least through 2025. See CASE & ALWARD, *supra* note 8, at 28-30; Paul R. Campbell, *State Population Projections*, in U.S. CENSUS BUREAU, *supra* note 9, at 12-13.

12. See CASE & ALWARD, *supra* note 8, at 1.

13. See *id.* at 10-11. See generally THOMAS M. POWER, *LOST LANDSCAPES AND FAILED ECONOMIES: THE SEARCH FOR A VALUE OF PLACE* (1996) (chronicling the transition to dominance of the service and trade sectors).

14. See CASE & ALWARD, *supra* note 8, at 12. By 1991, the service sectors of the economy were providing eighty-one percent of the jobs and sixty-eight percent of the wage income in the Rocky Mountain states. See Jan G. Laitos & Thomas A. Carr, *The Transformation on Public Lands*, 26 *ECOLOGY L.Q.* 140, 178 (1999).

15. See Eric T. Freyfogle, *The Owning and Taking of Sensitive Lands*, 43 *UCLA L. REV.* 77, 96 (1995).

16. See Eric T. Freyfogle, *Water Rights and the Common Wealth*, 26 *ENVTL. L.* 27, 41-42 (1996); Harrison C. Dunning, *Confronting the Environmental Legacy*

In recent years, however, polling data has consistently shown that Americans view protecting the environment as more important than maximizing economic growth.¹⁷ This support extends to westerners generally, and even to those who owe their living to traditional western extractive industries.¹⁸ Modern westerners view the environment as one of the region's unique and attractive features.¹⁹

The transition from a resource-based economy to a service economy emphasizing environmental amenities should represent a boon to the environment. It does not, however, automatically solve the conflict between human desires for water and the needs of other species.²⁰ Notwithstanding their professed concern for nature, residents of the West's expanding cities and suburbs demand large amounts of water, not just for their household needs but also to supply the industries at which they work, to support the recreational activities at which

of Irrigated Agriculture in the West: The Case of the Central Valley Project, 23 ENVTL. L. 943, 950 (1993).

17. See Gallup/CNN/USA Today Poll, Apr. 14, 1999, available in WESTLAW, Poll database (showing sixty-seven percent of respondents agreed that protection of the environment should take priority, even at the risk of curbing economic growth); GALLUP POLL MONTHLY, Apr. 1998, at 43 (showing similar results); National Opinion Research Center, General Social Survey, 1996, available in WESTLAW, Poll database (showing fifty-seven percent of respondents agreed strongly or somewhat with the statement that "[n]atural environments that support scarce or endangered species should be left alone, no matter how great the economic benefits to your community from developing them commercially might be."). See also CASE & ALWARD, *supra* note 8, at 245 (reporting that survey respondents strongly agreed that "[n]ature has as much right to exist as people," and strongly disagreed that "[f]orests are valuable only if they produce jobs and income for people").

18. One survey found that majorities of groups ranging from members of Earth First to Oregon sawmill workers agreed that "[w]e should be more concerned about the environment than the economy because if the environment is all right we can at least survive, even if the economic system is not in good shape." WILLETT KEMPTON ET AL., ENVIRONMENTAL VALUES IN AMERICAN CULTURE 42 (1995). Large majorities of each group disagreed with the proposition that animals and plants exist only to serve human needs. See *id.* at 102.

19. See CASE & ALWARD, *supra* note 8, at 20. Professor Tarlock describes the West's natural features as its new commodities. See A. Dan Tarlock, *Can Cowboys Become Indians? Protecting Western Communities as Endangered Cultural Remnants*, 31 ARIZ. ST. L. J. 540, 541-42 (1999).

20. Cf. John M. Volkman, *The Endangered Species Act and the Ecosystem of the Columbia River Salmon*, 4 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 51, 69 (1996) (noting that public sympathy alone is not sufficient to restore wild salmon to the Northwest).

they play, and, in vast quantities, to keep their landscapes green and lush.

Moreover, although agriculture provides an ever-shrinking portion of the West's economic pie, agricultural water use has declined only slightly. Irrigated agriculture remains the dominant consumer of western water, accounting for nearly eighty percent of freshwater withdrawals in the western states in 1990.²¹ Other holdovers from the "old west" extractive economy, such as dams and mine tailings, also continue to harm aquatic species.

The demands of the old and new human West alone would tax the limits of the region's streams. At the same time, protection of an ever-growing number of species listed under the federal Endangered Species Act (ESA)²² demands a share of the same streams. According to the Biological Resources Division of the U.S. Geological Survey, freshwater fishes are the single most imperiled vertebrate group in the United States.²³ More than twenty percent of the animal species protected by the ESA are fish.²⁴ A large fraction of those fish are found in the West, where they occur in every major river basin.²⁵ Even more striking than the proportion of listed species that are western fish is the proportion of western fish that are in serious decline. Taking the area west of the Rocky Mountains as a whole, a recent report describes seventy percent of the native fish species

21. See WATER IN THE WEST, *supra* note 1, at 2-23 to 2-24.

22. 16 U.S.C. §§ 1531-1544 (1994).

23. See Michael A. Bogan et al., *Regional Trends of Biological Resources—Southwest*, in 2 STATUS AND TRENDS OF THE NATION'S BIOLOGICAL RESOURCES 543, 565 (U.S. Geological Survey ed., 1998) [hereinafter STATUS AND TRENDS].

24. Of 498 U.S. animals listed as of October 31, 2000, 113 were fish. See U.S. Fish and Wildlife Serv., *Threatened and Endangered Species System*, at <http://ecos.fws.gov/tess/html/boxscore.html> (last visited Nov. 2, 2000). Although fish are the most obvious example, many other declining western species are also dependent on aquatic or riparian habitats. See, e.g., Raymond Herrmann et al., *Factors Affecting Biological Resources—Water Use*, in 1 STATUS AND TRENDS, *supra* note 23, at 63, 66 (noting that nearly sixty percent of all U.S. species listed under the ESA are aquatic or riparian); see also Moore et al., *supra* note 2, at 320 n.6 and sources cited therein (explaining that water development has been identified as a cause of decline for roughly one-third of all species listed under the ESA).

25. Of the 113 listed U.S. fish species, fifty-four occur exclusively in the mainland West. The only U.S. populations of another eighteen are found in the West, and four more occur both west and east of the hundredth meridian. See 50 C.F.R. §§ 17.11-17.12 (1994). Moore et al., *supra* note 2, at 328-29, document the spread of western endangered fish across the major river basins.

as already extinct or currently imperiled.²⁶ Every part of that region shows a similar picture. For example, well over half the fish that evolved in California are extinct or on the road to extinction.²⁷ In the Great Basin, nearly two-thirds of the native fish are listed under the ESA, candidates for listing, or considered species of concern by the U.S. Fish and Wildlife Service (FWS).²⁸

It may come as a surprise that, according to a recent scientific study, the single most dire threat to western aquatic species today is one not directly related to water development. That dubious honor apparently now belongs to the rampant invasion of exotic fish, many deliberately imported, which compete with, prey upon, and hybridize with western natives.²⁹

Nonetheless, water projects run at least a close second in harmful effects.³⁰ Dams, reservoirs, and water diversions have all played key roles in the demise or near-demise of various western fish. Dams built to supply electricity, control floods, and store water for agricultural and municipal uses block access to miles of streams, impeding historic migration and spawning routes.³¹ By changing depth and rate of flow, dams and the reservoirs behind them alter water temperature and

26. See W.L. Minckley et al., *Sustainability of Western Native Fish Resources*, in AQUATIC ECOSYSTEMS SYMPOSIUM: A REPORT TO THE WESTERN WATER POLICY REVIEW ADVISORY COMMISSION 63, 73 (W.L. Minckley ed., 1997).

27. See Stephen D. Veirs, Jr. et al., *Regional Trends of Biological Resources—California*, in 2 STATUS AND TRENDS, *supra* note 23, at 593, 620.

28. See Peter F. Brussard et al., *Regional Trends of Biological Resources—Great Basin-Mojave Desert Region*, in 2 STATUS AND TRENDS, *supra* note 23, at 505, 519.

29. See Brian D. Richter et al., *Threats to Imperiled Freshwater Fauna*, 11 CONSERVATION BIOLOGY 1081 (1997).

30. See Moore et al., *supra* note 2, at 324–25 (reporting that “physical habitat alterations” including water diversions, dams, reservoirs, channelling and watershed disturbances are the most frequently cited threat in regulations listing fish species). Actually, the effects of non-indigenous species and those of water projects are closely interrelated. Changes in flow, temperature, and chemistry produced by water projects have exacerbated many of these invasions. See, e.g., WATER IN THE WEST, *supra* note 1, at 2-13 (“Native fish also have been threatened by the introduction of aggressive non-native species, many of which are more suited to river environments altered by dams.”); INDEPENDENT SCIENTIFIC GROUP, RETURN TO THE RIVER: RESTORATION OF SALMONID FISHES IN THE COLUMBIA RIVER ECOSYSTEM 150 (prepublication copy 1996) (“Direct human alteration of riverine ecosystems in the Columbia Basin has massively promoted the proliferation of non-native fish species.”).

31. See WATER IN THE WEST, *supra* note 1, at 2-12 to 2-13; see also *infra* text accompanying note 90.

chemistry.³² They also disrupt seasonal flows, sediment loadings, and river channel patterns.³³

Diversion of water from natural channels has reduced in-stream flows in places to levels insufficient to support aquatic life. Portions of many of the West's major river systems regularly fall below thirty percent of historic average annual flows,³⁴ and some channels have been completely deprived of water. Even when they do not reach such extreme levels, withdrawals can alter water temperatures, flow regimes, and water quality in ways deleterious to aquatic species. Municipal water consumption, although still dwarfed by agricultural use,³⁵ accounts for a growing share of the total. Between 1960 and 1990, the amount of water withdrawn for domestic use more than doubled, growing faster than the region's population.³⁶

Water pollution, primarily in the form of addition of sediment and nutrients to waterways, also poses a significant threat to aquatic species.³⁷ Agriculture remains the primary culprit in harmful water pollution, but urban pollution is a growing problem. Urbanization decreases water quality, as runoff no longer slowed by vegetation washes pollutants directly into streams.³⁸ Point source pollution also affects the

32. See NATIONAL RESEARCH COUNCIL, UPSTREAM: SALMON AND SOCIETY IN THE PACIFIC NORTHWEST 229 (1996) [hereinafter UPSTREAM].

33. See WATER IN THE WEST, *supra* note 1, at 2-12 to 2-13. Minckley et al., *supra* note 26, at 65-66, contains a concise but striking description of the variety of ill effects visited upon aquatic species by historic and recent water development in the West.

34. See Moore et al., *supra* note 2, at 323.

35. Of the total of 179 million acre-feet of freshwater withdrawn in the West in 1990, agriculture accounted for 140 million. See WATER IN THE WEST, *supra* note 1, at 2-6. Agriculture accounted for an even larger proportion, ninety percent, of water consumed (as opposed to used and then returned to the streams) in the West. See *id.* at 2-24.

36. See *id.* at 2-25. By 2020, urban water demand in California is projected to rise to 10.5 million acre-feet (maf), while agricultural demand declines to 25 maf. See DEPARTMENT OF WATER RESOURCES, CALIFORNIA WATER PLAN UPDATE (DRAFT) 10 (Nov. 1993) [hereinafter CALIFORNIA WATER PLAN UPDATE].

37. See generally Richter, *supra* note 29.

38. See U.S. ENVTL. PROT. AGENCY, WATER QUALITY IN THE WEST 142 (1998). Urban growth also tends to reduce available aquatic habitat by encouraging stream channelization and other alterations. See, e.g., Determination of Threatened Status for Bull Trout in the Coterminous United States, 64 Fed. Reg. 58,910, 58,921-22 (Nov. 1, 1999) (identifying urbanization as a threat to Puget Sound bull trout populations, based on habitat changes and reductions in water quality and quantity). Flood control and recreation pressures associated with ur-

West's streams. Municipal wastewater treatment plants, in particular, are a major source of pollution already.³⁹ Rapidly growing populations can only increase the stress on wastewater infrastructure.

B. Five Examples of Conflict Between Growing Cities and Declining Aquatic Species

A brief survey of five current conflicts between endangered species and the growing population centers of the West over limited water resources illustrates the range and extent of those conflicts. These examples span the region, extending from the Pacific Coast to the hundredth meridian and from the Canadian border to the Mexican boundary. They are intended to be illustrative, not exhaustive. Similar conflicts pervade the West.

1. The Edwards Aquifer

Just east of the hundredth meridian that marks the boundary of the mythic West, San Antonio perches above the Edwards Aquifer. Running more than 176 miles through porous limestone, the Edwards Aquifer provides water for both municipal and agricultural uses.⁴⁰ San Antonio, with a popula-

ban populations can also create water quality problems. See, e.g., Threatened Status for the Santa Ana Sucker, 65 Fed. Reg. 19,686, 19,691-93 (Apr. 12, 2000) (identifying flood control, urbanization, and recreational activities on public lands as threats to the species); Final Rule to List the Devils River Minnow as Threatened, 64 Fed. Reg. 56,596, 56,603 (Oct. 20, 1999) (identifying runoff from a municipal golf course as a threat); Final Rule to List the San Bernardino Kangaroo Rat as Endangered, 63 Fed. Reg. 51,005, 51,010 (Sept. 24, 1998) (listing flood control projects among the threats to the species).

39. See U.S. ENVTL. PROT. AGENCY, *supra* note 38, at 140.

40. See Todd H. Votteler, *The Little Fish that Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Texas Edwards Aquifer*, 28 ENVTL. L. 845, 845-47 (1998); see also Ronald A. Kaiser & Laura M. Phillips, *Dividing the Waters: Water Marketing as a Conflict Resolution Strategy in the Edwards Aquifer Region*, 38 NAT. RESOURCES J. 411, 414-15 (1998). The two uses take roughly equal proportions of the water pumped from the aquifer. Municipal and industrial uses in the San Antonio region accounted for roughly forty-seven percent of the pumping from the aquifer in 1988, with agricultural uses in the surrounding rural areas accounting for the remainder. See *id.* at 418.

tion over 1.5 million,⁴¹ is the largest municipal area in the United States to depend on a single aquifer for its water supply.⁴²

The Edwards Aquifer is not static; it flows rapidly enough to be considered an underground river.⁴³ This flow culminates in a series of springs, the most important of which are the San Marcos and Comal Spring systems. Historically the largest in the southwestern United States, these springs, or rather complexes of springs, emerge from the Aquifer's northeastern corner to feed the Guadalupe River.⁴⁴ Their constant temperature and flow has given rise to a unique aquatic ecosystem, characterized by extraordinarily high levels of biotic diversity.⁴⁵ Many of the species that live underground in the aquifer and in the flow from the springs are found nowhere else in the world.⁴⁶

Heavy demands on the aquifer, however, have placed the springs' ecosystem at risk. Diminished spring flows, together with urbanization, recreational water uses, pollution, and introduction of exotic species threaten the species that depend on the springs. Seven are presently listed as endangered, and an eighth as threatened.⁴⁷ According to FWS, several others may be near extinction, but too little is known about them to assess their status with any confidence.⁴⁸

41. See U.S. Census Bureau, U.S. Dep't of Commerce, *Metropolitan Area and Central City Population Estimates for July 1, 1999 and April 1, 1990 Population Estimates Base* <http://www.census.gov/population/estimates/metro-city/ma99-05.txt> (Oct. 20, 2000) (estimating July 1999 population of San Antonio metropolitan area at 1,564,949).

42. See Kaiser & Phillips, *supra* note 40, at 419. The population of the area is expected to increase by about forty percent by 2010. See U.S. FISH & WILDLIFE SERV., U.S. DEPT. OF INTERIOR, SAN MARCOS AND COMAL SPRINGS AND ASSOCIATED AQUATIC ECOSYSTEMS (REVISED) RECOVERY PLAN 16 (1996) [hereinafter SAN MARCOS RECOVERY PLAN]. Nearby Austin was the seventh fastest-growing city in the nation between 1990 and 1996. See Johnson, *supra* note 9, at 14.

43. See SAN MARCOS RECOVERY PLAN, *supra* note 42, at 11.

44. See Votteler, *supra* note 40, at 848, 857.

45. See SAN MARCOS RECOVERY PLAN, *supra* note 42, at 6.

46. See *id.*

47. The endangered species are the Peck's cave amphipod, Comal Springs riffle beetle, Comal Spring dryopid beetle, Texas blind salamander, San Marcos gambusia, fountain darter, and Texas wild rice. The San Marcos salamander is threatened. See 50 C.F.R. §§ 17.11-17.12 (1999).

48. See SAN MARCOS RECOVERY PLAN, *supra* note 42, at 6.

2. The Middle Rio Grande

Further west, on the banks of the Rio Grande, Albuquerque too relies entirely on wells for its municipal water supply.⁴⁹ Because it is unsustainably mining its aquifer, Albuquerque plans to switch to a surface water supply. Although the Rio Grande itself is fully appropriated,⁵⁰ Albuquerque has rights to water imported by a federal transbasin project, the San Juan-Chama Project. It views that water as the key to its future.⁵¹

The San Juan-Chama Project, in operation since 1972, brings up to 110,000 acre-feet annually from tributaries of the Colorado through twenty-seven miles of tunnels under the Continental Divide and across the New Mexico border, emptying it into the Heron Reservoir in the Rio Grande valley.⁵² In addition to Albuquerque, several other New Mexico cities, including Las Cruces, one of the fastest-growing cities in the country,⁵³ are counting on water from the San Juan-Chama project to relieve them from reliance on overtaxed aquifers.⁵⁴

By 1993, between one-third and two-thirds of the native fish species had been extirpated from the middle Rio Grande.⁵⁵ The future of diversions in the middle Rio Grande has been in doubt since 1994, when the Rio Grande silvery minnow was listed as endangered.⁵⁶ Once widespread throughout the basin, the silvery minnow is now limited to the middle stretch of the

49. See Denise D. Fort, *Restoring the Rio Grande: A Case Study in Environmental Federalism*, 28 ENVTL. L. 15, 29 (1998); Gary A. O'Dea, Albuquerque's Endangered Species Challenges 1 (unpublished materials from the American Bar Association Section of Environment, Energy, and Resources Eighteenth Annual Water Law Conference, Feb. 2000) (on file with author).

50. Furthermore, the waters of the Rio Grande are allocated by international treaties and interstate compacts which require that water remain in the river to serve downstream uses. See Albert E. Utton, *Coping with Drought on an International River Under Stress: The Case of the Rio Grande/Rio Bravo*, 39 NAT. RESOURCES J. 27 (1999).

51. See O'Dea, *supra* note 49, at 2.

52. See CHARLES WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST* 222-23 (1992). The enabling legislation for the San Juan-Chama Project is the Act of June 13, 1962, Pub. L. No. 87-483, 76 Stat. 97 (1962).

53. See Johnson, *supra* note 9, at 14.

54. See Fort, *supra* note 49, at 24.

55. See *id.* at 22 (quoting BIOLOGICAL INTERAGENCY TEAM, *MIDDLE RIO GRANDE ECOSYSTEM: BOSQUE BIOLOGICAL MANAGEMENT PLAN* 40 (1993)).

56. See Final Rule to List the Rio Grande Silvery Minnow as an Endangered Species, 59 Fed. Reg. 36,988 (July 20, 1994).

river, where much of its remaining habitat is subject to annual dewatering.⁵⁷ As early as 1989, the U.S. Forest Service reported that instream flows in the Rio Grande were insufficient to meet the needs of wildlife, even without any additional off-stream demands.⁵⁸ During the drought of 1996, diversion by irrigators of virtually the entire flow of the river in this stretch reportedly killed more than forty percent of the species' population.⁵⁹

3. The Colorado River Basin

The Colorado River flows for nearly fifteen hundred miles through seven western states (Wyoming, Utah, Colorado, New Mexico, Arizona, Nevada, and California) before crossing the border into Mexico. Historically, the waters of the Colorado raged through the canyons in spring and fell to a trickle in summer and fall.⁶⁰ The cold spring floods carried massive quantities of sediment to enrich the lands at the river's mouth. Summer flows ran clear, but very hot.⁶¹ These stressful conditions produced a unique aquatic biota; only eight species of fish lived in the Colorado River canyons, six of them found nowhere else.⁶²

Today, the Colorado has been transformed from one of the wildest river systems in the world, prone to extremes of flow,

57. See *id.* at 36,992. In its subsequent rule designating critical habitat for the minnow, FWS explained: "Historically, the silvery minnow was able to withstand short periods of drought primarily by retreating to pools and backwater refugia, and swimming upstream to repopulate upstream habitats. However, when the river dries too rapidly and dams prevent upstream movement, the minnow becomes trapped in dewatered reaches and generally dies." Final Designation of Critical Habitat for the Rio Grande Silvery Minnow, 64 Fed. Reg. 36,274, 36,275 (July 6, 1999).

58. See R.W. GULDIN, AN ANALYSIS OF THE WATER SITUATION IN THE UNITED STATES: 1989-2040 (1989), cited in WATER IN THE WEST, *supra* note 1, at 2-13 to 2-14.

59. See Greg Hanscom, *A Tiny Fish Cracks New Mexico's Water Establishment*, HIGH COUNTRY NEWS, Oct. 11, 1999, available at http://www.hcn.org/servlets/hcn.Article?article_id=5305.

60. See Scott K. Miller, *Undamming Glen Canyon: Lunacy, Rationality, or Prophecy?*, 19 STAN. ENVTL. L.J. 121, 125 (2000) (stating that natural flows varied from as much as 400,000 cubic feet per second (cfs) in the spring to as little as 1,000 cfs in late summer and fall).

61. See *id.* at 126.

62. See *id.* at 127.

temperature, and sediment load, to one of the most controlled.⁶³ Dams, reservoirs, and pipes smooth out the river's historic variations while transporting its waters hundreds of miles to serve distant farms and population centers. The Colorado and its tributaries provide domestic water for more than twenty-five million people in the United States.⁶⁴ The Colorado system also irrigates more than one million acres of agricultural land,⁶⁵ and generates twelve billion kilowatt hours of electricity annually.⁶⁶ Its waters are apportioned according to the "Law of the River," a complex accretion of interstate compacts, federal statutes, an international treaty, and court decisions.⁶⁷ Like the Rio Grande, the waters of the Colorado are already fully allocated,⁶⁸ yet the cities that depend upon those waters continue to grow.

The dams and diversions that dot the Colorado have radically altered nearly every feature of the aquatic environment, including water temperature, sediment load, and accessibility to migrating fish.⁶⁹ Four fish endemic to the Colorado basin have been listed as endangered.⁷⁰ The fate of other species, in-

63. See Lawrence J. MacDonnell & David H. Getches, *Colorado River Basin*, in 6 WATERS AND WATER RIGHTS 9 (Robert Beck ed., 1995); Mary Christina Wood, *Reclaiming the Natural Rivers: The Endangered Species Act as Applied to Endangered River Ecosystems*, 40 ARIZ. L. REV. 197, 209-10 (1998).

64. Denver, Salt Lake City, Phoenix, Tucson, Las Vegas, Los Angeles, and San Diego all rely heavily on Colorado River water. See David H. Getches, *Competing Demands for the Colorado River*, 56 U. COLO. L. REV. 413, 428 (1985); Mark James, *Increasing Southern Nevada's Water Supplies—A Challenge of Law and Politics*, NEV. LAW., Nov. 1998, at 21, 22. Municipal and industrial uses account for more than one-third of the consumption of Colorado River water. See David H. Getches, *Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Institution*, 68 U. COLO. L. REV. 573, 589 (1997) [hereinafter Getches, *Colorado River Governance*].

65. See Eric L. Garner & Michelle Ouellette, *Future Shock? The Law of the Colorado River in the Twenty-First Century*, 27 ARIZ. ST. L.J. 469, 469 (1995); Colorado River Water Users Ass'n, *The Colorado River at a Glance*, at http://crwua.mwd.dst.ca.us/tcr/crwua_tc.htm (last visited Nov. 2, 2000).

66. See Colorado River Water Users Ass'n, *Power at a Glance*, at http://crwua.mwd.dst.ca.us/pwr/crwua_pw.htm (last visited Nov. 2, 2000). This electricity produces substantial revenue, even though by law it is sold for considerably less than market rates. See Getches, *Colorado River Governance*, *supra* note 64, at 652.

67. See Getches, *Colorado River Governance*, *supra* note 64, at 582.

68. See Garner & Ouellette, *supra* note 65, at 472-73; WATER IN THE WEST, *supra* note 1, at 2-13 to 2-14.

69. See MacDonnell & Getches, *supra* note 63, at 38-39.

70. They are the razorback sucker, bonytail chub, Colorado pikeminnow, and humpback chub. See 50 C.F.R. § 17.11 (1999).

cluding the endangered southwestern willow flycatcher, is also tied to management of the Colorado's waters.⁷¹

4. The California Bay/Delta

Although some goes to slake the thirst of urban Southern California, most of the Colorado River water that reaches California is allocated to agricultural use.⁷² A far more important source of water for California's cities is the Sacramento-San Joaquin Delta, which empties into San Francisco Bay. "The Delta is the hub of California's water distribution system,"⁷³ engineered to compensate for the drastic differences between the distribution of population and runoff in the state. About three-quarters of the natural runoff in California occurs north of Sacramento, but about eighty percent of the water demand, agricultural and urban, lies to the south.⁷⁴

An enormous plumbing system centered in the Delta redistributes this water to meet demand. Nearly half the runoff in the state flows to the Delta via the Sacramento and San Joaquin Rivers.⁷⁵ From there, massive pumps divert water to two major projects, the Central Valley Project and the State Water Project, which distribute water throughout the urbanized portions of the state, from the San Francisco Bay Area south.⁷⁶ The Delta pumps, capable of moving eleven thousand cubic feet per second, supply water for two-thirds of California's human population,⁷⁷ as well as much of its diverse and profitable agriculture.⁷⁸

71. See Final Rule Determining Endangered Status for the Southwestern Willow Flycatcher, 60 Fed. Reg. 10,694 (Feb. 27, 1995).

72. See Garner & Ouellette, *supra* note 65, at 480 (stating that 3.85 million acre-feet (maf) of California's 4.4 maf entitlement are designated for agricultural use).

73. Elizabeth Ann Rieke, *The Bay-Delta Accord: A Stride Toward Sustainability*, 67 U. COLO. L. REV. 341, 343 (1996).

74. See CALIFORNIA WATER PLAN UPDATE, *supra* note 36, at 47.

75. See Rieke, *supra* note 73, at 343.

76. For a concise description of the Central Valley Project and its history, see Dunning, *supra* note 16, at 946-50. The State Water Project is described in detail in HUNDLEY, *supra* note 6, at 272-97.

77. See CALIFORNIA WATER PLAN UPDATE, *supra* note 36, at 289. Elizabeth Rieke reports that forty percent of the state's drinking water passes through the Delta. Rieke, *supra* note 73, at 344.

78. California ranks as the top agricultural state, producing more than half of the nation's fruits, nuts, and vegetables. See CALIFORNIA DEP'T OF FOOD & AGRIC., CALIFORNIA AGRICULTURAL RESOURCE DIRECTORY 1999 28 (1999). The

The redirection of enormous volumes of water out of the Delta has brought the native fish to a crisis state. Dams constructed without concern for fish passage prevented salmon from accessing spawning habitat. The San Joaquin River was deliberately dewatered by construction of the Friant Dam.⁷⁹ The export of fresh water through the pumps exacerbates salt-water intrusion into the Delta, interferes with travel of adult fish upstream and larvae downstream, and sometimes even reverses the flow of the rivers.⁸⁰ These changes have led to the listing of four Delta fish species as threatened and one as endangered.⁸¹

The ecological stress on the Delta coincides with fears of water shortages for human uses. The state Department of Water Resources has projected annual shortfalls of 2.2 to 4.2 million acre-feet by 2020, even in years of normal rainfall.⁸² A warning shot across the state's bow occurred in June 1999, when pumping had to be reduced because Delta smelt had lingered in the vicinity of the pumps later in the season than expected. A minor water crisis ensued, not only for irrigators but also for Silicon Valley industrial plants and residents of Santa

total value of California's agricultural production in 1998 was \$25.9 billion. See *id.*

79. See Dunning, *supra* note 16, at 950–51.

80. Pumps for the Central Valley Project and the State Water Project are located in close proximity to one another not far from the town of Tracy. The Central Valley Project can pump up to 4600 cfs out of the Delta. The State Water Project adds an additional 10,300 cfs capacity. See CALIFORNIA DEP'T OF WATER RESOURCES & U.S. BUREAU OF RECLAMATION, BIOLOGICAL ASSESSMENT—EFFECTS OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT ON DELTA SMELT AND SACRAMENTO SPLITTAIL 4, 7 (1994) [hereinafter DELTA BIOP]. For a discussion of the impacts of the pumps on fish, see *id.* at 28–30; see also Harrison C. Dunning, *Revolution (and Counter-Revolution) in Western Water Law: Reclaiming the Public Character of Water Resources*, 8 FORDHAM ENVTL. L.J. 439, 450 (1997).

81. The Central Valley spring-run chinook, Sacramento splittail and Delta smelt are threatened; the Sacramento River winter-run chinook is endangered. See 50 C.F.R. § 17.11 (1999). The status of the Sacramento splittail is in some doubt. A federal judge recently ruled that its listing was arbitrary and capricious, but has given FWS until March 2001 to reconsider the listing decision. See *Federal Court Grants Fish and Wildlife Service Leave to Reexamine the Science of Listing the Sacramento Splittail*, CAL. LAND USE L. & POLY REPORTER, Nov. 2000, at 73; Notice of Reopening of Comment Period on the Threatened Status of the Sacramento Splittail (*Pogonichthys macrolepidotus*), 66 Fed. Reg. 2,828 (Jan. 12, 2001).

82. See CALIFORNIA WATER PLAN UPDATE, *supra* note 36, at 12. Shortages in drought years could reach 5.8 to 7.8 maf. See *id.*

Clara County. Even with the slowdown, environmental groups claimed that one hundred thousand smelt were killed.⁸³

5. The Pacific Northwest

The plight of salmon in the Pacific Northwest is well known. More than one hundred salmonid populations have been driven to extinction.⁸⁴ By 1999, twenty-three salmon runs, ranging from southern California to the border with Canada, had been listed under the ESA.⁸⁵ The Columbia River system, once teeming with salmon,⁸⁶ now boasts only meager remnants of its past glory. Various runs of sockeye, chinook, and coho salmon, steelhead, chum, and bull trout in the Columbia and its tributaries have reached the federal protected list.⁸⁷

Dams are the primary culprit in this decline. Large and small dams have blocked access to vast areas that once provided spawning habitat.⁸⁸ As John Volkman has explained, dams also make life difficult for salmon in a wide variety of less obvious ways:

[D]ams slow the migration, heat up the river, subject fish to pressure changes and descaling and affect food production in the river. Dams have converted the river to something resembling a series of lakes, which are more hospitable to

83. See Eric Brazil, *CalFed Water Plan Shelves Peripheral Canal*, S.F. EXAMINER, June 25, 1999, at A7. The total size of the Delta smelt population is not known. A 1990 study produced an estimate of 280,000, but that estimate is recognized as imperfect. U.S. FISH & WILDLIFE SVC., U.S. DEPT. OF INTERIOR, RECOVERY PLAN FOR THE SACRAMENTO-SAN JOAQUIN DELTA NATIVE FISHES 32 (1996) available at http://ecos.fws.gov/recovery_plan/pdf_files/1996/961126.pdf. Because of the smelt's short life span and the low fecundity, "a fairly substantial population probably is necessary to keep the species from becoming extinct." *Id.*

84. See Michael V. McGinnis, *On the Verge of Collapse: The Columbia River System, Wild Salmon and the Northwest Power Planning Council*, 35 NAT. RESOURCES J. 63, 68 (1995).

85. See Michael C. Blumm & Greg D. Corbin, *Salmon and the Endangered Species Act: Lessons from the Columbia Basin*, 74 WASH. L. REV. 519, 522 (1999).

86. Lewis and Clark found the abundance of salmon almost inconceivable when they reached the Columbia in 1805. See DANIEL B. BOTKIN, *OUR NATURAL HISTORY: THE LESSONS OF LEWIS AND CLARK* 182-83 (1995).

87. See Blumm & Corbin, *supra* note 85, at 528-48.

88. Dams constructed since 1930 have rendered inaccessible roughly thirty to forty percent of salmon habitat in the Columbia basin. See Volkman, *supra* note 20, at 53. See also UPSTREAM, *supra* note 32, at 231 (reporting that dams without fish-passage facilities block about half the area of the Columbia River watershed that was historically accessible to anadromous fish).

salmon predators like squawfish than they are to salmon. The dams have inundated what was once productive streamside habitat. They have simplified the river's complexity by eliminating braided channels and hydrologic processes that once were part of important food and energy chains.⁸⁹

The salmon problem, however, is not solely attributable to the Columbia dams. Fishing, forest practices, hatcheries, and ocean conditions have all affected the salmon.⁹⁰

The urban Northwest is implicated in the plight of the salmon in several ways. First, urban residents enjoy the inexpensive electricity generated by the Columbia River dams.⁹¹ Second, although the region's water resources are plentiful by comparison with those of some other parts of the West, water withdrawals from the Columbia and its tributaries contribute to salmon declines.⁹² Lowering water levels in rivers and streams slows flows and raises temperatures, increasing the hazards of migration to the sea and back to the spawning grounds.⁹³ The streams of the Pacific Northwest, like those in other parts of the West, are generally fully- or over-appropriated, primarily for irrigation.⁹⁴ Urban growth, expected to be rapid at least for the next decade,⁹⁵ will exacerbate the problems faced by salmon if it increases demands for consumptive water use. Alternatively, aggressive protection of the water resources needed by salmonids will make it more diffi-

89. Volkman, *supra* note 20, at 52; see also UPSTREAM, *supra* note 32, at 231-37 (detailing the effects of large dams on salmon); INDEPENDENT SCIENTIFIC GROUP, *supra* note 30, at 51-63, 264-324.

90. See UPSTREAM, *supra* note 32, at 3-6 & 8-14; Volkman, *supra* note 20, at 52-53; INDEPENDENT SCIENTIFIC GROUP, *supra* note 30, at 49, 140-46.

91. Published estimates vary. Volkman, *supra* note 20, at 52, puts the proportion at one-third. Others claim the dams produce as much as forty-five percent, see Sam R. Sperry, *Region at Risk; Oregon Governor Calls for New Effort to Save the Northwest's Fish, Low Cost Power*, SEATTLE POST-INTELLIGENCER, Sept. 12, 1999, at E1, or even seventy-five percent, see Henry B. Lacey, *New Hope for Pacific Salmon?*, 3 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 19, 25 (1995), of the region's electricity.

92. See Joy Ellis, *Drafting from an Overdrawn Account: Continuing Water Diversions from the Mainstem Columbia and Snake Rivers*, 26 ENVTL. L. 299, 299-303 (1996).

93. See *id.* at 303.

94. See JOHN VOLKMAN, *A RIVER IN COMMON: THE COLUMBIA RIVER, THE SALMON ECOSYSTEM, AND WATER POLICY* 55 (1997). See generally Ellis, *supra* note 92.

95. See VOLKMAN, *supra* note 94, at 17.

cult for growing cities to find sources of water.⁹⁶ Third, urbanization, with its accompanying increases in impervious surfaces and pollution, directly affects imperiled fish. The rule listing the Puget Sound chinook, for example, notes that juvenile chinook from urban estuaries are more susceptible to disease than those from non-urban estuaries.⁹⁷

The 1999 listings of chinook salmon and bull trout in the Puget Sound⁹⁸ made it abundantly clear that endangered aquatic species are not limited to rural areas or the dry interior but occupy even the largest cities in the wettest portion of the region. These urban listings bring challenges for any development that affects the quantity or quality of water resources, a large category indeed.

II. THE ENDANGERED SPECIES ACT AND MUNICIPAL WATER

Conflicts between endangered species and water projects are far from novel. In the very first major litigation under the ESA, the lowly snail darter halted completion of the Tellico Dam, a project on which federal taxpayers had already spent more than one hundred million dollars.⁹⁹ Until recently, such conflicts in the West were far more likely to involve irrigation than municipal users. With both the list of federally protected aquatic species and the West's human population expanding rapidly, however, the ESA now affects many municipal water suppliers.

96. Recently, the National Marine Fisheries Service determined that a proposed new irrigation withdrawal from the Columbia would pose an impermissible threat to listed salmon. See Blumm & Corbin, *supra* note 85, at 582-84.

97. See Threatened Status for Three Chinook Salmon ESUs, 64 Fed. Reg. 14,308, 14,319 (Mar. 24, 1999).

98. See Determination of Threatened Status for Bull Trout in the Coterminous United States, 64 Fed. Reg. 58,910 (Nov. 1, 1999) (to be codified at 50 C.F.R. pt. 17); Listing of Nine Evolutionarily Significant Units of Chinook Salmon, Chum Salmon, Sockeye Salmon, and Steelhead, 64 Fed. Reg. 41,835 (Aug. 2, 1999) (to be codified at 50 C.F.R. pt. 17).

99. See *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 172-73 (1978). Eventually, of course, the Tellico Dam was completed, on the specific direction of Congress. See *infra* note 238.

A. *Overview of the Endangered Species Act*

The ESA is jointly administered by the U.S. Fish and Wildlife Service (FWS) for the Department of Interior and the National Marine Fisheries Service (NMFS) for the Department of Commerce (together “the Services”).¹⁰⁰ The Services maintain a list of species determined by regulation to be threatened or endangered.¹⁰¹ “Endangered” species are in danger of extinction throughout all or a substantial portion of their range.¹⁰² “Threatened” species are not yet endangered, but are likely to reach that point in the foreseeable future.¹⁰³ The determination that a species is endangered or threatened must be made solely on the basis of the best available scientific evidence.¹⁰⁴

The ESA directs the Services to designate critical habitat for each species, to the maximum extent prudent and determinable, coincident with listing.¹⁰⁵ Critical habitat includes areas essential to the conservation of the species that may require special management considerations or protection.¹⁰⁶ Despite the ESA’s mandate, critical habitat has not yet been designated for the majority of listed species.¹⁰⁷ The Services resist designating critical habitat in part because a time-consuming analysis of economic impacts is a prerequisite to designation.¹⁰⁸

100. FWS has lead responsibility for the vast majority of listed species, but NMFS is responsible for marine species, including anadromous fish. *See* Reorganization Plan No. 4 of 1970, 35 Fed. Reg. 15,627 (July 9, 1970).

101. *See* 16 U.S.C. § 1533(a) (1994). The statute defines the term “species” to include subspecies and distinct population segments of vertebrate animals. *See id.* § 1532(16).

102. *See id.* § 1532(6).

103. *See id.* § 1532(20).

104. *See id.* § 1533(b)(1)(A).

105. *See id.* § 1533(a)(3).

106. *See id.* § 1532(5)(A).

107. *See* Notice of Intent to Clarify the Role of Habitat in Endangered Species Conservation, 64 Fed. Reg. 31,871, 31,872 (June 14, 1999).

108. *See* 16 U.S.C. § 1533(b)(2) (1994). The economic analysis required for critical habitat designation can cost as much as \$500,000, money the Services believe they cannot spare from already tight listing budgets. *See* Notice of Intent to Clarify the Role of Habitat in Endangered Species Conservation, 64 Fed. Reg. 31,871, 31,873 (June, 14, 1999). This objection is difficult to reconcile with the claim that critical habitat designation adds no new protection for the species. If so, it necessarily adds no economic impacts, and the economic analysis could presumably be expressed in a single sentence. *Cf.* *New Mexico Cattle Growers Ass’n v. United States Fish & Wildlife Serv.*, 81 F. Supp. 2d 1141 (D.N.M. 1999) (upholding Finding of No Significant Impact under the National Environmental Pol-

Listed species receive the protection of the ESA's two primary regulatory provisions, sections 7 and 9. Section 7 requires federal agencies to carry out programs for the conservation of listed species and to insure that their actions are not likely to jeopardize the continued existence of any listed species or adversely modify its designated critical habitat.¹⁰⁹ Section 9 forbids the "take," broadly defined, of endangered and, in many cases, threatened animals.¹¹⁰ Municipal water use can implicate both sections.

B. Section 7: Federal Duties

Section 7 applies to municipal water supplies with a federal nexus, just as it applies to federal irrigation projects. It imposes two duties, an affirmative one to conserve listed species, and a negative one not to jeopardize their continued existence.

1. The Duty to Conserve

Section 7(a)(1) requires all federal agencies to use their authorities "in furtherance of the purposes of [the ESA] by carrying out programs for the conservation" of listed species.¹¹¹ Conservation means "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary."¹¹²

The exact scope of the duty to conserve remains somewhat murky; relatively few judicial decisions have addressed it, and the Services have not implemented it by regulation.¹¹³ It seems

icy Act for designation of critical habitat on grounds that designation does not alter regulatory regime).

109. See 16 U.S.C. § 1536.

110. See *id.* § 1538. The scope of the prohibition is explained below. See *infra* text accompanying notes 160–172.

111. 16 U.S.C. § 1536(a)(1).

112. *Id.* § 1532(3).

113. FWS believes that it lacks authority to "mandate how or when other Federal agencies are to implement their responsibilities" under section 7(a)(1). Interagency Cooperation—Endangered Species Act of 1973, as Amended; Final Rule, 51 Fed. Reg. 19,926, 19,934 (June 3, 1986) (to be codified at 50 C.F.R. pt. 402). The only reference to section 7(a)(1) in the Services' joint regulations implementing the ESA is a statement that conservation programs implemented under section 7(a)(1) must comply with permit requirements where applicable, and

clear that section 7(a)(1) imposes an affirmative duty to consider and plan for the conservation of species that may be affected by agency actions.¹¹⁴ This duty is enforceable by members of the public through the ESA's citizen suit provision and the Administrative Procedure Act.¹¹⁵ Whether it adds anything of substance to the consultation requirement of section 7(a)(2),¹¹⁶ however, is unclear. The strongest reading of section 7(a)(1) would require that every federal agency do everything possible to recover every listed species to the point of delisting.¹¹⁷ Unlike the duty not to jeopardize, which requires only that agencies halt their activities short of causing extinction, a rigorous duty to support recovery would have no clear limit. Agencies could almost always do something more to help a listed species. The strong reading of section 7(a)(1), therefore, could force agencies to divert the bulk of their funding from their primary missions to advance the recovery of endangered species. Absent unmistakably clear direction from Congress, it is not surprising that neither the FWS nor the courts have adopted this interpretation. FWS, the agency charged with implementing the ESA, has stated that section 7(a)(1) does not mandate that agencies take any particular action.¹¹⁸ The courts have deferred to that interpretation, uniformly agreeing that section 7(a)(1) leaves agencies considerable discretion to determine what specific measures their conservation programs will include.¹¹⁹

should be coordinated with the appropriate Service. See 50 C.F.R. § 402.01(a) (1999). Professor Ruhl's examination of section 7(a)(1) remains the most comprehensive source. See J.B. Ruhl, *Section 7(a)(1) of the "New" Endangered Species Act: Rediscovering and Redefining the Untapped Power of Federal Agencies' Duty to Conserve Species*, 25 ENVTL. L. 1107 (1995).

114. See *Sierra Club v. Glickman*, 156 F.3d 606, 617 (5th Cir. 1998); *Florida Key Deer v. Stickney*, 864 F. Supp. 1222, 1238 (S.D. Fla. 1994).

115. See *Sierra Club*, 156 F.3d at 616-17.

116. See *infra* notes 123-130 and accompanying text.

117. See *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 157 (1978).

118. See *Interagency Cooperation—Endangered Species Act of 1973, as Amended*; Final Rule, 51 Fed. Reg. 19,926, 19,934 (June, 3, 1986) (to be codified at 50 C.F.R. pt. 402).

119. See *Pyramid Lake Paiute Tribe v. United States Dep't of the Navy*, 898 F.2d 1410 (9th Cir. 1990); *Coalition for Sustainable Resources, Inc. v. United States Forest Serv.*, 48 F. Supp. 2d 1303, 1315-16 (D. Wyo. 1999); *Hawksbill Sea Turtle v. Federal Emergency Mgmt. Agency*, 11 F. Supp. 2d 529, 542-43 (D. V.I. 1998); *Strahan v. Linnon*, 967 F. Supp. 581, 596 (D. Mass. 1997); *Center for Marine Conservation v. Brown*, 917 F. Supp. 1128, 1149-50 (S.D. Tex. 1996); *National Wildlife Fed'n v. National Park Serv.*, 669 F. Supp. 384, 387 (D. Wyo. 1987).

Although section 7(a)(1) has so far proved an imperfect sword for environmentalists bent on forcing agencies to aid listed species, it is a powerful shield for agencies inclined to favor listed species over competing interests. Even in this context, the reach of section 7(a)(1) is limited by the agencies' existing statutory authority. In *Platte River Whooping Crane Critical Habitat Maintenance Trust v. FERC*,¹²⁰ the D.C. Circuit held that section 7(a)(1) did not override limitations imposed by the Federal Power Act on the Federal Energy Regulatory Commission (FERC). The court ruled that section 7(a)(1) did not supersede the Federal Power Act's requirement that FERC annually renew operating licenses on existing terms pending long-term relicensing. Accordingly, even if minimum flow requirements would benefit the endangered whooping crane, FERC had no power to impose them on the interim license. *Platte River* teaches that section 7(a)(1) is not itself a source of authority for agency action. It operates only within the boundaries of the agency's statutory authority.

Within those bounds, however, section 7(a)(1) permits agencies to do all they choose to protect listed species. In *Carson-Truckee Water Conservancy District v. Clark*,¹²¹ for example, the Ninth Circuit held that the Department of Interior could reserve all of the Washoe Project's water for the conservation of listed fish, even if that water was not necessary to avoid jeopardy.¹²² Where a federal agency is so inclined, therefore, it can use section 7(a)(1) to justify reserving for listed species any water it is not statutorily obligated to deliver. It cannot be forced to do so, however, by section 7(a)(1). Only section 7(a)(2) provides that kind of power.

2. The Duty to Insure Against Jeopardy

Section 7(a)(2) requires that federal agencies, in consultation with the Services, insure that actions they authorize, fund, or carry out are not "likely to jeopardize the continued existence" of listed species or destroy or adversely modify designated critical habitat.¹²³ In order to fulfill this duty, a federal

120. 962 F.2d 27 (D.C. Cir. 1992).

121. 741 F.2d 257 (9th Cir. 1984).

122. *See id.* at 262-63.

123. 16 U.S.C. § 1536(a)(2) (1994).

agency contemplating an action that may affect a listed species or its critical habitat must formally consult with the appropriate Service.¹²⁴ Consultation culminates in issuance by the Service of a written biological opinion as to whether the action is "likely to jeopardize the continued existence" of a species or adversely modify a designated critical habitat.¹²⁵

An action fails the jeopardy test if, on the basis of the best available scientific information, it "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."¹²⁶ Destruction or adverse modification of critical habitat means "direct or indirect alteration that appreciably diminishes the value" of the habitat for survival and recovery.¹²⁷

FWS believes the "adverse modification" prong of section 7(a)(2) adds little to the "jeopardy" prong because adverse modification of critical habitat will nearly always produce jeopardy.¹²⁸ Not everyone agrees that critical habitat designation is redundant, however, and critical habitat decisions remain a flashpoint for controversy. Environmental groups view critical habitat as an important additional protection for listed species, while resource users regard it as another potential limitation on their actions. When FWS failed to designate critical habitat for the Rio Grande silvery minnow, for example, environmental groups sought and obtained a judicial determination that it had a duty to do so.¹²⁹ When FWS finally did designate critical habitat the designation was quickly challenged, by the state and irrigators on one side and by environmental groups on the other.¹³⁰

124. *See id.*; 50 C.F.R. § 402.14(a) (1999).

125. 16 U.S.C. § 1536(b)(3)(A) (1994). *See also* 50 C.F.R. § 402.14(g)(4) (1999).

126. 50 C.F.R. § 402.02 (1999).

127. *Id.*

128. *See* Notice of Intent to Clarify the Role of Habitat in Endangered Species Conservation, 64 Fed. Reg. 31,871, 31,872 (June 14, 1999) (stating that "[f]or almost all species, the adverse modification and jeopardy standards are the same . . .").

129. *See* Forest Guardians v. Babbitt, 174 F.3d 1178, 1193 (10th Cir. 1999).

130. *See* Plaintiff's Original Complaint, New Mexico *ex rel.* Office of the State Engineer v. Babbitt, (No. 99-00872) (D.N.M. Aug. 4, 1999); Plaintiff's Original Complaint, Forest Guardians v. Babbitt, (No. 99-01445) (D.N.M. Dec. 15, 1999).

In determining whether jeopardy or adverse modification of critical habitat is likely to result from an agency action, FWS must consider the direct and indirect effects of the proposed action together with the effects of other interrelated and interdependent actions.¹³¹ Indirect effects "are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur."¹³² In evaluating an application to construct a dam in federal waters, for example, the Corps of Engineers must consider not only the on-site effects of the dam on water quality, but also reductions in flow attributable to consumption facilitated by the project.¹³³ If the action is likely to induce population growth, the effects of that growth on listed species must also be considered.¹³⁴

Jeopardy opinions, concluding that an action is likely to cause jeopardy or adverse modification of critical habitat, must be accompanied by "reasonable and prudent" alternatives, if any, that the Services believe would avoid jeopardy or adverse modification.¹³⁵ Jeopardy opinions are not directly binding. The federal agency considering an action is responsible for ensuring compliance with section 7¹³⁶ and may choose to reject the Services' views. As the formal view of an agency with expertise in species protection, however, a biological opinion carries considerable weight with a reviewing court.¹³⁷ Not surprisingly, biological opinions are virtually determinative of the outcome, and their production is a difficult and controversial process.¹³⁸

131. See 50 C.F.R. § 402.02 (1999) (defining "effects of the action" that must be considered).

132. *Id.*

133. See *Riverside Irrigation Dist. v. Andrews*, 758 F.2d 508, 513-14 (10th Cir. 1985).

134. See *National Wildlife Fed'n v. Coleman*, 529 F.2d 359, 373-74 (5th Cir. 1976); *Florida Key Deer v. Stickney*, 864 F. Supp. 1222 at 1240-41. (S.D. Fla. 1994).

135. See 50 C.F.R. § 402.14(h)(3) (1999); see also 16 U.S.C. § 1536(b)(3)(A) (1994).

136. See 50 C.F.R. § 402.15(a) (1999); *Sierra Club v. Froehlike*, 534 F.2d 1289, 1303-04 (8th Cir. 1976); see also *Coleman*, 529 F.2d at 371.

137. See *Bennett v. Spear*, 520 U.S. 154, 169 (1997); see also *Pyramid Lake Paiute Tribe v. United States Dep't of the Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990).

138. For a recent analysis of both the broad scope and the limitations of the section 7 process in the context of Pacific salmon protection, see generally Blumm & Corbin, *supra* note 85.

Federal actions are subject to section 7 so long as "discretionary Federal involvement or control" remains.¹³⁹ Even after the issuance of a biological opinion, consultation must be reinitiated if: the amount of taking specified in the biological opinion is exceeded; new information reveals that the project may have effects on listed species that were not previously considered; the action itself is modified in a way that changes the effect on listed species; or additional species that may be affected by the action are added to the endangered and threatened list.¹⁴⁰

The Supreme Court has endorsed a strict reading of section 7, applying it to even seemingly minimal agency actions. In *Tennessee Valley Authority v. Hill*, the Court held that closing the gates on a nearly complete federal dam was a federal action subject to the strictures of section 7.¹⁴¹ Following that lead, the lower federal courts have tended to construe "agency action" broadly. Section 7 becomes irrelevant only if the federal agency has no discretion to make or require changes that might alter the action's effects on listed species.¹⁴²

The renewal of a contract for delivery of water from a federal project is an "action" subject to section 7.¹⁴³ So is water delivery under an existing contract, if the project's statutory authorization leaves the agency any discretion. It does not matter if the contract predates the ESA. In general, contracts, including those to which the government is a party, remain subject to subsequently enacted legislation.¹⁴⁴ Therefore, the ESA governs water contracts, whenever entered into, provided that the government retains "some measure of control over the activity."¹⁴⁵ Absent statutory delivery guarantees, therefore, the needs of dwindling aquatic species will prevail over water delivery to municipal, as well as agricultural, purchasers.

Moreover, federal water agencies are unlikely to owe damages for ESA-induced reductions in water deliveries. The gov-

139. 50 C.F.R. § 402.03 (1999).

140. *See id.* § 402.16.

141. *See Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 193-94 (1978).

142. *See Sierra Club v. Babbitt*, 65 F.3d 1502, 1512 (9th Cir. 1995).

143. *See Natural Resources Defense Council v. Houston*, 146 F.3d 1118, 1125 (9th Cir. 1998).

144. *See Bowen v. Public Agencies Opposed to Social Security Entrapment*, 477 U.S. 41, 52 (1986).

145. *Klamath Water Users Prot. Ass'n v. Patterson*, 204 F.3d 1206, 1213 (9th Cir. 1999).

ernment can assert the defense of impossibility when a regulatory or legislative change prevents it from meeting its contractual obligations, so long as the change "is relatively free of Government self-interest."¹⁴⁶ Because no one would contend that the ESA was adopted, or any species was listed, in order to free the government from its obligations under water contracts, the impossibility defense would be available. While that defense can be surrendered by a specific contract provision assigning the risk to the government, standard federal water contracts contain a broad disclaimer of liability for water shortages.¹⁴⁷ Nor is there any reason to anticipate that the United States would agree to accept liability for ESA-caused water shortfalls in the future. Customers who need water from U.S. projects have little leverage to compel such a change.¹⁴⁸

Section 7(a)(2) also applies to municipal wastewater discharges, as well as to industrial discharges that may accompany or fuel population growth. Like other point sources, wastewater treatment plants which discharge effluent to the waters of the United States must have National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act.¹⁴⁹ Issuance of an NPDES permit by the U.S. Environmental Protection Agency (EPA) is a federal action subject to section 7 consultation, although EPA has not always voluntarily engaged in such consultation.

146. *United States v. Winstar Corp.*, 518 U.S. 839, 896 (1996); *see also id.* at 898 (stating that "governmental action will not be held against the Government for purposes of the impossibility defense so long as the action's impact upon public contracts is . . . merely incidental to the accomplishment of a broader government objective").

147. *See O'Neill v. United States*, 50 F.3d 677, 683-84 (9th Cir. 1995) (holding that standard contract clause absolving U.S. of liability for water shortages "on account of errors in operation, drought, or *any other causes*" precludes damages award for delivery reductions needed to protect Delta smelt).

148. The very different bargaining positions distinguish water contracts from incidental take permits. In that context, the United States generally does accept the obligation to shoulder unexpected additional financial burdens of conservation. *See infra* note 201 and accompanying text. That choice has been driven by federal anxiety to demonstrate that the incidental take provision works. The water agencies have no similar need to demonstrate the usefulness of their projects. Even in the HCP context, it is unclear whether the U.S. can be forced to honor the "No Surprises" clause. *See Jean O. Melious & Robert D. Thornton, Contractual Ecosystem Management Under the Endangered Species Act: Can Federal Agencies Make Enforceable Commitments?*, 26 *ECOLOGY L.Q.* 489 (1999).

149. *See* 33 U.S.C. § 1311(a) (1994). NPDES permits run for a maximum term of five years. *See id.* § 1342(b)(1)(B).

Permits for wastewater treatment plants are among those that may come up against endangered species conflicts. In areas like the middle Rio Grande, for example, where the outfall from sewage treatment plants constitutes a high proportion of river flows in dry seasons,¹⁵⁰ the discharges from those plants are likely to affect listed species.¹⁵¹ Even in wetter areas, municipal wastewater discharges can pose problems for endangered species. The effluent from San Jose's sewage treatment plant, for example, flows into the salt marsh at the edge of San Francisco Bay. The fresh water it adds changes the vegetation, making the habitat unsuitable for salt marsh species including the endangered salt marsh harvest mouse and California clapper rail.¹⁵²

Other permits associated with urbanization may encounter section 7 complications if their growth-inducing as well as direct effects on species must be considered. FWS recently demanded, for example, that EPA consult on a general permit for storm water discharge from construction activities in Arizona. The basis for that claim was the expected groundwater extraction to serve the development after construction, which FWS characterized as an indirect effect of the permit.¹⁵³ That reasoning could require consultation on any NPDES permits associated with urban growth. It could even be expanded to cover

150. Forest Guardians claims that sewage discharges constitute more than half the flow of the Rio Grande under low flow conditions. See Forest Guardians, *Settlement Agreement Signed to Resolve Forest Guardians' 1998 Lawsuit*, at <http://www.fguardians.org/news/pr991122.html> (Nov. 22, 1999).

151. FWS has identified municipal or domestic sewage as a threat to a number of aquatic species, including two Alabama snails, see *Endangered Status for Three Aquatic Snails and Threatened Status for Three Aquatic Snails in the Mobile River Basin of Alabama*, 63 Fed. Reg. 57,610, 57,616 (Oct. 28, 1998), the Arkansas river shiner, see *Final Rule to List the Arkansas River Basin Population of the Arkansas River Shiner (*Notropis girardi*) as Threatened*, 63 Fed. Reg. 64,772, 64,793 (Nov. 23, 1998), the bull trout, see *Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout*, 63 Fed. Reg. 31,647, 31,663 (June 10, 1998), and the Pecos bluntnose shiner, see *Notropis simus pecosensis* (Pecos Bluntnose Shiner), 52 Fed. Reg. 5295, 5300 (Feb. 20, 1987).

152. See Jim Rendon, *Liquid Assets*, METRO, available at <http://www.metroactive.com/papers/metro/09.11.97/cover/water2-9737.html> (Sept. 11-17, 1997).

153. See Norman D. James & Fennemore Craig, *Fish & Wildlife Service Advises EPA Region 9 That Groundwater Pumping and Related Impacts Caused by Urban Growth Are Effects of Storm Water Discharge Permits*, ABA ENDANGERED SPECIES COMMITTEE NEWSLETTER, Nov. 2000, at 9.

industrial permits, since new or expanded industrial activity tends to bring residential growth.

Although EPA remains responsible for issuing NPDES permits in a handful of states, in the vast majority it has delegated that authority to state officials.¹⁵⁴ EPA and FWS now agree that both approval by EPA of state water quality standards and delegation of NPDES authority to the states require consultation.¹⁵⁵ A draft Memorandum of Agreement between the agencies states that EPA will amend its Clean Water Act regulations to explicitly require that state water quality standards not jeopardize federally listed species.¹⁵⁶ EPA will also consult with FWS regarding the water quality criteria it issues to guide state water quality standard determinations. Separate consultation will not be required on state standards identical to, or more stringent than, EPA's criteria.¹⁵⁷

Some uncertainty remains as to how or whether section 7(a)(2) applies to permits issued by state agencies under delegated authority. The Fifth Circuit has held that EPA is powerless to compel state permitting agencies to consult with FWS before issuing NPDES permits.¹⁵⁸ EPA disagrees with that decision, but believes it permits the approach taken in the draft Memorandum of Agreement. EPA has committed to veto any permit it determines is likely to jeopardize or adversely modify the critical habitat of a listed species.¹⁵⁹

154. See 33 U.S.C. § 1342(b) (1994). As of September 16, 1998, EPA had approved NPDES programs in forty-four states. See Environmental Prot. Agency, *State NPDES Program Status*, at <http://www.epa.gov/owm/stat.pdf> (updated Sept. 16, 1998). Since then, Maine has applied for approval of its program. See *State Program Requirements; Application to Administer the National Pollutant Discharge Elimination System (NPDES) Program; Maine*, 64 Fed. Reg. 73,552, 73,552 (Dec. 30, 1999).

155. See Draft Memorandum of Agreement Between the Environmental Protection Agency, Fish and Wildlife Service, and National Marine Fisheries Service Regarding Enhanced Coordination Under the Clean Water Act and the Endangered Species Act, 64 Fed. Reg. 2,742, 2,746 (Jan. 15, 1999).

156. See *id.* at 2,744.

157. See *id.* at 2,745.

158. See *American Forest and Paper Ass'n v. EPA*, 137 F.3d 291 (5th Cir. 1998).

159. EPA will consult with FWS, which receives copies of all draft permits, in making this determination. See Draft Memorandum of Agreement Between the Environmental Protection Agency, Fish and Wildlife Service, and National Marine Fisheries Service Regarding Enhanced Coordination Under the Clean Water Act and the Endangered Species Act, 64 Fed. Reg. 2,742, 2755-56 (Jan. 15, 1999).

C. *Section 9: The Prohibition on Take*

1. The Scope of Section 9 Liability

Section 9, applicable to all actions regardless of whether they have a federal nexus, imposes a series of prohibitions. Of most relevance to municipal water issues is the prohibition on "take" of endangered animals.¹⁶⁰ The statute defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."¹⁶¹ The Services' regulations further emphasize the breadth of the take prohibition. "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns including, but not limited to, breeding, feeding, or sheltering.¹⁶² "Harm" includes significant habitat modification or degradation that actually kills or injures listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.¹⁶³

The Supreme Court upheld the regulatory definition of "harm" against a facial challenge in *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*.¹⁶⁴ In a concurring opinion, Justice O'Connor stressed her understanding that "the regulation's application is limited by ordinary principles of proximate causation, which introduce notions of foreseeability."¹⁶⁵ The majority agreed in two footnotes.¹⁶⁶ *Sweet Home's* discussion of proximate cause and foreseeability have not, however, had much impact on subsequent cases. The Eleventh Circuit has suggested that this aspect of *Sweet Home* is merely

160. Plants receive considerably less protection than animals under section 9. The take prohibition does not extend to plants, but section 9 does make it unlawful to: remove or maliciously damage or destroy endangered plants from areas under federal jurisdiction; maliciously damage or destroy them on federal lands; or remove, cut, dig up, damage, or destroy them on other lands in knowing violation of state law, or in the course of any violation of state trespass law. See 16 U.S.C. § 1538(a)(2) (1994). These strictures are unlikely to conflict with municipal water uses, unless state law requires that water required by a listed plant be left in the ground or in a stream.

161. *Id.* § 1532(19) (1994).

162. See 50 C.F.R. § 17.3 (1999).

163. See *id.*

164. 515 U.S. 687 (1995).

165. *Id.* at 709.

166. See *id.* at 697 n.9, 700 n.13.

dicta.¹⁶⁷ No reported opinion has so far rejected a claim under section 9 for lack of proximate cause or foreseeability.

The *Sweet Home* opinion's emphasis on the fact that habitat modification does not constitute take unless it actually kills or injures a member of the listed species has had more impact. Although expert testimony concerning the effects of an action on a listed species can still be sufficient to prove harm without the production of an individual injured animal, courts may be looking a bit more skeptically at such expert opinions.¹⁶⁸

Knowing violations of the prohibition on take are punishable by civil penalties of up to twenty-five thousand dollars per violation and criminal penalties of up to fifty thousand dollars per violation and imprisonment for up to one year.¹⁶⁹ In addition, citizen suits are available to enjoin any violation.¹⁷⁰ An injunction may be granted before any harm has occurred if the plaintiff can show a reasonably certain threat of imminent harm.¹⁷¹ Successful citizen suit plaintiffs can recover attorney fees.¹⁷²

2. Section 9 and Municipal Water

Municipal water use may cause the take of listed species in a number of different ways. Construction of facilities needed to obtain or distribute water can take either aquatic or terrestrial species, directly or through habitat modification.¹⁷³ In some

167. See *Loggerhead Turtle v. County Council of Volusia County*, 148 F.3d 1231, 1251 n.23 (11th Cir. 1998).

168. See, e.g., *Defenders of Wildlife v. Bernal*, 204 F.3d 920 (9th Cir. 2000) (holding that plaintiffs had not proven that proposed construction of school would harm or harass pygmy owls); *Arizona Cattle Growers Ass'n v. United States Fish and Wildlife Serv.*, 63 F. Supp. 2d 1034 (D. Ariz. 1998) (holding that FWS acted arbitrarily and capriciously in issuing incidental take statement including measures to restrict grazing near streams because there was no evidence that listed species were even present on allotments in question, much less that they would be killed or injured by grazing).

169. See *Marbled Murrelet v. Babbitt*, 83 F.3d 1060, 1064-65 (9th Cir. 1996).

170. See 16 U.S.C. § 1540(a), (b) (1994).

171. See *id.* § 1540(g).

172. See *id.*

173. See, e.g., Final Rule to List the San Bernardino Kangaroo Rat as Endangered, 63 Fed. Reg. 51,005, 51,010-11 (Sept. 24, 1998) (identifying proposals to construct a municipal water pipeline and groundwater recharge facilities in the species' habitat as potential threats).

cases, at least, that form of take may be relatively easy to avoid through changes in infrastructure design.

Take through excessive withdrawal is more difficult to avoid. Withdrawals of ground or surface water violate section 9 if they reduce streamflows below levels required for listed species. In 1993, for example, in response to a citizen suit, a federal district court held that lowering of spring flows from San Marcos and Comal Springs by excessive pumping from the Edwards Aquifer constituted a take of the fountain darter.¹⁷⁴ When spring flows again decreased in 1996, FWS declared that it would not take enforcement action against the pumpers, leading to another successful citizen suit.¹⁷⁵

FWS has identified municipal or domestic water demands as potential threats to many other listed species in the West, both aquatic and terrestrial.¹⁷⁶ Major pumpers or diverters of waters needed by those species risk liability for take if they reduce flows below safe levels. Where many entities withdraw similar quantities of water, it may be difficult to assign blame for any harm that results.¹⁷⁷ However, as major diverters, mu-

174. See *Sierra Club v. Lujan*, No. MO-91-CA-069, 1993 WL 151353, at *13 (W.D. Tex. Feb. 1, 1993).

175. See Votteler, *supra* note 40, at 869. The district court ordered state authorities to implement an emergency water withdrawal reduction plan, but the Fifth Circuit vacated the order, holding that the federal court should have abstained in favor of a state administrative process. See *id.* at 869-70.

176. See, e.g., Designation of Critical Habitat for the Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*), 64 Fed. Reg. 37,419, 37,425 (July 12, 1999); Notice of Determination to Retain Endangered Status for the Bruneau Hot Springsnail in Southwestern Idaho Under the Endangered Species Act, 63 Fed. Reg. 32,981, 32,988 (June 17, 1998); Endangered Status for the Peninsular Ranges Population Segment of the Desert Bighorn Sheep in Southern California, 63 Fed. Reg. 13,134, 13,146 (Mar. 18, 1998); Neosho Madtom Determined To Be Threatened, 55 Fed. Reg. 21,148, 21,150 (May 22, 1990); Final Rule Determining the June Sucker (*Chasmistes liorus*) To Be an Endangered Species With Critical Habitat, 51 Fed. Reg. 10,851, 10,854 (Mar. 31, 1986); Determination of Endangered Status and Critical Habitats for Two Fish Species in Ash Meadows, Nevada, 48 Fed. Reg. 40,178, 40,182 (Sept. 2, 1983). Many other listings identify surface water diversion or groundwater pumping as threats without specifically distinguishing between municipal, industrial, and agricultural uses. See, e.g., Proposed Rule to List the Southwestern Willow Flycatcher as Endangered With Critical Habitat, 58 Fed. Reg. 39,495, 39,499-500 & 39,504 (July, 23, 1993).

177. See *Pyramid Lake Paiute Tribe of Indians v. United States Dep't of the Navy*, 898 F.2d 1410, 1420 (9th Cir. 1990) (noting both that evidence did not establish take of listed fish due to water diversion and that plaintiff had not distinguished defendant from other users of the river's water, including plaintiff).

nicipal water agencies, like irrigation districts, may be easy targets for section 9 enforcement actions or citizen suits.

Even if minimum streamflows remain, facilities used to divert water may themselves take aquatic species. Pumps used to remove water from the stream can physically batter fish¹⁷⁸ or entrain them, preventing their migration to spawning or rearing grounds.¹⁷⁹ Dams or other structures that prevent access to spawning grounds can take listed fish.¹⁸⁰ Wastewater discharges that reduce water quality below levels required by a listed species would also violate section 9.¹⁸¹

Perhaps of greatest concern to local governments and water agencies are several cases holding that regulatory bodies can be liable under section 9 for permitting others to engage in actions that take listed species. The First Circuit has held that state fishing regulations permitting the use of certain types of lobster gear amounted to a take of endangered northern right whales that became entangled in the gear.¹⁸² In *Loggerhead Turtle v. County Council of Volusia County*,¹⁸³ the Eleventh Circuit agreed with the First, holding that a local government could be liable under section 9 if it did not sufficiently regulate beach lighting harmful to listed turtles.¹⁸⁴

On remand of the *Loggerhead Turtle* case, the district court placed some limits on this sort of "regulatory take" liabil-

178. See *United States v. Glenn-Colusa Irrigation Dist.*, 788 F. Supp. 1126 (E.D. Cal. 1992) (holding that irrigators whose pumping operations battered listed fish against fish screens had committed a take of the fish).

179. See DELTA BIOP, *supra* note 80, at 28.

180. Although Justice Scalia suggested in his dissent in *Sweet Home* that preventing reproduction does not "harm" wildlife, see *Babbitt v. Sweet Home Chapter of Cmities for a Great Or.*, 515 U.S. 687, 716 (1995) (Scalia, J. dissenting), Justice O'Connor specifically disagreed in her concurrence, see *id.* at 709-10 (O'Connor, J., concurring). Her view seems likely to prevail among the other members of the Court.

181. If there were multiple dischargers in the stream segment, it might be difficult to prove a take by any of them. In many cases, though, municipal wastewater plants are the largest dischargers in the area. Proving take by the Albuquerque or San Jose plants, for example, would appear relatively straightforward. See *supra* text accompanying notes 150-152.

182. See *Strahan v. Coxe*, 127 F.3d 155 (1st Cir. 1997). Following that case, a district court ruled that a town that did not sufficiently regulate off-road vehicle use on its beaches was responsible for take of threatened piping plovers by those vehicles. See *United States v. Town of Plymouth*, 6 F. Supp. 2d 81, 90-92 (D. Mass. 1998).

183. 148 F.3d 1231 (11th Cir. 1998).

184. See *id.* at 1249.

ity. It held that the county, which during the litigation had adopted a beach lighting ordinance based on a state model and drafted in consultation with federal officials, had not committed a take of the turtles.¹⁸⁵ Plaintiffs did not contend that the county had failed to enforce its ordinance. Furthermore, federal recovery plans for the turtles suggested that federal lighting standards would be adopted where local regulations proved inadequate.¹⁸⁶ As the court viewed the allegations, "Plaintiffs wish to hold the County liable for takings because its beach residents are not turning off their lights in compliance with the ordinance."¹⁸⁷ Accepting the court's statement of the facts, the decision seems unassailable. Regulatory bodies that adopt, and attempt in good faith to enforce, regulations to prevent take should not themselves face liability under the ESA if they do not manage to achieve perfect compliance.

Nonetheless, a regulatory body that specifically authorizes, or even simply fails to prohibit, actions that foreseeably take listed species, potentially including development projects or water connections, risks section 9 liability. In at least some locations, FWS appears to be suggesting that it might premise enforcement actions on that type of liability. For example, Professor J.B. Ruhl reports that FWS persuaded a water development agency in Texas "to condition user access to a new water supply line on construction standards designed . . . to avoid harm to an aquatic salamander species" on the theory that the water line would spur local growth, which could impair water quality through runoff, harming the species.¹⁸⁸

3. Exemptions from Liability

Notwithstanding the breadth of section 9, not every action that harms members of a listed species violates the take prohibition. There are three major avenues for exemption from section 9 liability, each of which has been invoked in connection with water conflicts.

185. See *Loggerhead Turtle v. County Council of Volusia County*, 92 F. Supp. 2d 1296, 1306–07 (M.D. Fla. 2000).

186. See *id.* at 1308.

187. *Id.* at 1307.

188. J.B. Ruhl, *Ecosystem Management, the ESA, and the Seven Degrees of Relevance*, 14 NAT. RESOURCES & ENV'T, 156, 161 (2000).

The first applies only to species listed as threatened rather than endangered. The full force of section 9 necessarily applies to endangered species but not to threatened ones. Section 4(d) of the ESA directs the Services to adopt regulations as necessary and advisable for the conservation of threatened species, up to the full application of section 9.¹⁸⁹ Therefore, section 4(d) rules can permit actions that would otherwise violate section 9, provided those actions are not inconsistent with conservation of the species, that is, with their progress toward recovery.¹⁹⁰ As an example, NMFS recently adopted section 4(d) rules exempting diverters who install and properly maintain approved fish screens from potential liability under section 9 for harm to a number of threatened west coast salmonids.¹⁹¹

The second exemption from section 9 liability applies when consultation under section 7 has resulted in a “no-jeopardy” biological opinion. Each “no jeopardy” opinion includes an incidental take statement specifying the extent of taking expected from the action. The Services may impose such reasonable and prudent measures as they deem necessary to reduce the impact of the taking, with the proviso that those measures must be consistent with the basic design of the action.¹⁹² Acts in compliance with the terms and conditions of an incidental take statement do not violate section 9.¹⁹³ Although the incidental take statement is issued to the consulting federal agency, it protects anyone whose actions are within its scope against liability under section 9.¹⁹⁴ But only take within the scope contemplated by the incidental take statement is protected. Take beyond those levels, such as the massive 1999 entrainment of

189. See 16 U.S.C. § 1533(d) (1994).

190. See *Sierra Club v. Clark*, 755 F.2d 608 (8th Cir. 1985); Holly Doremus, *Restoring Endangered Species: The Importance of Being Wild*, 23 HARV. ENVTL. L. REV. 1, 27–29 (1999).

191. See Final Rule Governing Take of 14 Threatened Salmon and Steelhead Evolutionarily Significant Units (ESUs), 65 Fed. Reg. 42,422, 42,479–80 (July 10, 2000). In an unpublished paper, Professor Robert Fischman argues persuasively that section 4(d) rules could supplant individual incidental take permits as the primary vehicle for authorizing activities that may affect threatened species. See generally Robert L. Fischman & Jaelith Hall-Rivera, *A Lesson for Conservation from Pollution Control Law: Cooperative Federalism for Recovery Under the Endangered Species Act* (Jan., 2001) (unpublished manuscript, on file with the author).

192. See 16 U.S.C. § 1536(b)(4) (1994); 50 C.F.R. 402.14(h) (1999).

193. See 16 U.S.C. § 1536(o)(2).

194. See *Ramsey v. Kantor*, 96 F.3d 434 (9th Cir. 1996).

smelt in the Delta pumps, violates section 9 and is supposed to trigger reinitiation of consultation.¹⁹⁵

Finally, take without a federal nexus can be authorized by an incidental take permit issued under section 10. The applicant for an incidental take permit must submit a habitat conservation plan (HCP) specifying the impact of the taking, the steps the applicant will take to minimize those impacts, the funding available for those steps, alternative actions considered and the reasons for rejecting them, and such other measures as the agency may require.¹⁹⁶ The permit shall be issued if the Service finds that: the taking is incidental to some other lawful activity; the impacts of the taking will be minimized and mitigated to the maximum extent practicable; adequate funding will be provided; and the taking will not appreciably reduce the likelihood of survival and recovery in the wild.¹⁹⁷ HCPs can include species that are not yet listed, providing advance authorization to take them should they later be added to the protected list.¹⁹⁸

Incidental take permits may run for as long as FWS determines is appropriate under the circumstances.¹⁹⁹ Terms as long as fifty or one hundred years are not unusual.²⁰⁰ During that term, the "No Surprises" policy protects the permit holder from increased mitigation obligations or restrictions due to un-

195. The most recent biological opinion on operation of the Delta pumps specifies the allowable take of smelt by month for wet and dry years. See DELTA BIOP, *supra* note 80, at 43. Those limits were exceeded in early summer 1999, and FWS expected to exceed them again in 2000. Telephone Interview with Paul Hanna, FWS (May 2000).

196. See 16 U.S.C. § 1539(a)(2)(A) (1994).

197. See *id.* § 1539(a)(2)(B). The last requirement essentially duplicates the regulatory definition of jeopardy. See *supra* text accompanying note 126. Because issuance of a section 10 permit is a federal action, section 7 also requires FWS to ensure that permit issuance is not likely to jeopardize the species. See United States Fish and Wildlife Serv. and National Marine Fisheries Serv., Endangered Species Habitat Conservation Planning Handbook 1–6 (1996) [hereinafter Conservation Planning Handbook] (noting that issuance of an incidental take permit is a federal action subject to section 7).

198. See Endangered and Threatened Wildlife and Plants; Prohibitions and Permits, 50 Fed. Reg. 39,681, 39,683 (Sept. 30, 1985) (explaining that HCPs can, but need not, cover unlisted species in the area).

199. See 50 C.F.R. § 17.22(b)(4) (1999).

200. Of the two dozen HCPs analyzed by Defenders of Wildlife in a 1998 report, six had terms of ninety-nine or one hundred years. See DEFENDERS OF WILDLIFE, FRAYED SAFETY NETS: CONSERVATION PLANNING UNDER THE ENDANGERED SPECIES ACT xiv–xv (1998).

foreseen circumstances.²⁰¹ If an approved HCP proves insufficient to protect the species, the government, rather than the permittee, bears the costs of providing the additional protections that turn out to be necessary.

Although most of the 313 HCPs approved as of August 2000 have dealt with terrestrial species,²⁰² water agencies and others have recently begun to seek them for aquatic species. The Edwards Aquifer Authority, for example, is in the process of developing an HCP.²⁰³ Large-scale HCPs are also in process for the Bay-Delta²⁰⁴ and lower Colorado River.²⁰⁵ Many smaller scale HCPs for municipal water supplies are in various stages of preparation and review.²⁰⁶

D. Section 2—Special Deference to State Water Law?

The ESA declares, among other things, that it is “the policy of Congress that Federal agencies shall cooperate with State and local agencies to resolve water resource issues in concert with conservation of endangered species.”²⁰⁷ This provision was added in 1982, after Congress considered but rejected an amendment that would have provided that the ESA did not supersede or abrogate state authority to allocate water, or existing state water rights.²⁰⁸

201. See 50 C.F.R. §§ 17.22(b)(5), 17.32(b)(5) (1999).

202. See U.S. Fish & Wildlife Service, *Endangered Species Habitat Conservation Planning*, at <http://endangered.fws.gov/hcp/index.html> (last updated Aug. 9, 2000).

203. See Edwards Aquifer Authority, *General Manager's Report*, at <http://www.e-aquifer.com/GMR/APRGMReport.pdf> (Apr. 2000).

204. See CALFED Bay-Delta Program, *Multi-Species Conservation Strategy*, Draft Programmatic EIS/EIR Technical Appendix, at http://www.calfed.water.ca.gov/adobe_pdf/revised_draft_eis_eir/310/310_intro-ch4.pdf (June 1999).

205. See Bureau of Reclamation, United States Dep't of the Interior, *Lower Colorado River Multi-Species Conservation Program*, at <http://www.lc.usbr.gov/~g2000/mscp.html> (last updated Aug. 2000).

206. See, e.g., Tacoma Public Utilities, Tacoma Water et al., Tacoma Water Habitat Conservation Plan: Green River Water Supply Operations and Watershed Protection (Public Review Draft, Dec. 1999) (on file with author); Seattle Public Utilities, Cedar River Habitat Conservation Plan (Public Comment Draft, Dec. 1998) (on file with author).

207. 16 U.S.C. § 1531(c)(2) (1994).

208. See A. Dan Tarlock, *The Endangered Species Act and Western Water Rights*, 20 LAND & WATER L. REV. 1, 19 (1985). The proposal was modeled on section 101(g) of the Clean Water Act, 33 U.S.C. § 1251(g) (1994).

Shortly after this section was added, Professor Dan Tarlock suggested that the relatively weak cooperation policy Congress had chosen indicated that integration of federal environmental values into state water law "should take place by the least intrusive means available . . ."²⁰⁹ Species protection strategies that require maintenance of minimum flows in conflict with state allocation schemes, he contended, should be the remedy of last resort, permitted only if other strategies are unlikely to succeed in protecting the species.²¹⁰ That view mirrors the subsequently-developed "Park City Principles," which call for "a general federal policy of recognizing and supporting the pivotal role of states in water management . . ."²¹¹

So far, however, courts have not read section (c)(2) as creating any judicially enforceable federal obligation or limit on federal action. Section (c)(2) has been mentioned in reported cases only three times. The Fifth Circuit cited it as evidence that the ESA does not preclude abstention by federal courts in favor of state administrative processes.²¹² A district court in California relied on it to allow irrigation districts standing to challenge a biological opinion.²¹³ The only extended discussion of section (c)(2) comes from the same court, which noted in another opinion:

This provision does not require, however, that state water rights should prevail over the restrictions set forth in the Act. Such an interpretation would render the Act a nullity. The Act provides no exemption from compliance to persons possessing state water rights, and thus the District's state water rights do not provide it with a special privilege to ignore the Endangered Species Act.²¹⁴

209. *Id.* at 29.

210. *See id.*

211. D. Craig Bell et al., *Retooling Western Water Management: The Park City Principles*, 31 LAND & WATER L. REV. 303, 306 (1996).

212. *See Sierra Club v. City of San Antonio* 112 F.3d 789, 798 (5th Cir. 1997).

213. *See Westlands Water Dist. v. United States Dep't of the Interior*, 850 F. Supp. 1388, 1424-25 (E.D. Cal. 1994).

214. *United States v. Glenn-Colusa Irrigation Dist.*, 788 F. Supp. 1126, 1134 (E.D. Cal. 1992). The court also noted that enforcement of the Act in this case "does not affect the District's water rights but only the manner in which it exercises those rights." *Id.*

Section (c)(2) does not soften the mandates of sections 7 and 9, but it does encourage federal agencies to seek state and local cooperation and input when addressing conflicts between human water uses and the needs of listed species.

III. EARLY LESSONS FROM CONTINUING CONFLICTS

We should not expect ever to see a final resolution of the conflicts between water-dependent species and growing urban populations. Westerners will always face competing demands for scarce water. Those competing demands must be addressed on an ongoing basis.

It is still early to draw firm conclusions, but our limited experience so far does suggest several tentative ones. First, the ESA is, and will remain, an important part of the regulatory landscape for municipal water agencies, who will need to understand not just the basics of the statute but its subtle nuances. Second, despite the ESA's importance, attention to the friction between municipal water needs and environmental protection cannot end with that statute. Third, the ESA will inevitably exacerbate existing tensions between competing water users by tightening restrictions on depletion of surface and groundwater supplies. Finally, pressures created by the ESA will encourage changes to state water, and possibly land use, law. The form those changes take will reflect the outcome of the political struggles incited by the ESA.

A. *The ESA is an Important Element of the Regulatory Landscape for Water Agencies*

The first lesson, which should be obvious from the discussion above, is that the ESA matters for municipal water suppliers and users. New residents will need water. Given the state of the West's rivers, the ESA will inevitably complicate the search for that water. As a result, municipal water agencies throughout the West will need expertise in the ESA that goes beyond the basics to the subtle unresolved issues, and the fortitude to face those issues in the overheated political atmosphere typical of ESA disputes.

One open question is whether the National Environmental Policy Act²¹⁵ applies to the designation of critical habitat²¹⁶ and, if so, how much environmental study it requires.²¹⁷ Another is the degree of specificity required in critical habitat designation, that is, whether it is sufficient simply to describe a stream segment as necessary to the species, or whether the Services must also specify required flow or water quality levels. Other issues likely to come up include the scope of the duty to conserve under section 7(a)(1),²¹⁸ the reach of "regulatory take" liability under section 9,²¹⁹ and the relationship between ESA obligations and interstate water compacts.

The complex of litigation involving the Rio Grande silvery minnow raises many of these issues, and illustrates the ways that municipal water issues can entangle cities in ESA disputes. A pair of lawsuits rests on the crucially important issue of the extent of federal control of water distribution in the middle Rio Grande. Albuquerque has filed suit to immunize its San Juan-Chama project water from any requirement that water be left in the Rio Grande to protect the silvery minnow. The city claims that the applicable legislation and compacts leave the United States no authority to withhold that water for ESA purposes.²²⁰ The Bureau of Reclamation seems to share the city's view. In a programmatic biological assessment prepared as part of the section 7 consultation process, the Bureau asserts that its authority to manage the waters of the Rio Grande is sharply limited.²²¹ A coalition of environmental

215. 42 U.S.C. §§ 4331-4370d.

216. That issue has split the courts of appeal. *Compare* *Catron County Bd. of Comm'rs v. United States Fish & Wildlife Serv.*, 75 F.3d 1429 (10th Cir. 1996) (holding NEPA applies), *with* *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995) (holding NEPA does not apply).

217. *See* *New Mexico Cattle Growers Ass'n v. United States Fish & Wildlife Serv.*, 81 F. Supp.2d 1141 (D.N.M. 1999) (upholding Finding of No Significant Impact for designation of critical habitat for the southwestern willow flycatcher).

218. *See supra* notes 112-22 and accompanying text.

219. *See supra* notes 182-88 and accompanying text.

220. *See* Plaintiff's Original Complaint, *City of Albuquerque v. United States*, (No. 99-0985) (D.N.M., Sept. 1, 1999) (on file with author).

221. *See* Bureau of Reclamation, United States Dep't of the Interior, & Corps of Engineers, United States Dep't of the Army, Programmatic Biological Assessment of Federal Discretionary Actions Related to Water Management on the Middle Rio Grande, New Mexico (Oct. 1999) (on file with author). The Biological Assessment does not even consider whether the Bureau might have the authority or indeed the obligation to withhold water under its delivery contracts.

groups, however, has challenged the biological assessment from the other perspective, charging that it drastically understates federal authority and obligations under the ESA.²²²

Similar claims have largely been resolved against irrigators, and there is no reason to suppose the city will fare any better. Its argument may be powerful politically, but it has little legal support. The scope of federal power over continuing actions is construed broadly for ESA purposes, as *Tennessee Valley Authority v. Hill* demonstrates.²²³ The San Juan-Chama project was authorized "for the purposes of furnishing water for the irrigation of irrigable and arable lands and for municipal, domestic, and industrial uses, providing recreation and fish and wildlife benefits, and controlling silt, and for other beneficial purposes."²²⁴ It is hardly a stretch to hold that broad statement of purposes consistent with application of the subsequently-enacted ESA.²²⁵

The Secretary's discretion is limited by Reclamation's obligation to meet water orders from users in accordance with contract obligations. In meeting these obligations, the Secretary exercises discretion in how water is stored in system reservoirs and released through federal facilities, but that discretion is narrowed by the constraints of contract requirements and delivery schedules.

Id. at 14.

222. See Plaintiff's Original Complaint, *Rio Grande Silvery Minnow v. Martinez*, (No. 99-1020) (D.N.M., Nov. 15, 1999) (on file with author).

223. See *supra* notes 141-142 and accompanying text.

224. Pub. L. No. 87-483, § 1, 76 Stat. 96 (1962). See also *id.* § 8, 76 Stat. at 97-98 (authorizing construction and operation of the initial stage of the San Juan-Chama project "for the principal purposes of furnishing water supplies to [specified lands] and for municipal, domestic, and industrial uses, and providing recreation and fish and wildlife benefits"; Pub. L. No. 84-485, 70 Stat. 105 (1956) (listing purposes of Colorado River Storage Project, of which San Juan-Chama project is a component, as "among others," regulating Colorado River flow, "storing water for beneficial consumptive use," making it possible for the upper basin states to use their compact apportionments, flood control, and power generation (emphasis added)).

225. Indeed, the purposes of the San Juan-Chama Project are as broad as those of the Washoe Project, which the Ninth Circuit has held permits strong federal action on behalf of endangered species. See *Carson-Truckee Water Conservancy Dist. v. Clark*, 741 F.2d 257 (9th Cir. 1984). The purposes of the Washoe Project are

furnishing water for the irrigation of approximately fifty thousand acres of land in the Carson and Truckee River Basins, Nevada and California, providing drainage services to approximately thirty-one thousand acres of land therein, firming the existing water supplies of lands under the Truckee River storage project and the Newlands project, controlling

The San Juan-Chama Project Act does invoke the Rio Grande Compact, requiring that the project be operated "in conformity with" that agreement.²²⁶ That does not, however, reduce the force of the ESA. Neither the Rio Grande Compact, nor any other existing interstate water compact, requires or authorizes the United States to ignore the plight of endangered species. The compact clause²²⁷ allows states to enter into agreements, but requires congressional consent to ensure that those agreements do not threaten national interests.²²⁸ States surrender their ability to unilaterally modify compacts when they submit them for congressional assent, because approved compacts become federal law. But approval of an interstate compact does not surrender federal authority over the subject matter. Congress remains free to withdraw its approval, or to alter the terms of interstate compacts to the full extent of its powers.²²⁹ Since the federal government enjoys plenary power

floods, providing hydroelectric power, development of fish and wildlife resources, and . . . other beneficial purposes.

P.L. No. 84-858, § 1, 70 Stat. 775 (1956).

226. See Pub. L. No. 87-483, § 8(c), 76 Stat. 96, 98; see also Pub. L. No. 84-485, § 2(3), 70 Stat. 105, 106 (requiring that storage for control and regulation of water imported from the San Juan River shall "be operated at all times . . . in strict compliance with the Rio Grande Compact").

227. U.S. CONST. art. I, § 10, cl. 3.

228. See Emanuel Celler, *Congress, Compacts, and Interstate Authorities*, 26 LAW & CONTEMP. PROBS. 682, 684-85 (1961); Felix Frankfurter & James M. Landis, *The Compact Clause of the Constitution—A Study in Interstate Adjustments*, 34 YALE L.J. 685, 695 (1925) ("The framers thus astutely created a mechanism of legal control over affairs that are projected beyond State lines and yet may not call for, nor be capable of, national treatment. They allowed interstate adjustments but duly safeguarded the national interest."); Jill Elaine Hasday, *Interstate Compacts in a Democratic Society: The Problem of Permanency*, 49 FLA. L. REV. 1, 11-12 (1997).

229. Commentators and courts are in virtually unanimous agreement that approval of an interstate compact does not limit subsequent congressional authority. See, e.g., *Pennsylvania v. Wheeling and Belmont Bridge Co.*, 59 U.S. 421, 433 (1855); *Riverside Irrigation Dist. v. Andrews*, 568 F. Supp. 583, 590 (D. Colo. 1983) ("A subsequent federal law of nationwide applicability will therefore be enforceable even if it affects a prior compact."), *aff'd on other grounds*, 758 F.2d 508 (10th Cir. 1985); Celler, *supra* note 228, at 685 (stating that because the compact clause requires Congress to protect the interests of both the nation and non-compacting states "congressional power cannot be limited to passing on a compact in the first instance, alone. The power must also include ability subsequently to alter, amend, or repeal the consent that has been given"); Erik G. Davis, *Interstate Compacts That Are For the Birds: A Proposal for Reconciling Federal Wetlands Protection with State Water Rights Through Federal-Interstate Compacts*, 10 BYU J. PUB. L. 325, 343-45 (1996); Frankfurter & Landis, *supra* note 228, at 726-27 (stating that by approving compacts, "Congress does not foreclose the future. If

to apportion interstate waters,²³⁰ it has full control over waters apportioned by compact. Those waters therefore remain subject to all subsequent federal legislation, including the ESA. Of course, to the extent possible, that federal power should be exercised equitably. Federal authorities should seek to ensure that the burdens of protecting endangered species are distributed fairly among all the users of interstate rivers. But no compact may force or permit federal authorities to stand by while compact fulfillment causes extinction.

Albuquerque has so far avoided joining the separate litigation over designation of critical habitat for the Rio Grande silvery minnow.²³¹ While that decision may well have been driven by the desire not to appear unconcerned with the fate of the minnow, it is a legally sensible one. The critical habitat issues are far less crucial for Albuquerque and other water suppliers than the scope of federal control over water distribution. As FWS has persuasively argued, critical habitat designation adds little to the prohibitions of sections 7 and 9.²³² Formal identification of critical habitat may help inform water suppliers and users of the scope of their ESA obligations, and may provide a political rallying point for opposition to endangered species protection, but it adds little to the regulatory mix. The exact procedures by which critical habitat is designated, and the specificity with which it is described, are of little substantive concern.

Undoubtedly, resolving the complex dispute over protection of the silvery minnow in the middle Rio Grande will require extended litigation, imposing financial costs on all parties and potentially leaving the city uncertain of its ability to serve the needs of present and future water customers for some time.

and when circumstances which now call for solution through compact change, Congress is wholly free to assume control"); Hasday, *supra* note 228, at 16 ("[T]he law is clear on Congress' ability to alter or entirely preempt compacts to which it has agreed, whether or not the original compact legislation specifically reserves that right."); Tarlock, *supra* note 208, at 24 ("[T]he answer must be that Congress has the power to alter compact allocations to achieve federal objectives."). Boundary compacts, which carry a special need for permanence, may be an exception to this general rule. See Hasday, *supra* note 228, at 16 n.69; *Rhode Island v. Massachusetts*, 37 U.S. 657, 725 (1838) (suggesting that Congress has no power to alter interstate compact resolving boundary dispute); *Poole v. Fleegeer*, 36 U.S. 185, 209 (1837) (suggesting the same).

230. See *Arizona v. California*, 373 U.S. 546 (1963).

231. See *supra* note 129 and accompanying text.

232. See *supra* note 128 and accompanying text.

Wisely, Albuquerque is not limiting its strategy to litigation. While the various lawsuits proceed, the city is a driving force behind formation of a collaborative process bringing federal, state, and local agencies together with irrigators and environmental groups to negotiate a solution.²³³ The outcome of this process is intended to "serve as the basis for compliance" with the ESA in the middle Rio Grande region.²³⁴ Of course, even negotiated ESA compliance raises sticky issues, including whether the collaborative group or its steering committee is subject to the Federal Advisory Committee Act,²³⁵ whether and to what extent the federal agencies can negotiate away their ESA authority and responsibility, and whether the various contending parties can be persuaded to forego litigation.²³⁶ These issues too have larger significance for the other collaborative processes underway in places like the Bay-Delta and Lower Colorado River.

As the Albuquerque experience suggests, water suppliers must become familiar with the nuances of the various options for ESA compliance. The most complete solution is an exemption from the ESA's strictures. Exemptions can be granted by the Endangered Species Committee²³⁷ or the legislature. Not surprisingly, however, the barriers to obtaining either type of exemption are high.²³⁸ Even for municipal water users, whose

233. See O'Dea, *supra* note 49, at 14.

234. Draft Cooperative Agreement Establishing the Middle Rio Grande Endangered Species Act Collaborative Program 1 (May 25, 2000) (on file with author).

235. 5 U.S.C. app. 2 §§ 1-15 (1994 & Supp. 1998). FACA requires that advisory committees have a formal agency charter, have balanced membership, and follow specified procedural guidelines. For descriptions of the law and its application to environmental decisionmaking, see Thomas J. Beierle & Rebecca Long, *Chilling Collaboration: The Federal Advisory Act and Stakeholder Involvement in Environmental Decisionmaking*, 29 ENVTL. L. REP. 10399 (1999); Stephen P. Croley and William F. Funk, *The Federal Advisory Committee Act and Good Government*, 14 YALE J. REG. 451 (1997).

236. One recent study suggests that, contrary to expectations, negotiated rule-making does not reduce litigation. See Cary Coglianesse, *Assessing Consensus: The Promise and Performance of Negotiated Rulemaking*, 46 DUKE L.J. 1255 (1997). Although the processes considered here are somewhat different than rulemaking, there is no obvious reason to expect them to show better success in pleasing all contending parties.

237. See 16 U.S.C. § 15636(e)-(o) (1994 & Supp. 1998). The Committee is popularly known as the "God Squad."

238. The congressional exemption may be the easier to obtain, since it is not subject to the difficult standards that govern the administrative exemption process. After the God Squad refused to exempt Tellico Dam from the law, Congress

claims have undeniable political appeal, exemptions will not come easily.

Short of an exemption, the regulatory requirements of the ESA can to some extent be avoided by convincing the Services not to list a species or to remove one already on the list. Political pressure may produce that result,²³⁹ but that strategy carries the distinct risk that a reviewing court will overturn the agency action. A more defensible way to avoid listing or justify delisting is through development of a conservation agreement ensuring sufficient protection to keep the species from endangered or threatened status.²⁴⁰ This method of avoiding listing is not without costs, though. In order to support a decision not to list, the agreement must include defined protective measures whose effectiveness can be demonstrated.²⁴¹

Where listing cannot be prevented or reversed, water agencies whose activities present little danger to a species listed as threatened may be able to convince the relevant Service to issue a special rule under section 4(d) exempting those activities from liability.²⁴²

stepped in and did so. See Zygmunt J.B. Plater, *The Embattled Social Utilities of the Endangered Species Act: A Noah Presumption and Caution Against Putting Gasmasks on the Canaries in the Coalmine*, 27 ENVTL. L. 845, 858–60 (1997).

239. Many commentators have noted the role of politics in ESA listing decisions. For a compilation, see Holly Doremus, *Delisting Endangered Species: An Aspirational Goal, Not a Realistic Expectation*, 30 ENVTL. L. REP. 10,434, 10,436 n.42 (2000). Although the ESA requires that listing and delisting decisions be made solely on the basis of the best available science, the standards for listing are surprisingly flexible, and agency decisions enjoy substantial deference from reviewing courts. See Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L.Q. 1029 (1997).

240. Such an agreement recently convinced FWS not to list the Pecos pupfish, native to New Mexico and Texas. See *Withdrawal of Proposed Rule to List the Pecos Pupfish (Cyprinodon pecosensis) as Endangered*, 65 Fed. Reg. 14,513 (Mar. 17, 2000).

241. Several recent decisions have held that the Services cannot rely on voluntary measures or development of future protective strategies to delay or avoid listing. See *Oregon Natural Resources Council v. Daley*, 6 F. Supp. 2d 1139 (D. Or. 1998); *Save Our Springs v. Babbitt*, 27 F. Supp. 2d 739 (W.D. Tex. 1997); *Biodiversity Legal Found. v. Babbitt*, 943 F. Supp. 23 (D.D.C. 1996); *Southwest Ctr. for Biological Diversity v. Babbitt*, 939 F. Supp. 49 (D.D.C. 1996). The Services have issued a draft policy explaining their view that voluntary and not yet implemented measures can be relied upon, provided their implementation and effectiveness is ascertainable. See *Announcement of Draft Policy for Evaluation of Conservation Efforts When Making Listing Decisions*, 65 Fed. Reg. 37,102 (June 13, 2000).

242. See *supra* text accompanying notes 196–198.

If that solution also is not available, either because the affected species is endangered, the proposed activity cannot plausibly be described as harmless, or the agencies are not cooperative, water suppliers will need to delve into the arcana of biological opinions and incidental take permits. Far more than in the case of terrestrial species, the section 7 consultation process and section 10 incidental take provision are closely intertwined with respect to aquatic species. Water projects, large and small, often combine federal and non-federal elements, both because the federal government plays such a large role in distribution of the region's waters²⁴³ and because construction in navigable waters requires federal approval.²⁴⁴ In the California Bay/Delta, for example, the parallel state and federal water projects both operate pumps that may kill listed species.²⁴⁵ Smaller local projects can also implicate both sections, as a proposal to upgrade the city of Tacoma, Washington's municipal water system illustrates. That project includes both modifications to the city's privately-owned diversion facilities and addition of storage capacity to a Corps of Engineers reservoir.²⁴⁶ These and other combined projects require both section 7 consultation for the federal portion and a section 10 incidental take permit for the non-federal portion.

Water agencies and federal officials will need to figure out how the section 7 consultation process can work in concert with the section 10 incidental permit process where these overlaps occur. The two provisions were drafted at different times and with different ends in view. Combining them is awkward, because their standards are somewhat different.

From the point of view of a water supplier or municipality, the most important difference between the two processes may be in the degree of certainty they provide. Section 10 permits typically include "No Surprises" clauses that assure permittees that the permitted action can continue without additional mitigation even if a species adequately covered in the habitat conservation plan unexpectedly declines. Section 7 provides no

243. Bureau of Reclamation projects irrigate about half of all the surface-water-irrigated acreage in the West. See Moore et al., *supra* note 2, at 333.

244. See 33 U.S.C. § 403 (1994).

245. See DELTA BIOP, *supra* note 80, at 195.

246. See Tacoma Public Utilities, Tacoma Water et al., Tacoma Water Habitat Conservation Plan: Green River Water Supply Operations and Watershed Protection 2-9 to 2-20 (Public Review Draft, Dec. 1999) (on file with author).

such certainty. So long as federal action remains, changed circumstances can require reinitiation of consultation, which may produce a jeopardy conclusion.²⁴⁷

In partial compensation for this complication, large water projects seem particularly suited for regional, ecosystem-wide processes to resolve ESA issues.²⁴⁸ Intricate and complex as these projects are, they have already created extensive administrative systems, the relevant parties are known, and the distribution of water is typically controlled by one or a small number of entities. Ecosystem-scale processes currently underway in California's Bay-Delta, the upper and lower Colorado River basins, and the Columbia River system may provide practical opportunities to work out the interface between section 7 and section 10. Not surprisingly, however, such ecosystem-scale processes are expensive and time consuming. Although they have been ongoing for many years now, the efficacy of these efforts in the Colorado, Columbia, and Bay-Delta basins remains to be demonstrated.

B. The ESA Cannot Be the Only Tool for Resolving Conflicts Between Municipal and Environmental Water Demands

Although the ESA is an important element of the water conflict picture, it is hardly the entire canvas. Indeed, the fate of smelt in the Delta pumps and silvery minnows in the Rio Grande in recent dry years shows that simply having a law in place that demands protection of listed species does not guarantee that protection occurs. Furthermore, the details of ESA compliance may matter a great deal, determining, for example, the distribution of burdens of compliance among water users. Those details come not from the ESA itself, but from state wa-

247. See *supra* text accompanying note 140. Another advantage sometimes cited for the HCP approach is the ability to provide for species that are not yet listed. See Conservation Planning Handbook, *supra* note 197, 4-1 to 4-4. But section 7 may allow the same approach. Although regulations require reinitiation of consultation in response to new listings, see 50 C.F.R. § 402.16 (1999), it is possible to read that provision to apply only to species not considered in the earlier consultation. Indeed, the 1995 biological opinion on operation of the Central Valley Project and State Water Project included consideration of the Sacramento splittail, which at the time was proposed for listing. See DELTA BIOP, *supra* note 80. Consultation was not reinitiated after listing of the splittail was finalized.

248. See Wood, *supra* note 63, at 231-32.

ter law and the pragmatic realities of the status quo. Water agencies (and their adversaries), therefore, would be well advised not to forget about other legal and political hurdles or pathways.

The law alone rarely determines the outcome of endangered species conflicts. Political pressures can and do skew listing decisions²⁴⁹ and biological opinions.²⁵⁰ Indeed, those pressures affect nearly every aspect of ESA implementation.²⁵¹ They come into play in the enforcement context, as the reluctance of FWS to bring enforcement actions against Edwards Aquifer pumpers demonstrates.²⁵² They have surely played a role in the failure to reinstate consultation on the impacts of the Delta pumps after severe overruns of the incidental take statement in the biological opinion.²⁵³

In addition, the legal and practical background determines how the demands imposed by the ESA are distributed. In the context of terrestrial species, both section 9 and section 7 strongly favor established developments, which have completed their harmful impacts, over new ones. Construction of a subdivision, for example, inevitably "takes" wildlife that once occupied that land. But early developers often accomplish that take before any of the species decline to the point of listing under the ESA. When listing occurs, years later, those developers have no liability under section 9. A similar analysis applies with respect to section 7. Consultation proceeds project-by-project, and each new project is evaluated on the basis of the existing environmental baseline, which includes the effects of all prior actions, contemporaneous non-federal actions, and proposed federal actions that have already undergone consultation.²⁵⁴ First in time tends to be first in right in terms of the

249. See *supra* note 239.

250. See, e.g., Blumm & Corbin, *supra* note 85, at 604 (suggesting that NMFS engages in "agenda-driven science" in consultations over Columbia River actions); Steven A. Daugherty, Comment, *Threatened Owls and Endangered Salmon: Implementing the Consultation Requirements of the Endangered Species Act*, 14 PUB. LAND L. REV. 203, 253 (1993) (concluding that political factors "obviously" played a role in 1992 no-jeopardy opinion for Columbia River operations).

251. A classic description of the political influences on ESA implementation is Oliver A. Houck, *The Endangered Species Act and Its Implementation by the U.S. Departments of Interior and Commerce*, 64 U. COLO. L. REV. 277 (1993).

252. See *supra* note 175 and accompanying text.

253. See *supra* note 195 and accompanying text.

254. See 50 C.F.R. § 402.02 (1999) (definition of "effects of the action"); Opinion of the Office of Solicitor, Cumulative Impacts Under Section 7 of the En-

opportunity to consume the available increment of species and their habitat.

This tendency to concentrate costs on latecomers, which has frequently been decried as unfair,²⁵⁵ is less pronounced with respect to the conflict between aquatic species and water projects. Although the harm of construction typically is accomplished at a single point in time, just as for terrestrial species, maintenance and operation of diversion, storage, and other facilities in rivers and streams have ongoing effects which remain subject to the ESA. Operation of federal water projects, for example, requires ongoing consultation, and water contracts will not protect the customers against ESA-induced shortages.²⁵⁶ Even with respect to private facilities, take by dams that block passage to spawning habitat or diversions that entrain fish continues until the species is extinct or locally extirpated.

Nonetheless, the burdens of the ESA still generally fall most heavily on latecomers to the water, just as they do on latecomers to the land. As a matter of political reality, the status quo is difficult to change, even when the law seems to call for changes. No federal agency is likely to demand removal of a large dam or idling of a substantial irrigation project if any other option is available.²⁵⁷ The most recent diverters are most vulnerable to section 9 take liability if a stream suddenly falls below the levels necessary to sustain a listed species. Existing facilities and diversions are part of the baseline on which section 7 consultations for new facilities or diversions with a fed-

dangered Species Act, 88 Interior Dec. 903, 905 (1981) (“[S]ec[ti]on 7 provides a ‘first-in-time, first-in-right’ process whereby the authorization of federal projects may proceed until it is determined that further actions are likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat.”).

255. See, e.g., Bradley C. Karkkainen, *Biodiversity and Land*, 83 CORNELL L. REV. 1, 92–93 (1997); Barton H. Thompson, Jr., *The Endangered Species Act: A Case Study in Takings and Incentives*, 49 STAN. L. REV. 305, 360–61 (1997).

256. See *supra* text accompanying notes 143–148.

257. See, e.g., Volkman, *supra* note 20, at 61–62 (noting that ESA implementation tends to follow “the path of less resistance,” and that agencies are reluctant to call for drastic changes in existing operations). Cf. Reed D. Benson, *Maintaining the Status Quo: Protecting Established Water Uses in the Pacific Northwest, Despite the Rules of Prior Appropriation*, 28 ENVTL. L. 881 (1998) (noting ways in which rules of state water law are frequently bent to accommodate the status quo).

eral nexus are based.²⁵⁸ Furthermore, if diversions must be curtailed to prevent jeopardy or take, the law of prior appropriation will allocate the limited available water to senior users.

Even without these practical complications, the ESA alone simply cannot resolve the West's water conflicts in a way that accommodates the needs of the environment. Although major river systems are prime candidates for section 7 consultations and section 10 incidental take permit applications covering a large geographic scope, the ESA itself tends to discourage a truly ecosystem-based approach by demanding that the Services focus on individual species mortality.²⁵⁹ Nor does the ESA provide practical mechanisms for addressing all the problems afflicting western rivers. Nonpoint source pollution provides one striking example. Runoff from farm fields and urban areas causes problems for listed species in the Pacific Northwest and elsewhere.²⁶⁰ Section 7 is powerless against these impacts, because nonpoint source discharges are not subject to federal approval. Section 9 is almost equally impotent, because of the difficulty of proving harm and, if that hurdle can be surmounted, tying that harm to runoff from particular property. The recent reinvigoration of the Clean Water Act's TMDL (total maximum daily load) program provides the best hope for addressing nonpoint source problems for endangered species. A district court in California has upheld application of the TMDL requirement

258. Computation of the environmental baseline in this fashion has been a sore point for Native Americans for years. Although tribes often hold substantial reserved water rights with senior priority dates, those rights have been developed only slowly. Development of those rights, which inevitably requires federal approval or federal funding, can now be blocked by section 7 consultation if development of less senior non-Native American water rights has consumed all the water not needed by listed species. Although federal agencies have been encouraged to consider the future effects of senior water rights in consultation, that is difficult when those rights are unquantified, as tribal reserved rights often are. See Tim Vollman, *The Endangered Species Act and Indian Water Rights*, NAT. RESOURCES & ENV'T., 39, 41-43 (1996). To the extent they are quantified or quantifiable, however, unexercised Indian water rights should be included in baseline calculations, as a recent report to the Department of Interior argues. See United States Dep't of the Interior, *Report of the Working Group on the Endangered Species Act and Indian Water Rights: Implementation of Section 7 of the ESA in Relation to Indian Water Resource Development*, at http://www.doi.gov/feature/es_wr/report.htm (visited Nov. 2, 2000).

259. John Volkman has noted this shortcoming in the context of Columbia River salmon. See Volkman, *supra* note 20, at 138-39.

260. See *supra* notes 37-38 and accompanying text.

to a stream impaired only by nonpoint pollution.²⁶¹ That decision, should it hold up on appeal, will bring a large proportion of the nation's stream miles under the umbrella of the TMDL program. That, in turn, will both provide a federal hook for application of section 7 and increase the political pressure on the states to control nonpoint source pollution.

C. ESA Conflicts Heighten Tensions Between Water Users

The conflicts the ESA has begun to bring to the forefront are not simply between urban uses of water and the needs of aquatic species. In reality, they are conflicts between aquatic species and the total of human uses, which have already pushed many western rivers to their limit. By increasing the pressure to reduce total diversions, the ESA will inevitably exacerbate existing tensions between urban and agricultural water users. Although there may well be enough water available to support continued urban growth for the foreseeable future, much of it will have to come from existing agricultural uses.²⁶²

Although the ESA is facially agnostic about distribution of the burdens of supporting wildlife among water users, as explained above, more recent diverters are likely to feel the brunt of its impact. Because the urban expansion of the West postdates its irrigation, urban users may be particularly hard hit by endangered species problems unless they can acquire existing agricultural water rights. The difficulties for municipal users are exacerbated by federal reclamation law, which generally favors agricultural users. Although the Reclamation Act permits provision of water from federal reclamation projects for municipal use, municipal contracts must not "impair the efficiency of the project for irrigation purposes."²⁶³

Despite these handicaps, municipal water uses hold both economic and political advantages over irrigated agriculture.

261. See *Pronsolino v. Marcus*, 91 F. Supp. 2d 1337 (N.D. Cal. 2000).

262. Municipalities may also find themselves drawn into conflicts between Native Americans, who have not yet been able to fully develop their water rights, and others whose rights are theoretically junior but already developed. See *supra* note 258.

263. 43 U.S.C. § 485h(c) (1994). That provision does not affect Albuquerque because Congress has exempted the San Juan-Chama Project from it. See Pub. L. No. 84-485, § 4, 70 Stat. 105, 107 (1956) (exempting municipal water supply contracts under the Colorado River storage project and participating projects, which include the San Juan-Chama project).

In most of the West, the economic value of municipal and industrial water use today far exceeds that of agricultural use.²⁶⁴ Politically, it would probably be impossible to deny water to people already living in an area, and all the forces that promote population growth promote the provision of water to support that growth. The ESA, therefore, will add to the political pressure to facilitate transfers of water from agricultural to urban uses.

D. The ESA Can Encourage Changes to State Law

Although it often takes an apparent crisis or “train wreck” to force the issue, the looming threat of the ESA can encourage state and local governments to take actions they might otherwise avoid. The ESA poses a two-pronged threat. First, it can potentially put federal authorities directly in control of regulatory functions viewed by state or local officials as their core turf, including land use planning and water distribution. Second, state or local regulators may reasonably fear liability under section 9 for take made possible by their decisions.²⁶⁵ This powerful one-two punch makes the ESA a strong incentive for changing old laws that are out of step with modern environmental sensibilities.²⁶⁶

Changes driven by the intersection of the ESA with municipal water interests can already be observed. In Texas, the Edwards Aquifer crisis has led to the local overthrow of deeply entrenched law. Texas had applied the unrestrained law of capture to its groundwater resources since the beginning of the twentieth century. That law allowed landowners to extract as much water as their pumps would permit, provided they could

264. See, e.g., NATIONAL RESEARCH COUNCIL, A NEW ERA FOR IRRIGATION 2 (1996) (describing irrigated agriculture as “the largest and most economically marginal user of water in the many water-scarce areas”); Fort, *supra* note 49, at 21 (quoting a study of the upper Rio Grande basin that concluded that “at the margin, the value of water used for irrigation is no greater than zero”); Getches, *Colorado River Governance*, *supra* note 64, at 586 & n.59 (noting that recreation and wildlife uses often have far greater economic value than irrigation).

265. See *supra* text accompanying notes 182–188.

266. It has already been credited with pushing state and local authorities toward change in a variety of contexts. See, e.g., Fort, *supra* note 49, at 36 (noting that ESA has forced watershed planning efforts in the Rio Grande); Volkman, *supra* note 20, at 60–61 (crediting the ESA with an important role in prompting regional efforts to address salmon decline).

use it. Under that regime, a single catfish farm reportedly took up to forty million gallons per day from the Edwards Aquifer, nearly one-fourth the usage of the entire city of San Antonio.²⁶⁷ Faced with the prospect of federal regulation of groundwater pumping, the state finally moved to establish a regulatory agency to oversee and limit withdrawals from the aquifer.²⁶⁸

The rules governing water transfers from agriculture to municipal uses are one place the ESA's pressures will surely be felt.²⁶⁹ Although water marketing has been touted by urban interests and some environmentalists as a solution to the West's perpetual water crisis, transfers from agricultural to urban use have run into political as well as technical difficulties.²⁷⁰ By increasing the pressure for such transfers, the ESA provides an incentive to overcome the barriers.²⁷¹ It will force western jurisdictions to confront tough political choices head-on. The outcome will have a profound effect on the face of the future West. The growing urban majority can simply overpower the objections of agricultural communities, or it can seek transfer mechanisms more sensitive to the needs of those communities.²⁷²

Another way ESA-driven water conflicts may shape western cities is through pressures to increase water conservation. A fixed amount of water can support more people if landscape irrigation is restricted, by regulatory means or financial incentives, or other conservation measures are adopted. The ESA can be added to the list of factors pushing the West toward high-efficiency plumbing fixtures, metered water rates, and drought-tolerant native landscaping.

267. See Votteler, *supra* note 40, at 855.

268. See *id.* at 860-61, 867-68; Kaiser & Phillips, *supra* note 40, at 423-26.

269. See, e.g., Brian E. Gray, *The Shape of Transfers to Come: A Model Water Transfer Act for California*, 4 HASTINGS W.-N.W. J. ENVTL. L. & POLY 23 (1996); Lawrence J. MacDonnell & Teresa A. Rice, *Moving Agricultural Water to Cities: The Search for Smarter Approaches*, 2 HASTINGS W.-N.W. J. ENVTL. L. & POLY 27 (1994).

270. For a thoughtful discussion of the non-economic bases of resistance to these transfers, see Tarlock, *supra* note 19.

271. For examples of such barriers, see Jennifer L. Cordua, Comment, *The Search for New Supplies: Salvaging the Remains of Agricultural Water Conservation in California*, 31 U.C. DAVIS L. REV. 591 (1998) (detailing uncertainties associated with transfer of "conserved" water).

272. Some suggestions are offered in MacDonnell & Rice, *supra* note 269, at 27.

It is more difficult to predict whether the ESA will provide sufficient incentives to push states and localities toward coordination of land use and water supply decisions. Although land and water use are inextricably linked, water planning is currently sharply divorced from land use decision making in most western states. Dan Tarlock and Sarah Van de Wetering have recently described in detail the ways that law and tradition in the West discourage the integration of land and water planning, as well as the forces eroding that historic separation.²⁷³ The ESA provides an added nudge in that direction.

Local governments that approve growth, with attendant increases in water consumption, risk both liability for any take that results and the prospect that their residents could be left thirsty by ESA-imposed water restrictions. The legal connection is indirect, complicated by the possibility of water conservation measures or acquisition of water from other sources. Political pressures will also tend to diminish the likelihood of legal liability. Courts may well be reluctant to require land use agencies to push the limits of their authority. Certainly federal regulators are unlikely to pursue such claims. But the political connection just may be sufficient to encourage risk-averse local officials to pressure state legislative or regulatory bodies for the authority, or even the mandate, to factor water supplies into land use planning. In turn, those legislators or regulators may see modification of the status quo as preferable to surrendering control of water resources to federal regulators or federal courts. It is possible, therefore, that the ESA, even without directly requiring consideration of water supply issues in land use decisions, could push states toward imposing such a requirement.

CONCLUSION

Municipal water suppliers in the West, already facing scarce supplies in the over-appropriated West, will inevitably find their task complicated in the future by the need to protect endangered and threatened aquatic species. For much of the West, this is a problem without a technological fix. Although

273. See A. Dan Tarlock & Sarah B. Van de Wetering, *Growth Management and Western Water Law: From Urban Oases to Archipelagos*, 5 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 163 (1999).

water can be moved from place to place by engineering, the supply cannot readily be enlarged.²⁷⁴ That means there is no painless solution. In many parts of the West, some one (or some fish) will have to give up water so others may have more.

In order to serve their customers in the world of limited water and dwindling aquatic species, municipal water agencies will need to add expertise in the arcana of endangered species law to their knowledge of federal and state water doctrines. The ESA will increase the pressure to reallocate water from agricultural uses, which are of dwindling economic importance, to municipal and industrial ones. It will also encourage evolution of state water law to a form more in tune with today's world, one that takes into account the plight of other species as well as human desires. The most important change, in many areas, would be a firm link between land use and water supply planning. If the ESA can help forge that link in the long term, the short-term pain it will cause until that connection is made may bring substantial gains.

The challenge is squarely set before the residents of today's West—to finally acknowledge the limits of the region's water resources, and shape our lifestyles to fit those limits, rather than seeking to alter the region's water balance to accommodate a lifestyle suited to a much wetter climate. Success will mean creating western communities hospitable both to humans and to other species. Failure will mean greatly diminished aquatic ecosystems, and diminished quality of life for the West's people.

274. In coastal areas, desalinization of ocean waters is technically feasible. See WATER IN THE WEST, *supra* note 1, at 3-11. Desalinization, however, is an energy-intensive and therefore expensive process, and transport of desalted water from the coasts to the inland West would be even more expensive. Desalinization, therefore, is no magic bullet poised to slay the west's water problems. Weather modification is another potential technological cure, but its efficacy is largely untested. See *id.* at 3-12.