

# EXISTING REGULATORY AND NONREGULATORY PROGRAMS

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## **SURVEY OF RIPARIAN AREA PROTECTION PROGRAMS**

The 1992 legislation directed the RAAC to "study the components of a riparian area protection program, including the provisions and activities conducted under this act, in comparison with other state and federal programs, including goal statements, regulatory methodologies, evaluation criteria, coordination with existing state and federal programs and guidelines, mitigation, incentives, funding mechanisms, public notification, education and involvement, enforcement and other elements that are essential to a successful riparian area protection program."

This directive was accomplished by members of the Riparian Area Technical Subcommittee (RATS) and the team from Arizona State University (ASU). The RATS evaluated regulatory programs that are used in Arizona for the direct and indirect protection they offer riparian areas. ASU evaluated nonregulatory programs in Arizona and regulatory and nonregulatory programs outside of Arizona.

### **METHOD TO EVALUATE EXISTING REGULATORY PROGRAMS IN ARIZONA**

Initially, the RAAC directed the RATS to evaluate the regulatory mechanisms that were being used on an actual perennial river in Arizona. The Verde River was selected as the case study because of the considerable work that has been done on the Verde River, such as the Advanced Identification and the Verde River Corridor Study.

To develop the framework for the evaluation the RATS used the three agencies reports. The report by the Arizona Game and Fish Department, *Arizona Riparian Inventory and Mapping Project* presented a listing of existing state and federal riparian and wetland protection programs and mechanisms. The Arizona Department of Environmental Quality's report *Evaluation of Activities Occurring in Riparian Areas* identified 13 activities that directly or indirectly effect the functionality of riparian areas. The effect of groundwater pumping, new surface water appropriations, and changes in the use or point of diversion of existing surface water appropriations were evaluated in *Riparian Protection Program - Legislative Report* by the Arizona Department of Water Resources.

The evaluation of regulatory programs on the Verde River was limited in the activities addressed. Timber harvesting, for example, was considered a marginal issue because it occurs on such a small scale and is related primarily to mesquite harvesting. Therefore the scope of the evaluation was broadened to reviewing activities statewide and examining how existing programs directly or indirectly provided protection to riparian areas.

A list of five major issues, developed by the RAAC Steering Committee (Appendix A) which identified problems and possible solutions related to impacts to riparian areas. This list of major issues was paired with activities that impact riparian areas as shown in Table 1. Regulatory programs at the local, state, and federal levels that address these activities through regulatory measures, policy statements, or management plans were identified. Whenever possible, the agency that has the authority to implement particular regulations was contacted to provide information. If someone was not contacted, knowledge and experience was utilized to make the evaluation.

Table 2. Five major issues and associated activities that impact riparian areas

ISSUES	ACTIVITIES
<b>Water Availability</b>	Groundwater pumping Surface water diversion Water release patterns from reservoirs
<b>Large-scale destruction or alteration of river channels</b>	Sand & Gravel mining Dredging & Filling Landfills Road construction Channelization & bank stabilization Inundation by new reservoir construction & releases
<b>Adjacent land uses</b>	Grazing Timber Harvesting Agriculture activities Mining Road construction Commercial/residential/industrial development Recreational uses
<b>Effluent and Point Sources</b>	Effluent discharges
<b>Restoration &amp; Exotic Species</b>	Management of exotic species Management for Threatened & Endangered Species Wildlife habitat management Enhancement of riparian areas

Regulations were evaluated for their capability to provide direct and indirect protection for riparian areas by rating their potential for effectiveness. Protection was defined by the RATS to mean:

"Any regulation, policy, guidance or plan that serves in some degree to mitigate, eliminate, restrict or minimize activities which may directly or indirectly cause adverse impacts to riparian areas."

Some policies and regulations are relatively new and improvements in the condition of riparian areas have not been observed. However, with time the policies and regulations should provide for better management and improved conditions of riparian areas if properly implemented.

Table 3 is a matrix of local, state and federal regulations that were rated. Numbers indicate the level of protection to riparian areas a regulation offers. Laws and regulations that directly or indirectly address riparian areas or where specific examples in Arizona were known where these laws and regulations have been used generally offer high protection and were rated 3. Laws and regulations that have the potential to protect but implementation or results have not been seen in Arizona were rated as offering moderate protection and were rated 2. Management plans, policies, and technical assistance generally offer low or incidental protection and were rated 1. Laws and regulations that offer no protection were rated 0. Regulations that either do not apply to a particular activity or the level of protection was not known were left blank.

Programs that address activities but are variable due to geographic location of an activity (e.g., ordinary high water mark for Clean Water Act), final decision of project (e.g., NEPA), or some

other factor that can directly impact riparian areas were rated with two numbers. The first rating indicates a site specific example and the general overall protection a program offers for riparian areas is indicated by the second. To clarify, sand and gravel activities were rated 3/2 for Clean Water Act Section 401. Protection is high (rated 3) if these activities occur within the ordinary high water mark or delineated wetlands due to review of project design and terms and conditions set in the 401 certification. Protection is moderate (rated 2) because the program does not restrict impacts to riparian areas.

Programs that were rated high to moderate, or at first glance might be thought to provide some level of protection to riparian areas are indicated in the matrix by shading. Shaded programs are described and their strengths and weaknesses are highlighted.

Table 3. Existing regulatory laws and regulations in Arizona that apply to riparian areas

ACTIVITIES vs. REGULATIONS	Groundwater Pumping	Surface water diversion	Water release patterns	Sand & gravel mining	Dredging & filling	Landfills	Road construction	Channelization & bank stabilization	Inundation by new reservoir releases	Grazing	Timber harvesting	Agriculture activities	Mining & Metallurgical Operations	Commercial/Residential/Industrial development	Recreational uses	Effluent discharges	Restoration
<b>FEDERAL</b>																	
Clean Water Act, Sec. 404/ Sec. 10 Rivers & Harbors Act		1		3/2	3/2	3	2	3/2	2	0			3	3/2		0	
Wilderness Act					3		3/2	3		1/0	3		3/2		3		
Wild & Scenic River Act		2	2/0	3	2			3	3/0	2	3		2	2	3/2		
Endangered Species Act	3/2	3/2	2/1	3/2	3/2	3/2	3/2	3/2	2	3			3/2	3/2	3		
National Environmental Policy Act	2	2/1		1	2/1		2	2	2/1	2/1			2		2		
BLM Management Plans				2/1	2/1		2			3/2	3/2		2/1		1		
USFS Management Plans				2/1	2/1		2			3/2	3/2		2/1		1		
BOR Wetland/Riparian Policy				3/2	3/2	3	2/1	3/2	2/1						2/1	3	3
Clean Water Act, Sec. 402 (NPDES)							2/1	1/0					2	2		3/0	
Emergency Wetlands Resources Act							1										
Federal Power Act (Federal Energy Regulatory Commission)																	
Federal Reserved Water Rights	3/2	3/2															
Fish & Wildlife Coordination Act				2	2		2		2/0								
Surface Mining Control and Reclamation Act of 1977																	
Water Project Recreation Act									1								

## ACTIVITIES vs. REGULATIONS

	Groundwater Pumping	Surface water diversion	Water release patterns	Sand & gravel mining	Dredging & filling	Landfills	Road construction	Channelization & bank stabilization	Inundation by new reservoir releases	Grazing	Timber harvesting	Agriculture activities	Mining & Metallurgical Operations	Commercial/Residential/Industrial development	Recreational uses	Effluent discharges	Restoration
National Historical Preservation Act					1/0			2									
Minerals & Materials Act, 1947			2/1				1								1/0		
Farmland Protection Policy Act												2/1					
Water Bank Act			2/1				2/1										
Department of Transportation Act							1										
Surface Transportation & Uniform Relocation Assistance Act							1										
Taylor Grazing Act										1							
BLM Range Regulations										3/2							
BLM Regulations 43 CFR 3809													1				
Public Rangelands Improvement Act (1978)										2							
Forest and Range Renewable Resource Planning Act (1974)			1		1					2	2						
U.S. Forest Service Manual										3/2	3/2				2/1		
U.S. Forest Service Organic Act										2	2						
Ft. McDowell Water Settlement Act																	

ACTIVITIES vs. REGULATIONS		Groundwater Pumping	Surface water diversion	Water release patterns	Sand & gravel mining	Dredging & filling	Landfills	Road construction	Channelization & bank stabilization	Inundation by new reservoir releases	Grazing	Timber harvesting	Agriculture activities	Mining & Metallurgical Operations	Commercial/Residential/Industrial development	Recreational uses	Effluent discharges	Restoration
STATE					3/2	3/2	3		3/2	1							3/0	
Clean Water Act, Sec. 401					0	0	0	1/0	0		0	1/0	1/0	0	0	0		
ADEQ Nonpoint Source Management Program					3/0	3/0	3/0		2/0		1						3/0	
Surface Water Quality Standards					0	0	0		1/0						1/0			
Arizona Native Plant Law																		
Groundwater Management Act (1980)															2		0	
Groundwater Rights	2/0																0	
Groundwater Basin Transfer Law	3																	
Groundwater Recharge Program																		
Effluent Regulation																		
General Surface Water Rights		2/1	2/1														0	
Instream Flow Rights			2															
Adjudication of Water Rights	2	2																
Water Right Sever & Transfer			2															
Executive Order 91-6			1		2	2	3/2	2	3/2		1	1		2	2	1		
Antidegradation Standards																		
Unique Waters Designation					3	3	3	2	3		1	3/2					3/0	
Aquifer Protection Permit														1	1		1/0	



	Groundwater Pumping	Surface water diversion	Water release patterns	Sand & gravel mining	Dredging & filling	Landfills	Road construction	Channelization & bank stabilization	Inundation by new reservoir releases	Grazing	Timber harvesting	Agriculture activities	Mining & Metallurgical Operations	Commercial/Residential/Industrial development	Recreational uses	Effluent discharges	Restoration
<b>ACTIVITIES vs. REGULATIONS</b>																	
Riparian Ecosystem Strategic Plan (1989) State Lands					1			1					1				
State Land Mineral Leasing, A.R.S. 27-251													3				
ADOT Standards Specifications for Road & Bridge Construction							2/1	1									
Solid Waste Facilities A.R.S. 49-767					1	3											
State Land Code A.R.S. 37-										1	1	1					

ACTIVITIES vs. REGULATIONS	Groundwater Pumping	Surface water diversion	Water release patterns	Sand & gravel mining	Dredging & filling	Landfills	Road construction	Channelization & bank stabilization	Inundation by new reservoir releases	Grazing	Timber harvesting	Agriculture activities	Mining & Metallurgical Operations	Commercial/Residential/Industrial development	Recreational uses	Effluent discharges	Restoration
<b>LOCAL</b>																	
Flood Plain Ordinances (Delineated flood plains)				1	0	1	1	1	1	1	0		2/1	1		1	
Zoning Ordinances & Planning Amendments							2/1	1						2			
Pima County Floodplain and Erosion Hazard Management Ordinance																	
City & County General Land Use Plans								0						2			
Local & County Septic Regulations														1			
Tucson Ordinance				3				2/1								0	
Scottsdale Environmentally Sensitive Lands Ordinance				2				3/2									
Scottsdale Native Plants Ordinance				2/1													
Camp Verde Mining Ordinances				1				1									
Flagstaff Ordinance								1			2						

## REGULATORY PROGRAMS IN ARIZONA

### FEDERAL PROGRAMS

There are no federal regulatory programs have been enacted to specifically address protection of riparian areas. However, a number of regulations do provide limited protection of these resources. Federal programs that specifically address wetland protection do provide incidental protection of riparian areas, as well as provide needed funding for state efforts.

Because of the broad scope of federal programs, many of these programs are applicable to Arizona and will be described in this section of the report. Although programs such as the Coastal Zone Management Act (CZMA) does not impact inland states like Arizona, it has had national implications for protecting wetlands and is included for completeness.

#### **Clean Water Act Section 404**

[Rank: High to moderate for activities typically requiring permit, to no protection]

At the federal level, the Clean Water Act (CWA)(33 USC 1251-1376) is the principal law affecting wetlands. Its purpose is to "restore and maintain the chemical, physical and biological integrity of our Nation's waters" (33 USC 1251). While the definition of "waters" includes wetlands, it does not specifically include riparian areas. Therefore, riparian areas are not directly regulated or protected under the CWA, although some riparian areas may indirectly receive protection.

Two major provisions of the CWA, Section 404 and Section 401, have an impact on wetlands and riparian areas. Section 404 regulates activities that result in a discharge to waters of the United States, and Section 401 requires that these actions meet the state water quality standards and regulations. Section 404 was created in 1972 as part of the comprehensive amendments to the Federal Water Pollution Control Act, now commonly called the Clean Water Act.

The Section 404 program is administered jointly by the Corps and the EPA. The Corps has primary responsibility for the permit program, issuance of 404 permits, and enforcement while EPA has oversight authority and an enforcement role for the 404 permit program. EPA also has veto authority over issuance of a permit by the Corps if it would have an "unacceptable adverse effect" on municipal water supplies, fish and wildlife resources, or recreational areas (Fennemore Craig 1992, citing 33 USC §1344(c)).

The federal and state wildlife agencies are given authority to review and comment on Section 404 permits through the Fish and Wildlife Coordination Act (16 USC 662) which requires consultation with USFWS and the state wildlife agency for federally funded or permitted projects that modify waters and may potentially have an impact on wildlife resources. The USFWS also has authority to elevate a decision (for review by a higher authority within the Corps), but otherwise, like the state wildlife agency, it only has authority to comment (Fennemore Craig 1992). Each of these agencies has mitigation policies for wildlife and wildlife habitat losses and a policy concerning riparian habitat.

The Section 404 permit program requires a permit for discharges within the ordinary high water (OHW) mark in freshwater areas, including intermittent or ephemeral streams, or the mean high water (MHW) mark in tidal areas. Delineation of OHW and MHW by the Corps establishes the jurisdictional boundaries within which an activity may require a Section 404 permit. Riparian areas that are outside of the ordinary high water mark and do not meet the wetlands criteria as defined in the 1987 Corps of Engineers Wetlands Delineation Manual are not protected by Section 404. Dredging activities within waters of the United States is regulated under Section 404.

According to a new ruling by the Corps (1993), a "grandfathered provision" states that Section 404 authorization will not be required for discharges of dredged material associated with ditching, channelization, or other excavation activities in waters of the United States, including wetlands, where such discharges were not previously regulated and where such activities had begun or were under contract to begin before August 25, 1993, and are completed before August 25, 1994. Additionally, this ruling clarifies that prior converted croplands are not waters of the United States and that a Section 404 permit is not required on these lands unless they are considered abandoned and subsequently develop the characteristics of a wetland.

#### Strengths

- Section 404 is the most comprehensive federal program that regulates activities harmful to wetlands.
- Section 404 permit program may be assumed by states and provides a model for state regulation.
- Advanced identification of sites suitable/unsuitable for Section 404 discharges may provide predictability and certainty in the permit process.
- Efforts to streamline the program by both the Corps and EPA have reduced the regulatory burden on individuals through general permits and exempt activities; other efforts are being initiated (WWF 1992, p. 77).
- Addresses dredging and filling activities in waters of the United States. In Arizona it focuses on watercourses and impoundments including ephemeral washes (typically those with a bottom width of 5 ft or more).
- Can provide protection for riparian areas located along perennial, intermittent, and ephemeral watercourses as long as these areas are within the Corp's jurisdictional areas and permit applications are submitted.
- Penalties for unauthorized activities which can range from \$25,000 to \$125,000.

#### Weaknesses

- The Corps' jurisdiction includes those activities within the ordinary high water of waters of the U.S. and often do not include riparian areas.
- Wetlands protection through Section 404 is limited to only those alterations resulting from the discharge of dredged or fill materials. The definition of "discharge of dredged material" does not include activities that cut or remove or vegetation above the ground (e.g., mowing,

rotary cutting, and chainsawing) where the activity neither substantially disturbs the root system nor involves mechanized pushing, dragging, or other similar activities that redeposit excavated soil material.

- Cumulative impacts are difficult to determine when permits are addressed one-by-one.
- The regulated community reports frustrations with the permit process--too cumbersome, too complicated, often inconsistently implemented within the Corps districts and between EPA and the Corps (Rich and Coltman 1991).
- Frustrations with the permit process tend to "encourage" the relocation of activities upslope, outside jurisdiction of the 404 permit often within riparian areas.
- A 1988 GAO report on Section 404 implementation concluded that the Corps does not usually seek out permit violators nor follow up on reports of possible violations.
- Effectiveness of the 404 program is not adequately known.
- Broad range of exempted activities (such as normal farming, draining, grazing, and logging) limits comprehensive protection of riparian areas through the Section 404 permit process.
- General permits, especially Nationwide Permit 26, wetland destruction may be allowed for sites under ten acres.
- Lack of monitoring projects prevents verification of success of restoration or creation projects.
- Lack of monitoring to determine if permit conditions have been met.
- The program for state water quality certification of Section 404 permits, under Section 401 of the Clean Water Act, must operate efficiently or the processing of Section 404 applications becomes bogged down.
- Section 404 mitigation requirements have been inconsistent and are not always clearly related to habitat impacts.
- Riparian areas are not specifically addressed.

### **Rivers and Harbors Act of 1899 - Section 10**

[Rank: High to moderate for activities typically requiring permit, to no protection]

Section 10 of the Rivers and Harbors Act of 1899, the oldest federal law affecting wetlands protection, is administered by the Corps. The purpose of the law is to preserve the navigability of the nation's waters by prohibiting the unauthorized obstruction or alteration of any navigable water of the United States. Such regulated actions include the excavation from, or deposition of materials within such waters, or the accomplishment of any other work that affects the course, location, condition, or capacity of such waters. Section 10 requires a permit for dredging or the placement

of fill or structures within traditionally navigable waters of the United States. In Arizona, Section 10 applies only to portions of the Colorado River. Section 10 only applies to navigable waters and therefore its scope is much narrower than that of Section 404, which applies to all waters of the U.S. regardless of their navigability.

#### Strength

- Dredging activities are regulated.

#### Weakness

- Applies only to portions of the Colorado River in Arizona.

#### **Wilderness Act of 1964**

[Rank: High to moderate, except for grazing which is low to no protection]

The Wilderness Preservation System Act authorizes Congress to designate large roadless and undeveloped federal lands for special protection as natural areas. AZ has nearly 4.5 million acres of "Wilderness" (6.2% of AZ). The Act provides that any area included in the wilderness system would continue to be operated by the same agency that administered it before wilderness designation. Wilderness areas provide greater protection of watersheds and water quality than they would have under general policies of land management agencies. Generally a wilderness area is undeveloped federal land in its natural state with no permanent improvements or human habitation.

Some commercial activities are permitted including: 1) possible continued use of motorboats and aircraft where such uses were already established; 2) fire, insect, and disease control measures; 3) mineral prospecting conducted "in a manner compatible with preservation of the wilderness environment"; 4) water project developments; 5) continued livestock grazing under permits issued prior to 1964, subject to reasonable regulation by the Secretary; and 6) commercial recreation activities. A wilderness area has outstanding opportunities for solitude and unconfined recreation. Generally an area must be 5,000 acres in size to preserve in an unimpaired condition and may be of specific ecological, educational, scenic, or historic value. A wilderness area is protected and managed to preserve its natural conditions.

#### Strengths

- Wilderness designation removes federal land from any mineral entry or patent (except for valid existing rights), and restricts all uses of the land to those uses that are compatible with wilderness and would not impair any wilderness values.
- At any time, federal land is subject to consideration by Congress for designation as "Wilderness".
- Allows some protection of wetlands and riparian areas within designated wilderness areas by preserving its "wilderness character," generally meaning maintaining its natural appearance and ecological health.

#### Weaknesses

- Impacts to riparian habitat resources may continue from activities that could damage riparian

areas are sometimes allowed to continue in "Wilderness Areas".

- No specific description of what constitutes the "natural appearance and ecological health" of a riverine/riparian system; therefore, managing agencies have much room for interpreting what is required to "preserve the wilderness character".
- No provision to restore damaged riparian areas from pre-designation activities.
- Arizona Desert Wilderness Act of 1990 on BLM land in Arizona in 1990 have very junior priorities for reserved water right.

### **National Wild & Scenic Rivers Act of 1968**

[Rank: High to moderate]

In 1968, Congress passed the National Wild and Scenic Rivers Act which allows rivers and river segments with outstanding scenic, recreational, geological, wildlife, historical, or cultural values to be protected in their free-flowing condition as part of the National Wild and Scenic Rivers System. ("Free-flowing" in this context means existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.) The different classifications of "wild", "scenic", or "recreational" refer to the degree of existing impediments of "free-flowing" and development along the river. "Wild" means that the river is generally "wilderness" in nature with no impoundments. "Scenic" means the river is largely primitive, but still free of impoundments. "Recreational" means the river may be heavily developed and may have some impoundments.

States can initiate designation of a river or river segments as wild and scenic. When designated, the protection of the river covers up to 1/4 mile on each side of the river. Limitations are placed on federal permits, licenses, funding or construction of other water resource projects having a "direct and adverse effect" on the environment. Restrictions can vary from absolute prohibition of any development to very limited development and use. Allowable activities include camping, swimming, nonmotorized boating, sport hunting, and sport and commercial fishing. In some areas certain new mining claims may be made.

In Arizona, only one segment of the Verde River has been officially designated as "Wild & Scenic"; however, the Arizona congressional delegation is presently studying designation of nearly 1700 miles of Arizona rivers as part of the Wild & Scenic River System.

#### Strengths

- The Act creates a federal reserved water right for a quantity of water sufficient to meet the purposes of the act on designated river segments. The water right would be junior to all valid and existing rights.
- Different classifications provide flexibility in addressing existing conditions of river-riparian area activities.
- Federal agencies must assure that the values for which the river was designated are protected.

- The Act may designate intermittent streams as wild and scenic.

#### Weaknesses

- Focus on "outstanding rivers" limits addressing many non-outstanding degraded river-riparian areas.
- No authority, standards, mechanisms or incentives to restore degraded riverine-riparian ecosystems.
- Arbitrarily designated corridors of 320-acres maximum per river mile may not include all ecologically important parts of the riparian ecosystem. Due to piecemeal protection, watersheds and river systems are not protected or restored.
- Rivers and riparian areas can be affected by activities outside the corridor, both upstream and in upland parts of watershed. Example: Operation of Alamo Dam on the Bill Williams River can effect downstream
- Broad management discretion provided to federal agencies in management of designated rivers results in inconsistencies among agencies.
- Protection of pre-existing rights requires federal managers to continue to permit ecologically damaging activities with grazing a particular concern on many western rivers-riparian areas.

#### **Endangered Species Act of 1973**

[Rank: High to moderate in areas where protected species are involved and an activity is proposed that could affect it, to low protection]

The Endangered Species Act (ESA) indirectly protects riparian areas through the protection of critical habitat of rare, threatened, or endangered species. An endangered species is "any species which is in danger of extinction throughout all or a significant portion of its range." A species is threatened if it is "likely to become an endangered species within the foreseeable future through all or a significant portion of its range." The U.S. Fish and Wildlife Service (FWS) takes jurisdiction over terrestrial and native freshwater species throughout Arizona. The ESA alone does not accomplish ecosystem management of federal riverine-riparian lands because it was not intended as a proactive land management statute. Rather it is a mechanism for federal intervention that is triggered only after severe ecosystem degradation has occurred resulting in the endangerment of one or more identified species.

Federal agencies must consult with the USFWS if any action they wholly or partially authorize, fund, or carry out may affect federally endangered or threatened species or may result in the destruction or modification of critical habitat for endangered or threatened species. Processing of permit applications by the Corps of Engineers under Section 404 of the Clean Water Act requires that provisions of Section 7 of ESA be addressed, regardless of land ownership. Projects that occur on state or private land are regulated if the action may "take" endangered or threatened animals. The term "take" broadly means to kill, harass, or harm a protected species. A permit must be obtained from the USFWS for any taking on state or public land.



Some wetlands and riparian area development may be restricted through protection of critical habitat. Critical habitat must be determined "on basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat". Rivers in Arizona designated as "critical habitat" are: portions of the Colorado, Verde River, Salt, and Gila Rivers, reaches of Aravaipa Creek, East Clear Creek, Chevelon Creek, Nutrioso Creek, the Little Colorado River, and several creeks in the White Mountains. Extensive reaches of the San Pedro, as well as more limited reaches of Wet Beaver Creek and West Clear Creek are being proposed for critical habitat designation.

#### Strengths

- Applies to Federal, State, and private lands.
- Allows for protection of critical habitat, which may include wetlands and riparian areas
- ESA unique among federal statutes in that it puts science first with implementation of the ESA clearly requiring a solid foundation of ecological knowledge.
- Statutory language and Congressional legislative intent clearly support the ESA prohibition against any governmental action that may jeopardize a "listed species" or adversely modify its "critical habitat".
- Policies enunciated by courts demonstrate substantial deference to ESA requirements (e.g., Carson-Truckee Water Conservancy District v. Clark (1984)).
- Caselaw indicates ESA does authorize diminution of existing water rights through regulation (e.g., United States v. Glenn-Colusa Irrigation District" (1992)).

#### Weaknesses

- ESA amended in 1978 by Congress provided narrow statutory definition of "critical habitat" and created a critical habitat designation process mandating identification of "primary constituent elements" of a critical habitat being listed with the critical habitat designation.
- ESA focuses more on individual species than on habitat and ecosystem protection. Agency regulatory interpretation has reduced dual mandate of protecting species or critical habitat into a single "no jeopardy of species" standard.
- Act is triggered only when a species has become endangered at which point ecosystem degradation has probably reached critical levels. Long delays in listing species and therefore delays in protecting associated habitat.
- The act is often administered with little local involvement, no serious local input, and little flexibility.
- ESA considered last ditch effort to save riverine-riparian species on the brink of extinction.

## **National Environmental Policy Act (NEPA)**

[Rank: Moderate to low protection]

The National Environmental Policy Act (NEPA) establishes a set of basic criteria and a process for predicting and disclosing the expected, adverse, incremental environmental effects of individual actions undertaken or funded by the federal government as well as assess "cumulative impacts" of past, present and reasonably foreseeable future actions. NEPA does not, in itself, set any standards for resource protection, but it requires that the potential effects of an action be reviewed in light of laws, regulations and policies that **do** set standards. A preliminary NEPA document, the Environmental Assessment (EA), will describe the proposed action, the existing environment, and any adverse changes that might be prohibited or regulated.

If a federally proposed or listed, threatened or endangered species will be adversely affected by the action, the EA must disclose the impact. The Endangered Species Act (ESA), **NOT NEPA**, requires that the agency performing the EA then propose an avoidance of the impact or an impact mitigation, which must be acceptable to the U.S. Fish and Wildlife Service (USFWS). When USFWS is convinced that the species will not be harmed, a Finding of No Significant Impact (FONSI) can be issued, and the action proceeds. However, it is possible that the impact will be of such a nature that it cannot be avoided or mitigated. The impact will then have to be quantified in an Environmental Impact Statement (EIS); the agency proposing the action will have to convince the USFWS that the impact is inevitable and tolerable under their responsibility to protect the species. NEPA is unable to further affect the process, or the decision to cancel or go ahead with the project.

For riparian areas, NEPA simply requires that the impacts of a proposed project be disclosed in advance so that affected agencies with some kind of riparian protection policy can assert their jurisdiction and take a position on their intended enforcement. For example a proposed action that would destroy habitat features required by the Southwestern Willow Flycatcher, a proposed threatened, "riparian obligate" bird species. Under the Endangered Species Act, the USFWS is required to make a determination whether the flycatcher is present in the area. If it is present, USFWS will carry out their ESA enforcement mandate by blocking the project. If the flycatcher is not present in the area, is never listed, or is delisted, the USFWS has no jurisdiction, and the riparian area is not protected. Adverse effects on candidate or unlisted species are not required to be mitigated, unless they somehow impact the flycatcher.

### Strengths

- Forces federal agencies to factor environmental impacts into their decision-making processes. These evaluations are subject to both public and judicial scrutiny.
- Direct, indirect and cumulative impact analyses require federal agencies to concern themselves with the activities of other public and private entities in the same watershed.
- 78% of Arizona's perennial rivers located on either Federal or Tribal Lands which require NEPA review for any activity.

### Weaknesses

- Only applies to federal or federally funded actions.

- NEPA is primarily a procedural statute which forces informed decision making, but does not compel particular outcomes.
- NEPA does not require that the final agency decision must avoid identified adverse environmental consequences.
- NEPA does not set any standards for environmental resource protection.
- No common or uniform goals or policies using the same ecological definitions for all federal agencies to use in planning and management oversight of watersheds or ecosystems.

### **BLM Management Plans**

[Rank: High to moderate for grazing and timber harvesting; moderate to low for sand and gravel, dredging and filling road construction, mining and recreation use]

Bureau of Land Management uses the Federal Land Policy Management Act (FLPMA) of 1976 to provide guidance for land use planning. FLPMA requires that the public lands be managed in a manner that will protect the quality of ecological, environmental, and water resources values, among others, including riparian areas. AGFD's (1993) report determined that 5.8%, or 289.07 miles of the state's perennial waters are located on BLM land. Planning documents prepared by the BLM include Resource Management Planning (RMP) is a comprehensive land use plan that, in broad terms, identifies the management actions for a specific area. An Activity Plan is a detailed plan to implement the more general RMP. Within the RMP are allowable land uses, levels of use, and management actions to be taken. Once a plan is adopted, all BLM resource decisions must conform to it. When a RMP is completed it provides a significant opportunity to protect critical riparian areas that occur on BLM lands. RMPs may be amended as necessary to reflect new issues and scientific data.

The land uses which present the most serious threats to riparian areas on BLM lands are: livestock grazing, water diversion and groundwater pumping. Other uses that may cause damage are: mining and mineral leasing, timber, road building, and intensive motorized recreation. Allotment Management Plans or AMPs are a type of Activity Plan that prescribes the manner and extent to which livestock grazing is conducted and managed in a geographic area to meet objectives as determined through the RMP. AMPs may establish grazing systems (e.g., no grazing, limited seasonal grazing, number of Animal Unit Month [AUM]) for specific areas, such as riparian areas.

BLM adopted a Riparian Area Management Policy on January 22, 1987 which is being incorporated into their management processes. BLM's Riparian Area Management Policy is provided in Appendix D.

### Strengths

- In 1987, BLM adopted a policy to protect and improve riparian areas.
- Through Activity Plans, management of riparian areas can have very specific restrictions and limitation imposed.

- RMPs and Activity Plans are evaluated to determine if they are meeting objectives. If not meeting objectives, management actions are revised.
- Designation of National Conservation Areas are intensely managed to preserve riparian resources.

#### Weaknesses

- Many allotments on BLM land in Arizona are lacking current AMPs or have never had AMPs initiated.
- Many AMPs require extensive monitoring of conditions on the ground to monitor effectiveness or justify management action. Adequate staffing is often not available to conduct this monitoring.
- Implementation of plans and policies are inconsistent between Arizona BLM Districts.
- Current BLM regulations do not specially protect riparian areas. New standards and guidelines are being developed that will help protect riparian areas.
- Funding not always available or adequate to implement some plans and policies.

#### **USFS Management Plans**

[Rank: High to moderate for grazing and timber harvesting; moderate to low for sand and gravel, dredging and filling road construction, mining and recreation use]

AGFD's (1993) report determined that 31.3%, or 1,573.50 miles of the state's perennial waters are located on Forest Service land. National Forest Management Act (NFMA) directs the US Forest Service to determine suitability and compatibility of land areas, maintenance of productivity and the need to protect and improve the quality of soil and water resources. Each individual forest unit develops Forest Plans to guide management of Forest resources which is revised every ten years, or as warranted by "significantly changed" conditions and are developed in accordance with NEPA's procedural requirements. In Arizona, there are six National Forests: Tonto, Prescott, Coronado, Apache-Sitgreaves, Coconino, and Kaibab. Forest Plans are completed for the six forests which provide standards and guidelines for riparian management.

The National Forests of the Southwestern Region, including the six forests in Arizona, use an Integrated Resource Management (IRM) process for designing and implementing Forest Plan actions. The major components of IRM are: 1) identification of proposed actions; 2) proposed action design; and 3) monitoring. This process provides for site specific refinement of Forest Plan goals based on local issues, such as riparian condition and public involvement. IRM facilitates compliance with the National Forest Management Act and the National Environmental Policy Act as well as with other environmental laws such as the Endangered Species Act, Clean Water Act and Clean Air Act.

A document written by Chief of the Forest Service in 1991 "Riparian Management: A Leadership Challenge" called for: 1) "increased agency efforts to adjust activities and uses affecting riparian areas to achieve, over a reasonable period of time, consistency with existing forest plan standards and guidelines"; 2) "strengthen and clarify forest plan standards, where needed, to protect

riparian areas and wetlands"; and 3) "implement regional riparian strategies and develop forest action plans that respond to the national strategy ".

Forest Service Manual has policy for riparian areas.

1) Manage riparian areas in relation to various legal mandates, including, but not limited to those associated with floodplains, wetlands, water quality, dredged and fill material, endangered species, wild and scenic rivers, and cultural resources.

2) Manage riparian areas under the principles of multiple-use and sustained-yield while emphasizing protection and improvement of soil, water, vegetation, and fish and wildlife resources. Give preferential consideration to riparian dependent resources when conflicts among land use activities occur.

3) Delineate and evaluate riparian areas prior to implementing any project activity. Determine geographic boundaries of riparian areas by onsite characteristics of water, soil, and vegetation.

4) Give attention to land along all stream channels capable of supporting riparian vegetation (36 CFR 219.27e).

5) Give special attention to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water. This distance shall correspond to at least the recognizable area dominated by the riparian vegetation (36 CFR 219.27e). Give special attention to adjacent terrestrial areas to assure adequate protection for the riparian dependent resources.

#### Strengths

- Forest Service Manual contains policy for riparian areas.
- NFMA requires forest managers to be guided by a 100-foot "riparian management zone" from edge of a water body, within which land uses may not degrade water quality or fish habitat. (36 CFR 219.27e)
- Recognition of problems and education and awareness approach.
- Specific action plans provide guidance and direction in forest plans "to sustain the health of riparian areas that are affected by mining, recreation, wildlife and domestic livestock, off-road vehicles, roads, and other activities." (excerpt from "Riparian Management: A Leadership Challenge", 1991).

#### Weaknesses

- NFMA provision that "serious and adverse" effects shall not be allowed to occur as a result of activities in riparian areas depends on Forest Service's interpretation of effects.
- NFMA is not powerful, no "teeth". Implementation varies by region, by forest, by ranger district, and by individual employee. Time, money and other resource constraints do not allow for a consistent approach.

#### **Bureau of Reclamation Wetlands/Riparian Policy**

[High to moderate for riparian habitat within authorized BOR project areas, to no protection]

As a Federal entity, the Bureau of Reclamation (BOR) ensures its activities incorporate requirements of applicable environmental laws and executive orders related to the protection and

enhancement of natural resources. In Arizona, BOR is involved in several water-related development and management projects, such as the Central Arizona Project, Safety of Dams work on the Salt and Verde Rivers, and Front Work and Levee System-related operation and maintenance activities on the Colorado River. Working with the Fish and Wildlife Coordination Act, BOR has opportunities for restoring and enhancing riparian and wetland habitat.

In 1987, BOR reassessed the direction of its programs, resulting in the recognition of the need for increased emphasis on improved management of projects and protection of environmental values. As a result, BOR has produced a Strategic Plan which provides a long-term frame work for water resources management, development and protection. Integral to this plan is the recognition that increased environmental knowledge and changing societal values have placed a greater emphasis on the protection of natural resources. Goals in the Strategic Plan call for an appropriate balance of all uses, including meeting water quality objectives, controlling point and nonpoint sources of pollution, providing for instream flow needs, and conserving and enhancing fish and wildlife habitat and resources. BOR is in the process of establishing an implementation plan for achieving the goals established under the "Wetlands and Riparian Habitat" element of the Strategic Plan. A draft of this implementation is currently being reviewed internally.

Examples of initiatives that were recently completed or are currently underway include Cook's Lake two miles north of the confluence of Aravaipa Creek and the San Pedro River, the Tonto Creek Riparian Unit, backwater restoration along Colorado River, Topock Marsh, and coordinated efforts on four refuges.

#### Strengths

- Facilitates coordination among many resource agencies in the development of fish and wildlife recommendations.
- Provides funding for mitigation (and enhancement, if authorized) as part of project implementation to construct the project.
- BOR is required to consider recommendations made by wildlife agencies concerning the project's wildlife aspects.

#### Weaknesses

- BOR has authority to decide which mitigation measures, if any, to incorporate into the project plan.
- BOR's ability to protect, restore, create or enhance wetland and riparian habitat is limited by the legislation authorizing a given project, and generally is restricted to minimizing/mitigating damage resulting from construction of a water resources project; it has no specific authority to create or enhance these habitats unless impacted by an authorized project.

#### **Clean Water Act Section 402 National Pollutant Discharge Elimination System (NPDES)**

The purpose of the National Pollutant Discharge Elimination System (NPDES) program is to protect surface waters by regulating discharges to navigable waters. The EPA administers the NPDES program. In Arizona, ADEQ processes applications and drafts permits for EPA for point

sources of pollution.

NPDES permits are required for effluent discharges from wastewater treatment facilities into waters of the United States. Many facilities will have to provide higher levels of treatment in order to comply with the applicable water quality standards, including the standards for toxics. Higher treatment costs associated with inappropriate beneficial use designations, their associated water quality criteria, and little or no dilution for the treated waste water may encourage dischargers to remove effluent from waters that currently support effluent-dependent aquatic and riparian ecosystems, with the consequent loss of those ecosystems. To address this issue, EPA Region 9 has developed Interim Final "Guidance for Modifying Water Quality Standards and Protecting Effluent-Dependent Ecosystems" (EPA 1992). This guidance clarifies the existing flexibility in the CWA and federal regulations that allows for the modification of designated uses and the water quality criteria and effluent limits associated with them.

NPDES permits are also required to control discharges of pollutants from storm water runoff. Municipal storm water permits must include a description of structural and source control measures that are to be implemented to reduce pollutants in runoff from commercial and residential area and from construction sites. Individual industrial storm water permits for construction activities require measures to control pollutants in storm water discharges during and after construction operations. General storm water permits for construction activities require best management practices that include sediment and erosion controls. Specific control measures and best management practices involving the preservation of natural vegetation or the establishment of buffer zones and filter strips can be designed to enhance riparian areas.

#### Strengths

- Permit limits for waste water discharges are designed to fully protect designated uses.
- Storm water permits can include control measures that enhance riparian resources.
- Considerable flexibility exists to address conflicts between water quality standards compliance and maintenance of waste water discharges that support ecologically valuable riparian habitat.
- Maintains the chemical integrity of watercourses.

#### Weaknesses

- The CWA cannot require the discharge of waste water to maintain riparian habitat.
- It is unclear to what extent specific BMPs and other control measures that enhance riparian can be required in storm water permits.
- Increasingly stringent NPDES permit requirements may cause the elimination of wastewater effluent discharges to waters of the U.S. that currently support riparian vegetation.
- Water that has been treated through a wastewater treatment plant is owned by that plant and the owner is not required to discharge water into stream; when this happens, no recharge occurs and water is 100 percent consumptive.
- NPDES requirements may provide economic disincentives for streambed discharge of effluent.

### **Emergency Wetlands Resources Act**

The Emergency Wetlands Conservation Act promotes the conservation of migratory waterfowl and the protection of wetlands and other essential habitat. It also promotes the importance of wetlands by authorizing available funds for their acquisition consistent with a national plan, the National Wetlands Priority Conservation Plan, established by the USFWS.

This act requires a number of actions that promote wetlands and require states to view wetlands as important:

- States must prepare a wetlands component in their Statewide Comprehensive Outdoor Recreation Plan (SCORP) that recognizes the recreational importance of wetlands and is consistent with the USFWS national plan
- Wetland inventory and mapping efforts must continue through the National Wetlands Inventory
- Congress must be periodically updated on the status, condition, and trends of wetlands, and the impact of federal programs on wetlands
- Fees may be collected at wildlife refuges for operational costs and funding of the Migratory Bird Conservation Fund

#### Strength

- Wetlands undergo scrutiny for values and priority for protection.

#### Weakness

- Riparian areas of the arid West are not explicitly addressed.

### **Federal Land Policy and Management Act of 1976**

Passage of the Federal Land Policy and Management Act of 1976 (FLPMA) gave the BLM its land management authority. Previously, the BLM served as the custodian of the public domain lands while administering their transfer into private and public ownership (Wellman 1987). (Public domain lands are the federal lands not designated for agriculture, forest, recreation, and other interests, and once were thought of as the land nobody wanted.) FLPMA required BLM to determine the wilderness potential of all roadless areas 5,000 acres in size or larger. Some riparian areas were included in BLM wilderness legislation in Arizona.

#### Strengths

- Recognized and authorized multiple-use management with emphasis on basic resources, wildlife habitat, and riparian areas.
- Directs management of riparian areas on BLM lands.

#### Weaknesses

- Provided only indirect guidance for riparian area management.
- "Multiple use" concept sometimes used as a license to overuse sensitive areas.
- FLPMA is unevenly applied throughout districts.



### **Federal Power Act (Federal Energy Regulatory Commission)**

Created by the Federal Power Act, the Federal Energy Regulation Commission (FERC) regulates the construction and operation of the majority of non-federal hydroelectric projects. FERC has the authority to license hydroelectric projects on the nation's navigable waters on public lands and reservations (its authority does not include national parks or national monuments) (the Pacific Rivers Council 1993, p. 194). In considering licensing, FERC "must balance the respective needs for power, energy alternatives, impacts to fish and wildlife and other national resources, the preservation of wild rivers and wilderness areas, the maintenance of natural beauty, and the preservation of historic sites" (The Pacific Rivers Council 1993, p. 195).

Of the two hydroelectric plants in Arizona, the Childs and Irving plants on Fossil Creek are currently up for relicensing by the FERC which must go through the federal environment impact assessment process. This provides an opportunity to review the need for continuing power generation from this source and to assess its ecological impacts.

#### Strength

- Licensing requirements provide an opportunity for reviewing the need for power and the respective ecological impacts of a hydroelectric project.

#### Weakness

- FERC rarely conditions or denies licenses for projects with significant adverse environmental impacts (The Pacific Rivers Council 1993, p. 196).

### **Federal Reserved Water Rights**

Federal reserved water rights is not a program. These water rights are the outcome of caselaw. These rights are described in this report to provide an understanding where these rights may come into play, such as with Indian Tribal Lands.

Federal reserved water rights were established in 1908 through the ruling of *Winters v. United States* (the "Winters Doctrine") where the U.S. Supreme Court ruled that inland reserved for the water of Indians was implicitly reserved as well (Weatherford and Brown 1986). These federal reserved rights "have been extended to national monuments, national parks, national wildlife refuges, stockwater ponds and springs" (The Pacific Rivers Council 1993, p. 229). Many wetland and riparian areas have water rights expressed or implied by federal legislation for the purpose of administering and monitoring federal lands such as national conservation areas, wildlife refuges, national parks and monuments, and wilderness areas. A 1976 U.S. Supreme Court decision (*Cappaert v. United States*) determined that federal reserved water rights to surface water deserved protection from hydrologically connected groundwater pumping which threatened a downstream national monument. Although not yet widely tested, this precedent may prove to be a strong tool in the protection of riparian/wetland areas with federal reserved water rights.

#### Strength

- Groundwater pumping in Arizona is not strongly regulated outside of Active Management Areas and threatens many of the state's riparian areas. In the absence of state recognition of a surface water/groundwater connection, the federal reserved water rights (combined with the Cappaert decision) provides significant protection to riparian/wetland resources.

#### Weakness

- Only affects waters with federal reserved water rights.
- Federal reserved water right in itself does not guarantee riparian protection.

### **Fish and Wildlife Coordination Act**

The Fish and Wildlife Coordination Act (16 USC 661) requires that wildlife resources be given consideration equal to that given other purposes of water resource development projects involving federal agencies. Under this act, the USFWS and the Department of Commerce's National Marine Fisheries Service (NMFS) are empowered to evaluate federal projects and federally-permitted projects for their impact on birds, fish, mammals, and all other classes of wild animals and all types of vegetation (land and aquatic) on which they depend. The Corps must therefore consult with the USFWS and NMFS concerning the impact of Section 404 permit activities on wildlife resources. Although their commenting roles are only advisory, these comments may be used as "the basis for modifying, conditioning, or denying a permit" (GAO 1988, p.10).

The act includes provision for management, for fish and wildlife purposes, of lands and waters associated with federal water related projects. Examples include creation of Havasu National Wildlife Refuge following construction of Parker Dam, creation of Imperial National Wildlife Refuge following construction of Imperial Dam, creation of Cibola National Wildlife Refuge following channelization of a portion of the Colorado River, and creation of the Alamo Wildlife Area, managed by Arizona Game and Fish Department, following construction of Alamo Dam.

#### Strength

- Federal and state wildlife agencies can recommend specific mitigation conditions for actions affecting wetlands or riparian areas.

#### Weakness

- The role of federal and state wildlife agencies is only advisory and their recommendations may not be incorporated in to the permit conditions or followed.

### **National Flood Insurance Program**

The 1968 National Flood Insurance Law (42 USC 4001-4128) established a federally subsidized flood insurance program for residents of communities which elect to participate in the program (Steiner et al. 1991a). Known as the National Flood Insurance Program (NFIP), it is administered by the Federal Emergency Management Agency (FEMA) and requires participating communities to adopt floodplain management regulations for flood hazard areas in order to qualify for federally supported flood insurance. Floodplain maps established by FEMA constitute the basis for floodplain management and the cost of any associated flood insurance. The NFIP has both positive as well as detrimental impacts on wetlands and riparian areas. The NFIP can be beneficial to wetlands through its designation of floodways along rivers and streams, which severely restricts any development within that area. Additionally, it encourages communities to protect open space and limit floodplain development by offering advantageous flood insurance rates for communities that exceed minimum standards (WWF 1992, p.107). On the other hand, NFIP allows development in floodplains and subsidizes premiums for those who do purchase flood insurance. Development in these areas can have a negative impact on associated wetlands and riparian areas.

Under the NFIP, participating communities must regulate all new construction and substantial improvements and development within floodprone areas. Development is also restricted within the designated floodways, resulting in protection of wetlands along rivers. According to the WWF (1992), an estimated five million acres of floodways have been designated along 40,000 stream and river miles, some of which with more stringent requirements than those established by FEMA.

#### Strengths

- Communities must restrict development within floodways which helps protect wetlands along rivers.
- Some floodplain management programs recognize the importance of wetlands in reducing peak flows within floodplains and therefore are sensitive to wetlands protection in their management programs (WWF 1993).

#### Weaknesses

- Channelization to reduce flood stage in areas adjacent to streams can be followed by a lessening of restrictions on development and requirements for flood insurance under this program. Therefore, while some riparian protection benefits may accrue from the program, riparian protection is not the intent and natural habitats may be impacted as a result of the program.
- By state statute, floodplain management ordinances do not apply to agriculture, mining or certain types of utilities and public works projects.

### **Surface Mining Control and Reclamation Act of 1977**

Surface mining operations can result in disturbances to the environment that can adversely affect commerce and the public welfare by contributing to floods, polluting the water, and destroying fish and wildlife habitats. The Surface Mining Control and Reclamation Act addresses the adverse environmental impacts of coal mining operations on public and private lands. Additionally, this act may designate certain federal lands as unsuitable for mining and also prohibits mining on certain sensitive federal lands (The Pacific Rivers Council 1993).

This act only applies to coal mining and related facilities. Therefore SMCRA has limited applicability in Arizona pertaining only to facilities which occur on the Navajo reservation. Specific requirements for these operations are:

1. Meet the approximate original contour (backfilling and grading to the approximate original contour)
2. Revegetate to a statistically equivalent community to what existed prior (must consider species composition, diversity and percent cover)
3. Maintain hydrologic conditions to support an alluvial valley floor (an alluvial valley floor is a sub-irrigated area along a streambed that could support the growth of grains which could provide winter feed for a rancher's cattle)

#### Strengths

- Provisions for recreation of landscape and vegetation.

- Provisions for maintaining hydrologic conditions supporting certain farming and ranching practices.

#### Weakness

- Only applies to general impacts of coal mining on vegetation, so specific impacts on riparian areas are not addressed.

#### **Coastal Zone Management Act of 1972 - NOT APPLIED TO ARIZONA**

Although the CZMA does not impact inland states like Arizona, it has significant national implications for wetlands and riparian areas. Coastal states may voluntarily participate in the Coastal Zone Management (CZM) program by preparing comprehensive plans which must meet minimum standards for federal approval and may be more stringent than the federal standards (Steiner et al. 1991a; WWF 1992). "For federal approval, state plans must demonstrate that they provide enforceable standards for the protection of specific coastal resources, including tidal and coastal nontidal wetlands" (WWF 1992, p. 87). The act also requires that federal activities be consistent with these state coastal zone management plans.

Under federal "consistency" requirements, applicants for Section 404 permits (or other federal licenses or permits) for actions within the coastal zone of a state with an approved CZM plan must demonstrate consistency with the state plan. States may object to a Section 404 permit if it is not consistent with their federally approved CZM plan, which precludes the Corps from issuing the permit (Steiner et al. 1991a; WWF 1992). Additionally, all approved CZM programs require state or local approval for wetlands alterations. In some states mitigation is required.

Federal "enhancement grants" are available on a competitive basis to encourage states to continually improve their programs. Additionally, policy guidance and technical assistance is available to states to establish, implement, and improve their CZM programs.

#### Strengths

- States may have broader regulations and areas regulated than through federal regulations such as the 404 program.
- States have some control over federal actions by requiring their consistency with state plans.
- This act focuses protection on coastal areas that are often most threatened by development.
- Provides a comprehensive approach to wetlands protection in coastal areas.
- CZM program has received fairly consistent funding.
- States have flexibility in designing program to meet particular needs.
- Good starting point for developing a comprehensive statewide wetlands protection program.
- Enhancement grants are available for increased protection and as another funding source (WWF 1992, p. 88).

#### Weaknesses

- State resources and commitment are required.
- Since only coastal wetlands are considered, may not work well into a statewide wetlands strategy and does not apply (except as a model) to inland states.
- Because of the flexibility of designing state programs, within certain federal guidelines, the extent of wetlands protection may vary by state .

**U.S. Environmental Protection Agency Watershed Protection Initiative - NOT APPLIED TO ARIZONA**

A few states have enacted programs that protect unique natural resources, including wetlands, in defined geographical areas or on a regional basis. Such regional approaches are receiving growing attention, however, Arizona has not enacted this program. EPA has launched a watershed protection initiative where watershed protection is a priority, specifically for funding under many of EPA's CWA grant programs. (EPA 1991). Watersheds are distinct geographic areas where water, sediments, and dissolved materials drain to a common outlet -- such as a point on a larger stream, a lake, an underlying aquifer, and estuary, or an ocean (EPA 1991b). The goal of the watershed initiative is to reduce ecological and human health risks in critical watersheds. This will be accomplished through:

- The identification of watersheds, by EPA regions and states, based on problems with available solutions;
- The aggressive implementation of controls;
- The development of scientifically valid, practical indicators to identify and assess improvements made and/or ecological risks that threaten water; and
- The development of ecological criteria that states can use in adopting standards for ecologically based pollution prevention and control programs (EPA 1991; Steiner et al. 1991a, pp. 28-29).

**Strength**

- Potentially a comprehensive and holistic approach.

**Weakness**

- It is a new initiative so its effectiveness has yet to be proven.

## STATE PROGRAMS

### **Clean Water Act (CWA) Section 401 Water Certification Program**

[Rank: High to moderate for applicable activities]

ADEQ has the authority to approve, approve with conditions, or deny federal licenses or permits where the proposed activity may cause discharges to waters of the United States within Arizona. Federal permits and licenses include: NPDES (CWA Section 402), CWA Section 404 (both Nationwide and Individual permits), Section 10 of the Rivers and Harbors Act, and hydroelectric licenses. All potential effects of a proposed activity on water quality, whether they be direct and indirect, short and long term, upstream and downstream, construction and operation, are a part of the state certification review. If the state denies certification, then the federal permitting agency or licensing agency is prohibited from issuing its permit or license. Neither the Corps nor the federal courts can review the state's certification decision; judicial review is in the state courts.

Congress, through the CWA Section 401(d), has authorized states to place any necessary conditions on Section 401 certification to ensure that a proposed project will comply with effluent limitations, water quality standards, pretreatment standards, provisions within state laws which are more rigorous than the federal regulations, and any other appropriate requirements of state law. Essentially, states are authorized to impose any conditions necessary for compliance with state water quality requirements. Also, because the state's certification of a construction permit or license is used as certification for an operating permit, it is imperative for a state review to consider all potential water quality impacts of the project (direct, indirect, and cumulative) during construction and over the life of the project (U.S. Environmental Protection Agency 1989).

#### Strengths

- ADEQ can deny 401 certification and the Corps cannot issue 404 permit.
- Nonpoint source pollution and other water quality requirements of state law are considered in certification.
- Water quality standards are an important regulatory tool for implementation of 401 certifications.
- A State may impose conditions on certifications insofar as necessary to enforce a designated use contained in the State's water quality standard. U.S. Supreme Court recently held that State of Washington's minimum stream flow requirement is a permissible condition of a Section 401 certification.
- States have a strong role through denial of certification which prevents the issuance of a permit or license.

#### Weaknesses

- Applicable only if activity occurs within ordinary high mark of Waters of the United States or delineated wetland jurisdictional boundaries. Riparian areas may extend beyond these boundaries.

- Only those activities requiring a federal permit or license are regulated (drainage and groundwater pumping have adverse impacts on wetlands and riparian areas but do not require federal licenses or permits).
- Section 401 water quality certification may be waived due to limited resources to fully review impacts
- Limited funding to adequately process 401 certifications can cause significant delays in obtaining a complete Section 404 permit.
- Emphasis on permitting processes which are by nature reactive rather than proactive.

### **Nonpoint Source Water Quality Management Program**

[Rank: Incidental to no protection for all activities]

In 1987, the Arizona Department of Environmental Quality developed the Nonpoint Source (NPS) Water Quality Management Program to meet the requirements of Section 319(a) and (b) of the Clean Water Act. Section 319 addresses surface water quality. Approved by the Environmental Protection Agency, the NPS Management Program assessed the nature and extent of nonpoint source pollution in the State and detailed the actions proposed by the State to manage the identified nonpoint source problems. Implementation of the NPS Water Quality Management Program is based on land use categories such as: agriculture (e.g., rangeland activities and irrigated croplands); hydrologic/habitat modification (e.g., channelization, vegetation manipulation); and resource extraction (e.g. sand and gravel mining). The Department is, however, committed to implement the Management Program on a watershed basis wherever possible. Elements within the NPS Management Program include planning, implementation by rule, implementation by other means, and compliance/enforcement.

ADEQ was directed in ARS §49-203.A.3 to adopt by rule a nonpoint source program. ADEQ is in the process of identifying those practices and measures which can be used to reduce pollutant impacts such as sediment, and nitrogen from respective identified NPS categories through the development of Best Management Practices (BMPs). Minimization and limitation of pollutant discharges into Navigable Waters and compliance with State Water Quality Standards are the primary objectives of the NPS Best Management Practices (BMP) Program. BMPs have been and will be developed for each NPS category. ARS §49-247 required ADEQ to adopt BMPs for Regulated Agricultural Activities (nitrogen fertilizer application and concentrated animal feeding operations) in rule. These activities are subject to general aquifer protection permit rules. BMPs are currently being developed for rangeland activities, sand and gravel mining, and urban runoff.

#### Strengths

- BMPs are developed by advisory groups which are comprised of land management agencies, affected entities, academia, private citizens and concerned interest groups. The affected industry is a part of program development.
- Tremendous flexibility is provided through BMPs which are written as broad goal statements that are applied statewide. Guidance manuals are developed to provide a "menu" of technologies to achieve BMPs. These manuals can be modified without having to go through rulemaking.

- Future rule making will address those categories that impact surface water (e.g., grazing, sand and gravel mining, urban runoff) that are not covered in the current agriculture BMP rules and permit system.

#### Weaknesses

- BMPs for nonpoint source categories, except nitrogen fertilizers and concentrated animal feeding operations, are not a part of terms and conditions of a permit and therefore not enforceable.
- BMPs are category or activity specific not area specific. BMPs do not address activities that occur in riparian areas at the present time.
- BMPs address water quality only and do not directly protect other functions of riparian areas (e.g. flood flow attenuation, wildlife habitat, etc.).

#### **Surface Water Quality Standards**

[Rank: High when applied to a particular activity if a permit required or compliance action, to no protection]

Standards are either numeric or narrative criteria against which water quality conditions at a given site can be compared. Numeric criteria are levels set in terms of a concentration of a material in a given amount of water. The amount varies according to the toxic (harmful) impact of the parameter (material being measured). More toxic materials have lower allowable limits. Areas with impacted waters (areas with existing standards violation problems), can cause the criteria of Total Maximum Daily Loads (TMDLs) to come into play. Usually, TMDLs are the total allowable quantities of material(s) which can be found in a given river segment. TMDLs are only beginning to be used as a tool in the process of protecting water quality (e.g. along Oak Creek and tentatively set for the Lower Colorado).

Certain water quality criteria are applicable to all waters of the state. Other criteria are assigned to specific surface water segments, including lakes, rivers, streams, or parts of these water bodies. These criteria are based on established use categories, or "Designated Uses", as follows:

Domestic Water Source (DWS)

Full Body Contact (FBC)

Incidental Human Contact (IHC)

Aquatic and Wildlife (A&W)

Cold-water fishery (A&Wc), Warm-water fishery (A&Ww), Ephemeral (A&We), and Effluent dominated water (A&Wedw).

Agricultural Irrigation (AGI)

Agricultural Livestock Watering (AGL)

Arizona Administrative Code (A.A.C.) Title 18, Chapter 11 establishes rules concerning Water Quality Boundaries and Standards (R18-11-101 through R-11-304) for surface water. These rules include: antidegradation, narrative standards; numeric standards for toxic substances, radiochemicals, and nutrients; designated streams uses; Unique Water and Effluent Dominated Waters (EDW) classifications and standards: and other specific limitations and exceptions.



### Strengths

- Surface Water Quality Standards protect portions of riparian areas from chemical contamination.
- Permits and certifications utilize surface water quality standards as part of Terms and Conditions for activity.
- Protection for riparian areas using water quality standards can be applied indirectly through the Section 401 State Water Quality Certification by preventing or minimizing damaging contamination by human activities. (See Clean Water Act Section 401)
- Monitoring involved in the process provides the basic data in understanding changes in water quality and provides a means for: investigation of complaints, reconnaissance, runoff events, special studies for enforcement cases and remedial programs, methodology development, and standards development.
- The potential threat of legal actions provides a deterrent factor to those who might otherwise act in a manner that would pollute waters of the United States. Activities such as clearing and construction within riparian areas must not violate water quality standards and pollute waters of the United States.
- National Pollution Discharge Elimination System (NPDES) permits must comply with all applicable state laws and rules including state water quality standards. In Arizona, EPA maintains authority over NPDES permits, and ADEQ reviews and certifies draft permits. Compliance actions can be initiated or referred by ADEQ, enforcement of permit conditions is EPA's responsibility.
- ADEQ recommends Best Management Practices to minimize nonpoint source pollution in its review of projects and permits for various activities.

### Weaknesses

- Eliminating plants along streambanks, reducing water temperatures, or removing all of the water from the stream are not prohibited. Such activities affect the protection and propagation of wildlife and aquatic life which are provided designated uses in the water quality standards.
- Protection of water quality does not necessarily mean protection of riparian areas. Riparian areas can be removed or cleared for other activities without directly affecting water quality. However, the long term effects of removal of riparian areas may indeed be a decline in water quality.
- There are many scientific unknowns in establishing "ambient" or "background" conditions. Individual stream system variability as well as natural fluctuations in levels of certain parameters (e.g. seasonal, annual, event specific conditions) make it difficult to set standards which are applicable across an area as large as Arizona.
- Many impacts to riparian habitats, e.g. wildlife, are either poorly or not addressed in water quality standards.

## Unique Waters

The Unique Waters classification allows for special protection of waters which meet the established criteria. This classification can provide additional protection of water quality by imposing standards that are more stringent than the use-based standards. To be classified as an Unique Water, the water body must first be nominated, either by the Director of DEQ or an outside group, agency, or individual. At least three of the ten requirements must be met for eligibility. These requirements are based on the value of the water body for recreation, education, fish and wildlife habitat, scientific study, or exceptional water quality. A water body may also qualify if it provides a habitat for a species on the "List of Threatened and Unique Wildlife of Arizona", and if it is essential to the maintenance and propagation of the species. The nominating entity must be able to demonstrate that the water body is capable of being managed as an Unique Water.

### Strength

- Provides general protection for surface water quality.

### Weaknesses

- Water body must be capable of being managed as an unique water hampers nomination of certain otherwise deserving segments that have existing problems. Lack of manageability eliminates many water body segments that could benefit from additional protection.
- Enforcement of unique waters is lacking.

## Arizona Native Plant Law

[Rank: Low to no protection]

The Arizona Native Plant Law (ANPL) has been in force since 1929, and applies equally to private, federal and state lands. For riparian protection, the ANPL specifies mesquite, palo verde, and ironwood as "protected" species. In addition the law cites other plant families. It is illegal to remove, destroy or mutilate protected native plants without a permit. The consequence of breaking the ANPL ranges from fines to jail sentences where each individual plant constitutes a separate offense.

A private landowner is not prohibited from disturbing any protected native plants on his property; however, the law requires that the land owner must notify the AZ Dept. of Agriculture (ADA) prior to any disturbance. If the area to be disturbed is less than one acre the landowner may simply call or write to the ADA. Landowners planning to disturb 1-acre, or more, that contain protected species are required to submit written notification at least 30-days in advance of any land disturbance activities.

### Strengths

- ADA is mandated to work with landowner to conserve and protect the protected native plants.
- Private lands greater than 40-acres require at least 60-day notice being provided to ADA.

- State and federal land activities affecting "native protected species" requires at least a 120-day notice irrespective of the acreage being disturbed.
- Cities and counties can enact ordinances, or zoning regulations, that specify that native plants, including riparian species, shall be retained in their natural setting and shall be free of damage. For example, The City of Scottsdale has enacted an ordinance (Sec. 7.5) protecting species with diameters greater than 4-inches with a maximum fine of \$10,000 per plant. Only the Development Board may authorize any removal of plants.

#### Weaknesses

- Riparian areas are not protected from land disturbances when there are no "protected native plants" within the riparian area.
- Areas less than 1-acre only require a telephone call or a written notice to ADA that an area with protected species is to be disturbed. There is no minimum ADA notification period required of the landowner.
- Insufficient resources for ADA to respond to all "protected native plants" disturbance notifications.
- Protection or restrictions on use of vegetation is restricted to a specific list of species. The list does not include important riparian woodland species such as Fremont cottonwood, Goodding willow or sycamore. Riparian plants are not protected from land disturbance even when there are native plants within the area.

#### **Arizona State Land Department Riparian Ecosystem Strategic Plan 1989**

The ASLD is responsible for managing the state trust land to produce the greatest short-term and long-term revenue for the trust beneficiaries (e.g., school system). In doing so, it must also consider the protection of these resources for the long-term benefit of the trust.

The 1989 Riparian Plan has been integrated into the Agency Strategic Plan. The department's strategic plan recognizes the importance of riparian areas. The riparian ecosystem strategic plan provides strategies for the protection and enhancement of riparian areas, while also encouraging consideration of riparian management in all ASLD actions and decisions. ASLD also coordinates with the government agencies that apply for leases that may affect riparian areas.

#### Strength

- The agency has the authorities necessary to control the activities that impact the Trust land riparian resources.

#### Weakness

- The agency no longer has the authority to exchange trust land having high environmental resource values with agencies that have missions more compatible with riparian preservation. Exchange was a key strategy in the riparian plan. A state constitutional amendment is necessary to regain the exchange authority.

## **Groundwater Management Act (1980)**

[Rank: Moderate (development) to low (effluent discharge)]

In June of 1980, the Arizona Legislature passed the Groundwater Management Act (GMA) to primarily stop long-term groundwater withdrawals that exceeded natural replenishment of groundwater supplies within four critical areas of Arizona. Since 1980, the GMA has been amended several times to provide additional ways to manage water supplies. The GMA established three levels of water management for different groundwater conditions found statewide; however, none of the GMA provisions mandate riparian area protection or restoration.

The most general statewide management level provisions include "reasonable use" of groundwater, groundwater basin designations, restrictions on transporting groundwater from one area to another, mandatory well registration, and requiring land developers to evaluate and report water availability. The second level of groundwater management are "irrigation non-expansion areas" (INAs) that restrict irrigation to lands that were irrigated in the five-year period prior to designation as an INA. There are currently three INAs in Arizona.

The most restrictive level of groundwater management occurs in "active management areas" (AMAs) where groundwater overdraft is most severe. There are four AMAs: Phoenix, Pinal, Tucson and Prescott. AMAs strive to achieve "safe-yield" (i.e., long-term balance between the annual amount of groundwater withdrawal and the amount naturally and artificially recharged) by the year 2025. In the agricultural Pinal AMA, the goal is to extend the life of the agricultural economy for as long as feasible, while preserving sufficient water supplies for future non-irrigation uses. All AMAs will require a progressive reduction in the volume of groundwater withdrawal.

### Strengths

- Prohibits the development of new acreage for agricultural use in AMAs and INAs.
- Groundwater use in AMAs monitored and usage progressively reduced over time.
- Recent "artificial recharge" of aquifer legislation include "underground storage and recovery" (US&R) options for (a) national monument/park instream, or (b) natural channel transportation to a constructed recharge facility. Both these options, can assist in maintaining, if not restoring, riparian communities along channel areas.

### Weaknesses

- Groundwater and surface water governed by separate law.
- The GMA promotes the use of effluent for municipal and industrial uses. Much of this effluent is currently discharged to natural stream channels and supports substantial riparian communities.
- Outside AMAs groundwater use is not managed or monitored.
- Groundwater pumping from aquifers that directly support ecosystems or are hydraulically connected to water systems that support these ecosystems may eventually degrade or destroy riparian communities.

- No mandate in GMA to preserve, protect or restore riparian areas.
- Artificial recharge options do not provide "storage credits" for water supplied by a project that is used to support riparian vegetation.

### **Groundwater Basin Transfer Law**

[Rank: High (groundwater pumping)]

The most recent amendment to the Groundwater Transportation Act of 1991 restricts the transportation of groundwater from all groundwater basins located outside AMAs to other groundwater basins unless explicitly allowed.

#### Strength

- Except for existing transfer activities, interbasin transfers are no longer allowed.

#### Weakness

- Does not specifically consider or address riparian community protection.

### **Groundwater Recharge Program**

Underground, Storage and Recovery (US&R) projects require two permits. The first permit allows the recharge of water, while the second allows recovery of the stored water. A US&R permit holder earns credits for all or a portion of the water stored. The amount of credits earned is based on statutory requirements and hydrologic measurements and calculations. With this program, (1) effluent may be passively recharged in a natural stream channel and recharged credits accrued to the permittee if, as a result of the managed recharge activity, the value of a state park or national park or monument is increased, or (2) water may be passively recharged in a natural channel without construction of a recharge facility, however, the permittee for this type of project would receive credit for only 50% of the total recharged water.

#### Strength

- Encourages the continued release of effluent to natural stream channels.

#### Weaknesses

- No guarantee effluent releases will continue. With 50% credit program a maintenance of a minimum baseflow is not required.
- The parks/monument recharge statute was written so specifically that it has little applicability to any other areas except on the Santa Cruz north of Nogales.

### **Effluent Regulation**

ADWR does not have comprehensive authority over effluent. However, some agency authority exists where it has been designated in the Groundwater Code and the Underground Water Storage Law by the legislature. Management and use of this type of water are greatly impacted by

water quality laws.

Strength

- see Recharge program

Weaknesses

- Water conservation measures of Groundwater Code aimed at conserving water for commercial, industrial and residential purposes, not riparian ecosystems.

**General Surface Water Rights**

[Rank: Moderate (surface water diversions and water release patterns) to no (effluent discharge)]

Three distinct categories of water; surface water, groundwater, and effluent are recognized in Arizona water law. Effluent is legally recognized as a third type of water; however, effluent is greatly impacted by water quality laws rather than the Surface Water Code or Groundwater Code.

The right to use surface water in Arizona is subject to the "doctrine of prior appropriation". Based on the tenet "first-in-time, first-in-right", appropriated water must be beneficially used, and the water right associated with the beneficial use is attached to the place of use.

"Beneficial use" generally means water for domestic, municipal, irrigation, stockwatering, electric power generation, recreation, wildlife including fish, artificial groundwater recharge, or mining purposes. By law surface water use for riparian vegetation is not considered a beneficial use, however, it may be included in an appropriation to support wildlife species habitat or recreational use needs.

Rights to surface water may be asserted under one of three legal bases: (1) rights perfected under territorial and state surface water laws and customs, or associated with land grants, (2) rights confirmed under a court decree, and (3) rights claimed under federal law.

Strength

- Water right process provides indirect protection when senior water rights diversions with the earliest priority are located at the end of a drainage (e.g. Verde River - SRVWUA).

Weaknesses

- Riparian habitat is not legally recognized as a beneficial use.
- ADWR lacks current surface water enforcement authority.
- Interactions between hydraulically connected surface water and groundwater systems are not legally recognized.

## **Instream Flow Rights**

[Rank: Moderate (surface water diversions)]

In the past, water had to be diverted and put to "beneficial use" away from the stream channel. However, because some beneficial uses of water can occur in a stream channel, ADWR now grants non-diversionary, instream uses for fish, wildlife and recreation appropriations. Several permits to appropriate instream flow (ISF) water rights have been issued.

### Strengths

- Provides protection from new, upstream appropriations and changes in points of diversion of existing water rights.
- Provides potential legal avenue for future groundwater/surface water interaction determinations.

### Weaknesses

- Are junior to most other surface water rights. Therefore, during drought periods, streamflow may not be available for an ISF right once upstream, senior water rights are satisfied.
- Severing an existing water right that is used for a purpose that requires diverting the water from a streambed to an Instream Flow Right is available only to the state or one of its political subdivisions.
- Holder of a diversionary water right cannot simply cease diversions to create an Instream Flow Right. To ensure that an existing diversionary right does not become subject to abandonment or forfeiture, beneficial use of the right must continue.
- Only three (3) certified Instream Flow Rights to date.

## **Adjudication of Water Rights**

[Rank: Moderate (groundwater pumping and surface water diversions)]

Two general adjudications are currently in process to establish the "extent and priority of the rights of all persons to use water" from two major Arizona river systems, the Gila and Little Colorado.

Among issues currently being addressed in the process is to determine when hydraulically connected waters should be classified as surface water or groundwater.

### Strengths

- Process includes inventory of riparian communities to determine acreage associated with each habitat type. In addition, water use associated with riparian vegetation and other water uses is evaluated in a water budget to assess total water available and used on a watershed basis.
- Result of groundwater/surface water interaction determinations: Some current "groundwater" withdrawals may be reclassified as appropriable subflow and would be subject to the state water right allocation process.

- If a stream is determined to be over-allocated more flow may be available, particularly if higher priority senior rights are located downstream.

#### Weaknesses

- Riparian vegetation not recognized as beneficial use. (See Surface Water Law section)
- Process is slow. No watershed has completed the adjudication process, therefore most diversions are not monitored or regulated.

#### **Water Right Sever & Transfer**

[Rank: Moderate (surface water diversions)]

Severing an existing diversionary water right to an Instream Flow (ISF) right for wildlife, including fish, and recreational purposes is available only to the state or one of its political subdivisions. Finally, the holder of a diversionary water right cannot simply cease diversions to create an ISF; otherwise, the existing (original) diversionary water right becomes subject to abandonment or forfeiture -- beneficial use of the right must continue. The end result is continued reduction of streamflow with ultimate reduction in available water for riparian habitat.

#### Strength

- Can be used to convert an existing diversionary right to an ISF right.

#### Weakness

- Conversion of a diversionary right to a right for fish, wildlife or recreation use is limited to the state or its political subdivisions. Irrigation districts may veto conversions that are proposed within their service area boundaries or are proposed in watersheds that supply their irrigation water supplies.

#### **Executive Order 91-6**

Signed by Governor Rose Mofford on February 14, 1991, Executive Order 91-6 established an eleven-member interagency Riparian Areas Coordinating Council (RACC) comprised of representatives from various state agencies including the Commission on the Arizona Environment, ADEQ, AGFD, Arizona State Parks Board (ASPB), ADWR, Arizona Geological Society, Office of Tourism, ASLD, ADOT, Arizona Department of Agriculture (ADA), and Arizona Department of Commerce. (The RACC replaced the GRHTF organization created under Executive Order 89-16.) This executive order directed all state agencies to rigorously enforce their existing authority to assure riparian protection, maintenance, and restoration. It also recognized the critical nature of riparian areas to the State of Arizona and established the following policy (as based upon recommendations from Executive Order 89-16):

- a) To recognize that the protection and restoration of riparian areas are of critical importance to the state;
- b) To actively encourage and develop management practices that will result in the maintenance of existing riparian areas and restoration of degraded riparian areas;



- c) To promote public awareness through the development of educational programs of the benefits and values of riparian areas and the need for their protection and careful management;
- d) To seek and support cooperative efforts and local group and citizen involvement in the protection, maintenance, and restoration of riparian areas;
- e) To actively encourage the preservation, maintenance, and restoration of instream flows throughout the state;
- f) That any loss or degradation of riparian areas will be balanced by restoration or enhancement of other riparian areas of equal values and functions.

Certain agencies were charged with particular responsibilities. In particular, AGFD was mandated to conduct a statewide inventory and classification of riparian areas and coordinate the development of a riparian management plan for submittal to RACC; ADEQ was directed to coordinate the development of state legislation mandating riparian area protection and Section 401 responsibilities; and ADWR was charged with developing legislation to protect instream flows, among other responsibilities.

#### Strengths

- State leadership.
- Riparian areas of Arizona are explicitly addressed.

#### Weaknesses

- Did not result in specific riparian area protection requirements.
- Only those agencies directly under the Governor's supervision would be effected.
- Not considered adequate justification for state funding.

## LOCAL PROGRAMS

### Flood Plain Ordinances (delineated flood plains)

[Rank: low to none except for mining and metallurgical operations]

The primary focus of local floodplain ordinances are on flood-flow conveyance and protection of upstream and downstream property owners. ARS §48-3603, 48-3609, and 48-3610 direct that in order to be eligible for disaster relief each county flood control district or other appropriate public agencies adopt and enforce floodplain regulations. Where floodplains are delineated, the regulations are to include "all development of land, construction of residential, commercial or industrial structures *or uses of any kind* (emphasis added) which may divert, retard or obstruct floodwater and threaten public health or safety or the general welfare (ARS §48-3609.B.1)."

#### Strengths

- Channel alterations in a designated floodway or floodplain may be regulated by local floodplain managers if the project diverts, retards or obstructs surface flow and creates a hazard to life or property. Therefore, incidental protection of riparian habitat may be provided, if the habitat is located in a designated floodway/floodplain.
- Local floodplain managers also have the ability to regulate the location of solid waste landfills. For example, the Flood Control District of Maricopa County does not allow waste disposal systems, including landfills, to be located wholly or partially within a designated Floodway District.

#### Weaknesses

- Many watercourses in Arizona do not have floodplain and/or floodway designations, and few agencies have sufficient financial resources available to fund new floodplain studies. Since most local floodplain ordinances focus on flood-flow conveyance, clearing or excavation would not typically be regulated, even if the activity were to occur in a delineated floodplain.
- An individual or company that wishes to remove riparian vegetation from a delineated floodway or floodplain would not, in most instances, be required to obtain a Floodplain Use Permit. The interested party would be given a simple clearance to perform the activity, since the activity would not "divert, retard or obstruct floodwater."
- It is possible that a plan to restore riparian vegetation, especially in a regulated floodway, could be denied a Floodplain Use Permit. This would be due to the potential for the reestablished vegetation to "divert, retard or obstruct floodwater" in a manner that is inconsistent with the legally adopted floodplain delineation.

## **Watercourse and Riparian Habitat Protection and Mitigation Requirements of Pima County Floodplain and Erosion Hazard Management Ordinance**

The purpose is to enhance wildlife and recreation values where appropriate by preserving riparian vegetation along watercourses and floodplains and:

Protect the valuable, limited and endangered natural riparian habitat resources of Pima County;

Provide an ecologically sound transition between riparian habitat communities and developed areas;

Assure the continuation of existing or natural functions, values and benefits provided by riparian habitat resources;

Promote an economic benefit to Pima County by providing the aesthetic, recreation and wildlife values of riparian habitat for the enjoyment of residents and visitors; and

Promote natural erosion control

Promote continuity of xeroriparian habitat.

Its purpose is to keep development away from washes. It allows smaller lot sizes and building closer to the edges of lots in exchange for leaving washes natural. The ordinance is incentive-driven. It effects developers who are going through the rezoning and subdivision process. It does not apply to private individuals who are not developing their property.

Washes are classified by the amount and type of vegetation that exists. There are three types: hydroriparian (meaning wet), mesoriparian (meaning medium wet), and xeroriparian (meaning dry).

### Strength

- Recognizes function of riparian vegetation for habitat and erosion control.
- Attempt to design community in harmony with the desert.
- Mitigation requirements.

### Weakness

- Applies only to new development and rezoning.
- Requires Floodplain Use Permit when total of one acre or 10%, whichever is less, of the riparian area of a property is to be disturbed.

## NONREGULATORY PROGRAMS IN ARIZONA

The discussion of nonregulatory programs in Arizona was based upon past research by the ASU team, thesis research (Coltman 1994), information provided by the RAAC, and additional sources as referenced. It is organized by the federal, state, local, and private initiative programs. In each of these categories, programs are presented alphabetically, and each program is briefly discussed and its strengths and weaknesses are listed. Local programs and private initiatives are not discussed in as much detail as the other Arizona efforts.

### FEDERAL PROGRAMS

Federal nonregulatory programs are an important component of a state's wetlands or riparian protection program. In devising or improving a protection strategy, a state can take into consideration and incorporate federal programs. Key nonregulatory federal mechanisms for wetlands protection include acquisition; planning; restoration, creation, and management; incentives and disincentives; and technical assistance, education, and outreach (WWF 1992). It should be noted that, although these federal nonregulatory programs are presented within this chapter discussing existing programs in Arizona, these federal nonregulatory programs are also employed by and important to states outside of Arizona. Therefore, the section Nonregulatory Programs in Other States the reader is directed to the discussion of federal nonregulatory programs.

The U.S. Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency (EPA), the U.S. Soil Conservation Service (SCS), the U.S. Army Corps of Engineers (the Corps), and the U.S. Bureau of Reclamation (Reclamation) are important agencies in the administration of these nonregulatory programs. At the national level, Presidents Carter and Bush were leaders in wetlands policy formulation, bringing wetlands protection national attention (Steiner et al. 1991a). Although President Clinton has developed a wetlands policy, its implication for wetlands protection has yet to be determined.

#### **Clinton Administration Policy on Wetlands (1993)**

President Bill Clinton's administration has proposed a comprehensive package, "a fair, flexible, and effective approach" to federal protection of America's wetlands (White House Office on Environmental Policy 1993, p. 1). In early June 1993, in response to contradictory federal wetlands policies in need of reform, the administration convened the Interagency Working Group on Federal Wetlands Policy. The working group, chaired by the White House Office on Environmental Policy, is comprised of representatives from nine federal agencies, offices, and departments (the EPA, the Corps, Office of Management and Budget, and the Departments of Agriculture, Commerce, Energy, Interior, Justice, and Transportation). This group sought a broad perspective of viewpoints in its efforts to develop wetlands reform initiatives recognizing the value of wetlands and the need to minimize regulatory burdens.

Five fundamental principles were developed by the working group which form the basis for the Clinton administration's comprehensive wetlands policy:

1. The Clinton administration supports the interim goal of no overall net loss of the Nation's remaining wetlands, and the long-term goal of increasing the quality and quantity of the Nation's wetlands resource base;

2. Regulatory programs must be efficient, fair, flexible, and predictable, and must be administered in a manner that avoids unnecessary impacts upon private property and the regulated public, and minimizes those effects that cannot be avoided, while providing effective protection for wetlands. Duplication among regulatory agencies must be avoided and the public must have a clear understanding of regulatory requirements and various agency roles;
3. Non-regulatory programs, such as advance planning, wetlands restoration, inventory, and research; and public/private cooperative efforts must be encouraged to reduce the federal government's reliance upon regulatory programs as the primary means to protect wetlands resources and to accomplish long-term wetlands gains;
4. The federal government should expand partnerships with state, tribal, and local governments, the private sector and individual citizens and approach wetlands protection and restoration in an ecosystem/watershed context; and
5. Federal wetlands policy should be based upon the best scientific information available (White House Office on Environmental Policy 1993, p. 4).

Using these five principles as a foundation upon which to build, the working group developed a comprehensive package of twelve initiatives that include regulatory reforms, non-regulatory policy approaches, and both immediate and long-term policy recommendations. Two such initiatives have already been implemented. In the first, in order to reduce uncertainty for farmers, the Corps and EPA issued a final regulation that eliminated nearly 53 million acres of prior converted wetlands from wetlands regulations. In the second initiative these agencies also issued field guidance that promoted less vigorous permit review of Section 404 permits for small projects with minor environmental impacts. The level of scrutiny is commensurate with the severity of the environmental impact. In determining the appropriate level of analysis, the project-related impacts are as important a consideration as the "functions and values" of the particular waters of the United States that are at risk. The impact of these initiatives and those to follow have yet to be determined in the context of protecting the nation's wetlands resources.

#### Strengths

- National leadership
- The encouragement of cooperation among many agencies and all layers of government
- The goal of no overall net loss of wetlands

#### Weaknesses

- Limited funding opportunities for state governments
- Riparian areas of the arid West are not explicitly addressed
- No implementation strategy or quantifiable objectives exist

#### **Executive Orders 11988 and 11990**

Presidential Executive Orders 11988 and 11990 (Floodplain Management and Wetland Protection, respectively), established by former President Jimmy Carter, brought attention to wetlands protection at the national level. Guidelines for managing wetlands on public lands is addressed in each of these executive orders.

Executive Order 11988 - Floodplain Management recognizes the importance and uniqueness of floodplains and directs agencies to avoid, as much as possible, adverse impacts to floodplains associated with their occupancy and modification. Further, whenever a practical alternative can be identified, actions are to be avoided that indirectly or directly result in floodplain development.

In his statement accompanying Executive Order 11990 - Protection of Wetlands, former President Carter recognized that the nation's coastal and inland wetlands are vital natural resources whose unwise use and development has led to the loss of over 40 percent of the 120 million acres of wetlands inventoried during the 1950s. This executive order, enacted in 1977, states that unwise land-use practices are a major contributor to wetlands loss. It directs federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands in their construction projects, management of properties, and through financial and technical assistance (42 FR 26961). It has been noted that these executive orders have not provided substantial wetlands protection in Arizona and do not explicitly protect important riparian resources (ASP 1988).

These executive orders apply to:

- 1) federal activities, including construction projects, acquisition and disposal of lands;
- 2) grant-in-aid programs; and
- 3) technical assistance to states, including land and water planning, and the building of roads, sewers, and water supply systems.

These executive orders do not apply to federal permitting or licensing on private property (Arizona State Parks [ASP] 1988, p. 5).

#### Strengths

- Gives federal agencies some direction concerning the protection of wetlands
- Motivated some state agencies to consider wetlands functions and values in the preparation of their environmental impact statements (ASP 1988)

#### Weaknesses

- Policies are not legally binding, therefore limited effectiveness
- Have not provided substantial wetlands protection in Arizona (ASP 1988)
- They do not apply to actions on private property
- Riparian areas of the arid West are not explicitly addressed

#### **Flood Control Act of 1936**

The Flood Control Act authorizes the Secretary of Agriculture, through the SCS, to diminish runoff and prevent soil erosion for watershed protection and flood prevention. The SCS develops standards and procedures for watershed surveys and installs flood prevention measures. Riparian areas can function as buffers to reduce sedimentation of streams and rivers.

#### Strengths

- SCS can provide assistance to landowners to minimize soil loss and runoff potential
- Provides assistance directly to landowner utilizing common sense solutions

#### Weaknesses

- Much of the past focus has been on building structures rather than using natural systems, such as riparian areas

### **Food, Agriculture, Conservation, and Trade Act (1990)**

The enactment of the Food, Agriculture, Conservation, and Trade Act of 1990 (also known as the 1990 Farm Bill) strengthened the swampbuster provision (see the Food Security Act) to encourage wetland conservation. This act permanently denies farm program benefits for draining or otherwise manipulating wetlands for the production of an agricultural commodity, whether or not a crop is actually planted. There is a provision for regaining federal benefits if the converted wetlands are restored (U.S. General Accounting Office [GAO] 1991). Protection of wetlands in this way may also offer minimal protection to some riparian areas, although its impact is not known in Arizona.

#### Strengths

- Encourages protection of wetlands

#### Weaknesses

- Minimal protection is provided for riparian areas

### **Food Security Act of 1985**

According to the GAO (1991), by most estimates Section 404 only regulates about 20 percent of the activities that destroy wetlands. Unregulated activities, which are the major causes of past wetlands losses, include drainage, ditching, and channelization for agricultural production. One purpose of the Food Security Act of 1985 (also referred to as the 1985 Farm Bill) is to fill this gap in coverage. It included two major wetlands-related provisions, the swampbuster provision and the Conservation Reserve Program (CRP). Prior to this act, federal agricultural policies indirectly encouraged farmers to convert wetlands to farmland by providing credit and commodity price supports.

Under the swampbuster provision (16 USC 3821), landowners or farmers who convert wetlands after 1985 and use them to produce agricultural commodities are ineligible for federal agricultural benefits (Steiner 1990). Previously, agricultural producers could legally drain a wetland, and as long as they did not plant a commodity crop (defined as an annually tilled crop or sugar cane), they would not lose any federal benefits. Federal financial benefits were denied only in those years when a commodity crop was planted on converted lands. Producers would therefore plant a commodity crop during years when prices were high enough to make federal aid unnecessary, and plant a non-commodity crop during years when federal benefits were needed. The swampbuster provision indirectly encourages protection of wetlands, which could also indirectly protect some riparian areas. It applies to any farmer receiving federal crop subsidies.

CRP's goal is to remove highly erodible croplands from production. Under the CRP, agricultural producers enter into contracts with the federal government to refrain from agricultural production on highly erodible soils for 10 to 15 years in return for annual payments from the government. According to a GAO report, as of July 1991 nearly 34.5 million acres had been enrolled in CRP. This included an estimated 410,000 acres of wetlands (GAO 1991). The impact of these programs on wetlands and riparian area protection in Arizona is unknown.

#### Strengths

- In addition to planting a wetland, draining a wetland now constitutes a violation under the swampbuster program

### Weaknesses

- Minimal protection is provided for riparian areas
- CRP leases only cover 10 to 15 year periods, there are no long-term guarantees for protection

### **Land and Water Conservation Fund Act**

The National Park Service administers the Land and Water Conservation Fund (LWCF) which provides funds to the USFWS for expanding its National Wildlife Refuge System. Wetlands are a significant portion of these refuge lands. In addition, funds are allocated to the Arizona State Parks for recreational purposes which requires the preparation of a SCORP. Recreational monies assist in the acquisition and development of outdoor recreation facilities and areas. In Arizona, the LWCF monies enabled acquisition of the Buenos Aires and San Bernadino National Wildlife Refuges, among other wetlands sites.

### Strengths

- Enables acquisition of wetland sites within Arizona

### Weaknesses

- Funding is limited and subject to political pressure and, therefore, undependable
- Funds are not available for management of required lands

### **National Wetlands Priority Conservation Plan**

Under the Emergency Wetlands Conservation Act of 1986, the USFWS has developed a National Wetlands Priority Conservation Plan. It identifies the locations and types of wetlands that are considered priority sites and should be acquired by state and federal agencies. Monies for acquisition are available through the Land and Water Conservation Fund. Acquisition priorities are determined by the regional USFWS offices. Criteria for acquisition includes the functions and values of wetlands, their historical and potential loss, their benefit to the public, whether they are a rare or diminishing wetland type within an ecoregion, and if they are threatened with loss or degradation.

### Strengths

- Establishes a coordinated national plan that determines priorities in acquiring wetlands

### Weaknesses

- Limited resources for acquisitions

### **Partners for Wildlife**

Established by the USFWS, the Partners for Wildlife is a stewardship program that promotes partnerships between the USFWS and others, including some of Arizona's Indian Tribes and private landowners for restoring, enhancing, and maintaining valuable wildlife habitat while keeping the land in private ownership. Through this program individuals such as ranchers, farmers, and city dwellers as well as organizations such as local or government agencies can improve and protect habitat for fish and wildlife on nonfederal (private, city, county, tribal, and state) lands with the assistance of the USFWS. Such help includes designing and carrying out habitat management projects, technical assistance for wetland restoration, soil and water quality improvements, grazing plans, reducing



pesticide use, creating shelter for fish and wildlife, and developing nesting structures and restoring native plants. Additionally, these partnerships promote education and outreach. Thousands of acres of habitat, including wetlands and their associated uplands, have already been protected and restored for migratory birds and other wildlife.

Examples of projects in Arizona that currently or are proposed to benefit from the Partners for Wildlife Program include the Santa Cruz River, Sonoita Creek, Verde River, Agua Fria River, Aravaipa Creek, and Bill Williams River. Establishment of partnerships in cottonwood and willow riparian areas, such as these areas, is a priority of the USFWS due to the diversity of neotropical migratory birds associated with these areas. Projects that improve wetland, riparian, or other important habitat for native fish and wildlife populations may be eligible for this program.

#### Strengths

- Landowner retains full control of land
- Partnership helps increase biodiversity
- Program is voluntary and available to willing landowners
- Program geared toward addressing local needs, issues, and opportunities

#### Weaknesses

- Usually limited to a maximum of \$10,000 per landowner
- Project needs to be in place for ten or more years
- Assistance limited to federal trust species or their habitat (endangered and candidate species and migratory birds)
- No long-term guarantee for the protection of riparian areas

#### **Section 404 Advanced Identification/Verde River Advanced Identification**

Section 230.80 of the Section 404 (b) (1) guidelines provides for a planning process, known as Advanced Identification (ADID), by which certain waters of the United States are identified as either "potentially suitable" or "generally suitable" for the disposal of dredged or fill material. The ADID process is conducted by EPA and the Corps (or any state that has assumed the Section 404 permitting responsibilities) and includes consultation with the affected state. A variety of federal, state, and local agencies, and other interested participants are typically involved in these projects. The ADID site identifications do not constitute either a permit approval or denial and should be used only as a guide by landowners and project proponents in the planning of future activities. The results of the ADID are strictly informational and advisory. An individual may still apply for a Section 404 permit for sites that have been identified as either "generally unsuitable" or "potentially suitable." The ADID will indicate to potential applicants the relative difficulty of obtaining a permit and will serve to encourage applicants to seek alternative solutions that will avoid impacts to important aquatic sites.

According to EPA's 1992 summary of ADID projects, 35 projects have been completed and 36 projects are ongoing. In Arizona, EPA and the Corps are nearing completion of an ADID for the upper 125 miles of the Verde River from Sullivan Lake to Horseshoe Reservoir. In support of the ADID, USFWS completed a study of the Verde River which includes maps of the riparian areas and a general assessment of the functions and values of the riparian ecosystem and the impacts to these resources (Sullivan and Richardson 1993). This report provides a technical basis for the ADID site identifications which are expected to be finalized by August, 1994.

### Strengths

- Proactive approach to resource identification, protection, and management
- ADID process lends predictability and consistency to the Section 404 permit process
- Serves as an educational venue for the public to increase awareness of wetlands and riparian areas
- Information can be used in other programs to help protect wetland resources
- Cumulative impacts can be assessed during the planning process

### Weaknesses

- Consensus among agencies may be difficult to attain
- ADID process time consuming and costly; may not have resources necessary to undertake an ADID
- ADID serves as a guide and not a guarantee of wetlands protection
- CWA jurisdiction often does not include the entire riparian corridor
- The ADID, as part of the 404 program, only directly addresses impacts to waters from fill activities (and is not relevant to water supply and many land use issues)

### **Soil Conservation Service Riparian Policy**

Soil Conservation Service (SCS) provides assistance to land managers in recognizing the values of riparian areas including their contribution to flood control, streambank stabilization, nutrient cycling, pollutant filtering, and sediment retention. The SCS planning process which leads to development of a Resource Management System (RMS) is utilized during assistance with landowners. A RMS incorporates agency policy for riparian areas and addresses total resource concerns for soil, water, air, plant, animal, and human resources. Riparian area management is integrated into plans and management alternatives. Management alternatives are based on those resource problems and conservation treatments necessary to solve all the resource problems and meet the land user's objectives.

The SCS policy for riparian areas states that "This policy is to guide SCS personnel in providing assistance on lands that include riparian areas. SCS assistance helps land users make sound resource management decisions. SCS must strive to provide the best alternatives for the proper use and management of these important resources."

### Strengths

- The policy contains a clear definition.
- The importance of riparian areas is recognized from the standpoint of functional ecosystem value in the assistance SCS provides to the public for conservation plan development.
- The interrelationship between riparian areas and the rest of the ecosystem is emphasized.
- The importance of an interdisciplinary approach to management of riparian areas is recognized.

### Weaknesses

- There is no clear guidance on methodology for delineation of riparian areas.

## **BLM Riparian-Wetland Initiative**

[Rank: Moderate to low]

The U.S. Bureau of Land Management (BLM) in 1987 developed a Riparian-Wetland Initiative establishing four nationwide goals and six broad categories of strategies for implementing these goals. Highlights of the goals include: 1) restore and maintain riparian-wetland areas such that, at a minimum, 75 percent of these areas are in proper functioning condition by 1997; 2) use appropriate land management, avoid or mitigate adverse impacts, and acquire and expand key areas to protect riparian-wetland areas and their associated uplands; 3) establish an aggressive outreach program that involves training and research; and 4) improve partnerships and cooperative efforts in implementing the BLM Initiative.

Implementation strategies include: 1) inventory and classification; 2) land use and activity plan preparation and revision; 3) project development and maintenance; 4) monitoring actions to determine if objectives are being met; 5) protection and mitigation of disturbances to riparian-wetland areas; and 6) acquire and expand riparian-wetland areas primarily through land exchanges.

Improving the functioning condition of the riparian-wetland areas is the focus of BLM restoration goals. These areas are in proper functioning condition when adequate vegetation is present and the following five criteria are met: (1) dissipate energy associated with high water flows, thereby reducing erosion and improving water quality; (2) filter sediment and nutrients and aid in floodplain development; (3) contribute to root mass development that stabilizes banks against erosion; (4) develop disperse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and (5) support greater biodiversity.

In Arizona, only 0.35% of the BLM lands are classified as riparian-wetlands. As of 1990, on BLM-Arizona administered land only 0.8% of these areas were meeting objectives, 1.3% were not meeting objectives, and the remaining 97.9% were of unknown status.

### Strengths

- Federal institutional efforts to systematically address riparian-wetland issues.
- Establishes a high priority for riparian improvement activities on BLM-managed land throughout the West.
- Allows flexibility for states to establish specific objectives and priorities for implementing this initiative consistent with the state's needs, funding, and laws.
- Monitored areas that are actively and consistently managed have documented positive improvements because of the efforts.

### Weaknesses

- General guidelines allow for variation in implementation of management practices by BLM districts.
- Normally takes years for degraded riparian-wetland areas to recover (i.e., 3-10 years).

- Budgetary constraints do not allow for rapid implementation.
- Policy only, no "teeth".

### **U.S. Bureau of Land Management San Pedro National Riparian Conservation Area**

The San Pedro RNCA contains about 40 miles of the upper San Pedro River and over 50,000 acres of public land in Cochise County. It was designated by Congress as a NCA on November 18, 1988. This land area, the core area being an old Spanish land grant along the San Pedro River, was acquired by the BLM through a land exchange to protect and manage for riparian resource values.

#### Strengths

- BLM owns and controls the land area and can prevent direct impacts to riparian woodland resources from occurring on the parcel
- As the first Arizona BLM National Riparian Conservation Area (NRCA), this area has received more attention and funding than some other BLM riparian areas
- High local interest, both public and private
- Reserved Federal Water Right also gives some protection to the river

#### Weaknesses

- Impacts to surface water quantity and quality from activities in the headwaters of the San Pedro in Sonora, Mexico cannot be controlled by the BLM
- Impacts to surface flow from groundwater pumping off of the BLM parcel are of concern (Hydrologic and geologic research are being conducted on this subject)
- Funding is subject to budgetary problems of BLM
- Groundwater pumping nearby may affect flows

### **U.S. Bureau of Land Management Gila Box National Riparian Conservation Area**

The Gila Box RNCA was designated in the Arizona Desert Wilderness Act of 1990 in order to conserve, protect, and enhance its riparian areas and associated resources and the aquatic, wildlife, archeological, paleontological, scientific, cultural, recreational, educational, scenic, and other resources and values of such areas. The Gila Box has approximately 21,767 acres of public land and 1,720 acres of private land with a 15 mile segment of Bonita Creek and 23 miles of the Gila River within its designated boundary.

BLM is required to develop an Interdisciplinary Activity Plan/Environmental Assessment (IAP/EA). The IAP/EA will provide a detailed and site specific management plan for allocating and managing the resources within the Gila Box RNCA under the principle of multiple use coupled with the constraints of the "Arizona Desert Wilderness Act of 1990 Title II".

#### Strengths

- BLM owns and controls the land area and can prevent direct impacts to riparian woodland resources from occurring on the parcel
- High local interest, both public and private
- Reserved Federal Water Right provides some protection to the river

### Weakness

- Funding is subject to budgetary problems of BLM

### **U.S. Environmental Protection Agency Wetlands Program State Development Grants**

In fiscal year 1991, EPA provided \$5 million in grants for state development or enhancement of wetlands protection programs. In turn, states must provide a 25 percent match in requested funds. Priority is given to innovative projects with transferability. According to the World Wildlife Fund (WWF) (1992), projects likely to be funded include: state wetland conservation plans; the integration of wetlands into water and natural resource programs; multi-objective river corridor management; incorporating wetlands into Section 401 certification; expansion of existing regulatory program jurisdiction and regulated activities; and monitoring.

ADEQ has received four grants through this program. In 1990, Frederick Steiner, et al. of Arizona State University was contracted and developed *The Interrelationship Between Federal and State Wetlands and Riparian Protection Programs*. In 1991 two contracts were developed to report on the functions that riparian vegetation perform for water quality and the other to assist in the develop of narrative standards for wetlands. In 1992, two contracts were developed to assess constructed wetlands for improving water quality from municipal effluent, urban runoff, and agricultural facilities. In 1994, another grant was awarded to ADEQ to map 404 permitted activities in Arizona on GIS format.

### Strengths

- Provides funding for state wetlands protection efforts
- Grants are available to state agencies responsible for wetlands, water quality, or other wetlands-related programs and to federally recognized Indian tribes (WWF 1992)
- Grant monies can enable states to improve existing programs and develop innovative approaches to wetlands protection

### Weaknesses

- Limited funds available on a nationwide basis
- States must provide a 25 percent match
- Riparian areas of the arid West are not explicitly addressed
- Funds generally are available for studies or research only

## STATE PROGRAMS

An important element in devising a riparian protection program for Arizona lies in understanding the state's existing nonregulatory programs that directly or indirectly protect riparian areas and assessing their strengths and weaknesses. The nonregulatory programs discussed in this section are administered by such agencies as the Arizona Department of Environmental Quality (ADEQ), Arizona Department of Transportation (ADOT), Arizona Game and Fish Department (AGFD), Arizona State Land Department (ASLD), and Arizona State Parks (ASP). In addition to specific agency programs, other efforts to gain an understanding of and protection for riparian areas are discussed.

### **Arizona Clean Lakes Program**

The Arizona Clean Lakes Program is watershed-based where conservation, protection, and enhancement are considered. Three EPA grants have been received by ADEQ for Phase I Diagnostic/Feasibility studies for Roosevelt Lake, Painted Rocks Lake, and Rainbow Lake. The Arizona Clean Lakes Program Protocols have defined a process to identify, plan, and prioritize lake reconnaissance, monitoring, and Phase I studies.

#### Strengths

- Provides funding for lake assessments
- Pollutants from tributaries are included in assessment
- Best management practices are considered as part of measure to improve lake quality

#### Weakness

- Initial phases of program have been reactive rather than proactive; assessment occurs when problem(s) are noticed

### **Arizona Department of Environmental Quality Water Quality Programs**

The mission of ADEQ is to protect public health and to preserve, protect, and enhance the environment of Arizona. ADEQ does not have a specific legislative mandate to protect riparian areas. Yet some level of protection is afforded these resources through ADEQ's role in establishing, monitoring, and enforcing water quality standards for both surface waters and groundwater. ADEQ has several programs which help preserve and protect riparian resources in the state. ADEQ is currently developing water quality standards for wetlands and assessing the water quality functions of riparian vegetation.

#### ADEQ nonregulatory water quality programs include the following:

Nonpoint Source Management Program for Best Management Practices. The NPS program for BMPs is described in further detail in the Regulatory section of this chapter. The BMPs developed for this program are NOT in rule at this time. BMPs for rangeland activities, resource extraction, and urban runoff are being developed through an advisory committee comprised of affected industry, agency representatives, and knowledgeable people.

Nonpoint Source Zone Management Plan. The nonpoint source zone management plan targets specific geographic areas for setting priorities and developing management practices. Two such zone management areas have been established--one in the Duncan-Safford area, the other in the Verde Valley.

### Strength

- ADEQ can provide design protection of riparian areas around water quality and its authority to protect water quality from nonpoint sources of pollution

### Weaknesses

- No legislative authority to directly protect riparian areas
- A lack of resources and enforcement power limit the usefulness of nonpoint source programs

### **Arizona Department of Transportation Wetlands Preservation Policy**

The ADOT's Highway Division plans and develops roads and transportation facilities within the state of Arizona. Often, sources of materials for these construction projects are extracted from riparian areas and the construction activity itself may impact riparian areas. ADOT does not have a mandate to preserve and protect riparian areas, but it has developed a wetlands preservation policy. This policy encourages new construction projects to try to avoid impacts to wetlands, and when this is not possible, to use mitigation measures to minimize the harm to wetlands from highway construction projects. Another way ADOT helps protect wetlands is to require that it will only accept materials extracted from wetlands where the material site has obtained all the appropriate federal and state permits and approvals.

### Strength

- Recognizes the importance of wetlands and promotes their protection through avoidance, minimization, and compensation practices

### Weakness

- Riparian areas are not explicitly protected

### **Arizona Game and Fish Commission Policy and Procedure for Wildlife and Wildlife Compensation**

In its policy on wildlife and wildlife compensation, the Arizona Game and Fish Commission requires 100 percent compensation for losses (or potential losses) from federally funded and state administered land and water projects including projects requiring Section 404 permits. (A similar policy addresses actions on lands administered by the State Land Department.) Habitat compensation plans must be designed according to AGFD standards that take into consideration the impact to special category or economically important Arizona wildlife species, and the value of the associated habitat. The overall goal is to avoid or minimize habitat loss, with compensation as a last option.

### Strengths

- Goal is for no loss of existing in-kind habitat value of riparian areas associated with perennial waters
- Provides guidance for Section 404 mitigation at the local level
- Policy is used by the AGFD as guidance in projects in which it interfaces

### Weakness

- Only applies to federal or state actions

### **Arizona Game and Fish Commission Policy on Riparian Habitat**

The Arizona Game and Fish Commission policy is to recognize riparian habitats as "areas of critical environmental importance to wildlife and fisheries" (AGFD 1987, p. 1). It encourages management practices for maintaining existing riparian habitat and for restoring deteriorated riparian habitat. In addition, it promotes maintaining, restoring, and protecting instream flows which are essential to maintaining riparian habitat.

#### Strength

- Policy is used by the AGFD as guidance in projects in which it interfaces

#### Weaknesses

- Guidance only
- Applied by only one agency

### **Arizona Game and Fish Department Game, Nongame, Fish, and Endangered Species Fund**

A voluntary "check-off" on Arizona State income tax refunds allows taxpayers to contribute all or a part of their refund in support of AGFD's nongame wildlife programs. This fund was established to assist with activities related to game, nongame, fish, and endangered species. For example, monies have been used for protecting endangered species and researching techniques for protecting various species.

#### Strengths

- Provides a source of funding for riparian area protection
- Encourages volunteerism

#### Weaknesses

- Funds are dependent upon taxpayer donations and therefore there could be high variability in the amount available for this program each year
- Must compete with increasing number of check-offs on tax form
- May be lost if state income tax is eliminated

### **Arizona Game and Fish Department Heritage Data Management**

The AGFD Heritage Data Management System is a database of locality information for threatened, endangered, and sensitive plants and wildlife.

#### Strengths

- The database provides a means to identify sensitive species which may be found in an area proposed for development and as such assists in avoidance of impacts
- AGFD's ongoing mapping of riparian areas along perennial and intermittent streams will provide a strong database for this program

#### Weaknesses

- The database compiles locations of sensitive species documented in the scientific literature and field notes. Comprehensive surveys have not been conducted for all species for all areas. Lack of records in an area cannot be assumed to mean that sensitive species are not present.



- Lack of systematic data concerning riparian habitat

### **Arizona Game and Fish Department Project Wild and Aquatic Project Wild**

Project Wild is an environmental and conservation education program emphasizing wildlife, designed for teachers of kindergarten through high school aged children. Aquatic Project Wild focuses on water and the life it supports. The Department aquatic education program also conducts riparian workshops for educators.

#### Strength

- Popular educational program

#### Weaknesses

- Educational only
- Does not reach adults; designed mainly for teachers of youth

### **Arizona Natural Areas Program**

According to Arizona Natural Heritage legislation, a natural area is defined as: A parcel(s) of land or water that contain examples of unique natural terrestrial or aquatic ecosystems, rare species of plants and animals, or unusual or outstanding geologic features. The Arizona Natural Area Program (ANAP), which manages the daily operations of the Natural Area activities, is overseen by the Arizona State Parks Board (ASPB).

The Arizona Natural Areas Program (ANAP) purpose is to establish a system of State Natural Areas to preserve the diverse natural heritage of Arizona for public benefit, through acquisition and designation of lands having primarily global, but also national or state significance with regard to plant or animal species, habitats/communities, or geologic/hydrologic features. Program objectives seek to increase awareness of the state's diverse natural resources and benefits of preservation. Public access and use of these state natural area parks is a secondary consideration. Recreational opportunities will be available at some point; the focus will be low-impact experiences and environmental education.

The program is assisted by seven-member citizens committee comprised of environmental scientists and natural resource professionals whose purpose is to provide assistance and guidance to program staff (Land Steward). The committee, in concert with the Land Steward, investigate potential natural areas sites and make recommendations annually to the ASPB for acquisition and management of significant natural area parks. Sites recommended and designated can be within existing parks or can be other lands.

Funding for the program comes from the Arizona Heritage Fund. The Heritage legislation allocates \$1.7 million for land acquisition and \$400,000 for operation and management of designated sites annually.

Riparian areas are identified as a priority for ANAP consideration. When riparian areas are acquired and designated they are to be managed according to ANAP policy guidelines. The guidelines state that each will be managed for the preservation of significant natural features for which it was designated, emphasizing the maintenance of the natural processes, whenever possible. Since State Natural Areas are part of the State Parks system, an area may be managed for low-impact recreational access; however, the primary mandate is protection of the resource and not recreational opportunities.

**EXAMPLE:** Riparian area acquisition occurred in early 1994 when a segment of approximately 3 miles of lower Sonoita Creek and the uplands, west of Patagonia Lake and east of Rio Rico was purchased for \$2.8 million. The 5,000 acre acquisition set aside the riparian corridor and 4,000 acres of desert upland as State Parks' first State Natural Area Park. The NAAC recommended purchase of the adjacent uplands to increase the protection factor for the riparian area. State Parks foresees purchase of adjacent state lands to the east which will further buffer the area from adverse impacts. The budget of \$1.7 million annually does limit the amount of riparian protection that can be accomplished statewide; however, this fund provides the opportunity to work with other agencies on cooperative management options.

#### Strengths

- Arizona Heritage Legislation earmarks fixed amounts annually for acquisition and operation and management of riparian areas for State Natural Areas Parks.
- Acquired riparian areas likely to be secure from further degradation with increased potential for enhancement and restoration.

#### Weaknesses

- Limited funds restrict ability to obtain substantial acreage any one year. Acquisition limited to private lands, of which 17.06% of perennial waters in Arizona are in private ownership (AGFD 1993). Further, the operation and management funds are not sufficient to sustain multiple areas without depleting the annual allotment.
- Natural areas designation does not exclude the potential for adverse activities that could degrade or destroy riparian features or functions. It is unlikely though, that State Parks management would allow for activities that would rescind designation status.

### **Arizona Navigable Stream Adjudication Commission Riparian Trust Fund**

The state has a claim of ownership of the beds of streams within the state that were navigable on February 14, 1912. The Arizona Navigable Stream Adjudication Commission was originally created to make navigability determinations following studies and hearings. Statutory changes in the Forty-First Legislature, Second Regular Session, changed the commission's role from determination of navigability to recommendations to the legislature. The legislature will then make the determinations.

The Riparian Trust Fund was established to receive funds from the use or disposition of State owned streambed lands. The Riparian Trust Fund monies are to be used to support the activities of the commission and to acquire and enhance riparian areas.

#### Strength

- Under state ownership, the public values associated with streambeds must be protected

#### Weaknesses

- Establishing state ownership of streambeds has historically been a slow, laborious and litigious process
- The Riparian Trust Fund is not likely to receive revenue in the near future
- The state's ownership claim is limited to the normal low water mark which may not include the more significant riparian values

### **Arizona Rivers Assessment**

Arizona State Parks and the National Park Service Rivers, Trails and Conservation Assistance Program initiated the Arizona Rivers Assessment in 1990, to identify and evaluate river, stream, and riparian resources on a statewide basis. Nearly 1500 channel segments were identified according to EPA Reachfile 2 criteria. State, federal, tribal, and local agencies were requested to provide existing resource information for reaches within their jurisdiction, according to a format developed specifically for the assessment. The first of two phases examined natural resources; the second phase examined recreational uses. Results of the study are expected to be published this year.

#### Strength

- Provides some insight into the availability of Arizona river/riparian data during 1991-92

#### Weaknesses

- Data for any given resource category were received for only one-fourth to one-half of the reaches included in the assessment
- Most of the questionnaires returned were incomplete, and/or had many responses rated "low confidence" by the agency personnel who submitted them
- At present the Arizona Rivers Assessment is in draft form only and has not been subject to interagency review. Careful review should be completed before any products of the process are released for use.
- Complete information is included for only 200 streams in Arizona
- Relies on "volunteered" existing information which can result in conflicts and inconsistencies in the data

### **Arizona Wetlands Priority Plan**

The Arizona Wetlands Priority Plan was prepared to comply with the Emergency Wetlands Resources Act of 1986 which essentially required a wetlands component to all SCORP. Arizona State Parks was the lead agency in a cooperative effort with two federal agencies and five state agencies in the preparation of a wetlands addendum to the 1983 SCORP.

The 1994 Wetlands Priority Plan under preparation is an update of the previous plan, citing the pending and completed RAAC-related studies, and the pending RAAC recommendations are likely to have a substantial influence on the wetlands protection priorities in Arizona. In other words, the plan will reflect the recommendations of the RAAC.

#### Strength

- The plan offers the opportunity to make the case for identifying and protecting regionally significant wetlands types (including riparian areas) to meet federal mandates

#### Weaknesses

- The plan is required to specifically address priorities for government agencies acquisition of privately held wetlands
- Annual Land and Water Conservation Fund appropriations for acquisition of identified priority sites are typically insufficient for the intended purpose
- Owners of identified priority properties may be indifferent or openly hostile to the process

### **Central Arizona Project Water Protection Fund**

The Water Protection Trust Fund, which was passed during the 1994 legislative session, was established to provide grant monies to public and private entities to enhance, protect, and restore the state's rivers, streams, and associated riparian habitat, including fish and wildlife resources. The fund will provide \$4 million the first fiscal year (1994-1995), \$6 million the second year, and \$5 million per year thereafter. This new program will be administered by a commission composed of 4 ex-officio members and 15 appointed members who have demonstrated an interest in natural resources.

#### Strengths

- Long-term commitment of state
- Enables proactive approach for riparian protection
- Mandated to evaluate statewide riparian habitat conditions and identify issues and areas of concern every three years

#### Weakness

- Funding dependent upon annual appropriation of general fund and CAP water sales

### **Heritage Fund**

In 1990 Arizona voters approved the Heritage Initiative (with 67% of voter approval), which created the Arizona Heritage Fund. Through this fund, \$20 million per year of lottery funds are dedicated to the protection of Arizona's natural and cultural heritage under the direction of the ASPB and AGFD. These agencies equally divide the money for specific environmental programs and acquisitions.

AGFD is authorized to use these funds for a number of purposes such as habitat inventory, acquisition, identification, and habitat evaluation and protection, and environmental education. ASPB is authorized to use funds for the development and acquisition of parks and natural areas, historic and cultural preservation, and for matching grants to local groups for parks, trails, environmental education, and cultural resources. This new funding source enables the protection of riparian habitat through the acquisition of lands expressly for habitat protection.

#### Strength

- Provides significant source of funding for riparian area protection

#### Weakness

- The fund has been challenged several times by state legislators

### **Natural Resource Conservation Districts**

Natural Resource Conservation Districts (NRCs) have been established by state law and work in cooperation with SCS as their primary mechanism for assisting private landowners and users, and for assisting state land holders with conservation planning and technical assistance. NRCs provide guidance to their cooperators and may establish inventories and resource management plans for watersheds and other planning units. Landowners may request assistance from the SCS through their NRCs in developing management plans for their natural resources.

In addition to the 31 NRCs which are established under state law, there are 7 Soil and Water Conservation Districts (SWCDs) that exist under tribal law. They operate with similar

authority and purpose and have the same relationship with the SCS. These tribal conservation districts will be a key link to dealing with riparian projects on tribal lands.

In Arizona, the NRCDs and the SCS have assisted with dormant stub plantings in riparian areas, in addition to growing riparian species for revegetation projects.

#### Strengths

- Conservation districts can and have sponsored cooperative efforts for the conservation of watershed resources that are integral with the health of riparian areas
- Conservation districts and SCS have longstanding ties in rural communities
- Conservation districts and SCS are significant sources of information about natural resources
- The focus is changing to more fully consider ecosystem management
- The Verde NRCD and the SCS plant materials centers have riparian plant stock available

#### Weakness

- The historical focus of SCS and conservation districts has been on soils not ecosystems and has emphasized flood protection and erosion control through structural measures

#### **State Lake Improvement Fund**

This program was established to improve boating related resources and facilities and ensure the safe use of the lakes and rivers where boating is permitted. Approved by the legislature in 1960, State Lake Improvement Fund (SLIF) revenues come from taxes levied on watercraft licenses and motor fuel. These monies are appropriated each year through the Arizona State Parks Board budget. These revenues provided a source of funding for the Verde River Corridor Project.

#### Strength

- Provides a source of funding for projects that include riparian area protection

#### Weaknesses

- Amount of funding is limited
- Expenditures of the State Lake Improvement Fund are limited to statutory purposes and included restrictions. Specifically, ARS § 5-382 B. includes a restriction that "...projects do not interfere with any vested water rights, or the operation or maintenance of water projects, including domestic, municipal, irrigation district, drainage district, flood control district or reclamation projects."

#### **Statewide Comprehensive Outdoor Recreation Plan 1988 and 1989**

In 1988, as directed at the federal level through the Emergency Wetlands Resources Act of 1986, Arizona State Parks added a wetlands component, the Arizona Wetlands Priority Plan, as an addendum to its 1983 SCORP report. One recommendation made in this plan was the development of an executive order from the governor directing state agencies to consider how their agency actions impact wetlands and to take the necessary steps to avoid unnecessary degradation and destruction of these valuable resources. Other recommendations included the development of an executive policy to heighten the environmental and economic importance of these resources and the development of other mechanisms to resolve conflicts surrounding riparian issues in the state.

Included in the 1989 SCORP report, the Arizona Rivers, Streams, and Wetlands Study

identified environmental concerns and provided recommendations to protect and enhance the environmental quality of Arizona's natural resources. Four key management actions were proposed to ensure continued recreational opportunities and simultaneously ensure appropriate conservation of the state's streams and wetlands resources (SCORP 1989, pp. 12-13):

1. Enactment of a state streams and wetlands policy.
2. Establishment of a management program for policy implementation.
3. Development of a forum for intergovernmental coordination.
4. Development of an effective forum for active citizen participation.

The SCORP is currently undergoing its update, required every five years.

Strengths

- State-level recognition of the value of wetlands
- Provides protection strategies for wetlands

Weakness

- No long-term protection of riparian areas

**Waterfowl Conservation Fund (Arizona Duck Stamp Program)**

The Waterfowl Conservation Fund, administered by Arizona Game and Fish Commission, consists of monies received from selling waterfowl stamps and artwork. Monies from the fund may be spent for developing migratory waterfowl habitat and associated research and management to increase the number of migratory waterfowl in Arizona.

Strength

- Source of funds for development and purchase of migratory waterfowl habitat

Weakness

- These limited monies can only be used for migratory waterfowl habitat

## LOCAL PROGRAMS

A statewide riparian protection strategy should recognize and address local needs, concerns, and resources. Nonregulatory strategies at the local level may include acquisition; planning; restoration, creation, and management; incentives and disincentives; technical assistance, education, and outreach; and research. An example of a program initiated at the local level is discussed.

### **Floodprone Land Acquisition Program - Pima County**

The Pima County Flood Control District's Floodprone Land Acquisition Program mitigates flood and erosion damage, maintains groundwater recharge, preserves wildlife habitats and recreational open space, and reduces disaster assistance and emergency relief needs. This voluntary program involves purchasing occupied and vacant flood- and erosion-prone land from private owners. The primary purpose of the program is to implement nonstructural flood control (in this case acquisition) where this has been identified as the most effective floodplain management strategy. Providing open space needs is a secondary benefit.

Acquiring floodplain property is an innovative technique which can reduce flood losses. One study commissioned by the District estimated flood-peaks would increase 40% if upstream floodplains were developed and channelized per conventional structural flood-control programs.

#### Strengths

- Demonstrated cost-effectiveness of acquisition compared to structural flood-control measures.
- Natural moderation of floods by reducing flood velocities, flood peaks, and flood depths.
- Water quality maintenance by natural infiltration and filtration of storm water and reduction of downstream siltation and debris.
- Provides and preserves natural open space areas in some urban environments.
- Increased groundwater infiltration within natural channels, enhancing groundwater recharge.

#### Weaknesses

- There is dedicated funding source but it maybe insufficient to acquire all properties that have been requested at a given time.
- Although the intent is to acquire entire stream reaches, because the program is voluntary some owners may not want to participate.

### **Verde River Corridor Plan**

According to the WWF (1992), an estimated 500 local greenway efforts (targeting areas adjacent to rivers or streams, lakes or the coast) have been implemented or are currently underway. Often community-based, they serve multiple objectives, such as recreation, flood loss reduction, or pollution reduction. Greenways have the potential "to protect not only individual wetlands in a river or stream corridor but also the wetlands' water supplies, buffer areas, and linkages with other areas" (WWF 1992, p. 35).

The Verde River Corridor Project (VRCP) grew out of local concern for the issues affecting the Verde River and a strong desire to become intimately involved with decisions about the river. Formed in 1989, the VRCP's goals were to identify and examine all the uses and values of the river and to develop a plan of action agreeable to the public and managing agencies (ASP no date). The Verde River Corridor Project Action Plan is made up of an overall vision and mission, guiding

principles, the top ten priority actions, and specific recommendations and goals of subcommittees.

Strengths

- Stresses local control of direction and recommendations for actions affecting the Verde River
- The VRCP action plan tries to balance interests and accommodate multiple uses where compatible
- Plan is advisory and supportive in nature and does not add another layer of regulation

Weaknesses

- Policy, not regulation, and therefore actions taken are often voluntary
- Because area experiencing tremendous growth, pressure may be exerted to change regulation and management along the Verde River



## PRIVATE INITIATIVES

Riparian area protection may be limited by a lack of resources, such as funding and staffing, as well as by agency authority, at the federal, state, and local level. According to the WWF (1992, p. 28), "these constraints can be overcome in part by working with and strengthening nongovernmental constituencies... ." Such private initiatives include recreational and environmental organizations, individuals and corporations, and private nonprofit organizations. To minimize repetition of program discussion, the reader is advised that although many of the private initiatives discussed in this chapter (existing nonregulatory programs in Arizona), primarily national nonprofit organizations, also play a significant role in other states, their discussion will be limited to this chapter.

### **Arizona Flycasters Club**

Concerned with protecting fish and fish habitat for warm, cold, and salt water species, the Arizona Flycasters Club is active in many projects for restoring riparian areas. It is the largest club (over 400 members in Phoenix alone) within the Federation of Flyfishers (FFF) and has contributed both money and labor in its efforts to improve riparian areas. Together with other organizations, such as Trout Unlimited, it has assisted with restoration projects on Canyon Creek, the West Fork of the Black River, Saguaro Lake, and a recovery project in the Tonto Forest. Much of their effort is in building fences to limit the presence of cattle in riparian areas.

#### Strengths

- Promotes volunteerism
- Can easily focus time and money on local issues and concerns

#### Weakness

- Limited in its ability to influence the public and elected officials

### **Arizona Riparian Council**

The Arizona Riparian Council (ARC) was formed in 1985, shortly after the First North American Riparian Conference was convened. The ARC was organized to educate the public on the values of riparian areas based upon scientific information and to influence public policy decisions. A common thread among the broad spectrum of ARC members is the conservation and wise stewardship of riparian areas in Arizona and throughout the West. Recognizing a need for a comprehensive riparian classification system and statewide inventory, the ARC established a committee to work with federal and state agencies, and other organizations in order to coordinate a common classification system that all could use.

#### Strengths

- Voluntary group focused on Arizona riparian areas
- A valuable source of information concerning riparian areas and the protection of riparian resources

#### Weaknesses

- The group is not empowered to protect riparian areas directly
- Limited funding

### **Arizona Wildlife Federation**

The Arizona Wildlife Federation is a nonprofit conservation education organization dedicated to protecting the state's wildlife and natural resources. It is the state affiliate of the National Wildlife Federation and has approximately 10,000 memberships in Arizona, consisting of individuals and sportsmen clubs. Members are informed of environmental issues and activities through a quarterly publication, "Arizona Wildlife News" and their various club meetings. The Arizona Wildlife Federation receives its sole support through its volunteers who are involved in a wide range of activities, mainly to influence land uses such as grazing, silviculture treatments, and recreation. Habitat improvement projects have benefited riparian areas, such as building check dams along the Dude Creek after the Dude Fire. The Federation also assists federal and state agencies with projects.

#### Strengths

- Promotes solutions based on science
- Involves volunteers

#### Weakness

- No specific policies for riparian protection

### **Friends of the San Pedro River**

Friends of the San Pedro River, Inc. is a nonprofit membership organization dedicated to supporting the Bureau of Land Management's San Pedro Riparian National Conservation Area. The Friends' goals are: 1) provide environmental education to further the conservation, protection and enhancement of the NCA, 2) design and/or implement projects utilizing contributed labor and/or funding to enhance the NCA, and 3) become proactive in community affairs, specifically as the Impact the San Pedro ecosystem.

#### Strengths

- Involves citizens concerned with the preservation and enhancement of the area
- Promotes volunteerism

#### Weakness

- Limited funding

### **Friends of the Santa Cruz River**

Friends of the Santa Cruz River is a citizen group dedicated to preservation of riparian resources along the effluent dominated Santa Cruz River (Tellman 1992). It is also concerned with preserving the flow of effluent and maintaining high water quality within the stream. This group is working with the Arizona State Parks Board in its "corridor study" for the area which will include a management plan based largely on local citizen input. Local citizens recognize the importance of taking some responsibility and providing direction in influencing decision-making concerning the river at the state and federal level (ASP 1992).

#### Strengths

- Involves citizens concerned with solving local issues
- Promotes volunteerism

### Weakness

- Limited funding

### **Malpai Borderlands Group**

The Malpai Borderlands Group initiated by private landowners in southeastern Arizona and southwestern New Mexico and will encompass one million acres. The importance of fire as an ecological process was identified as the initial common ground. The focus has evolved into developing an ecosystem system approach to achieve better resource management on the ground and to improve coordination between private and public landowners.

The group's goal statement is to "Restore and maintain the natural processes that create and protect a healthy unfragmented landscape to support a diverse, flourishing community of human, plant, and animal life in our borderlands region. Together we will accomplish this by working to encourage profitable ranching and other traditional livelihoods which will sustain the open space nature of our land for generations to come."

### Strengths

- Cooperative effort between private landowners and public agencies, including SCS, USFWS, USFS, BLM, and two state game and fish departments
- Comprehensive way to look at ecosystem functions which cross jurisdictional boundaries and covers a broad geographic area
- Support and involvement from private organizations

### Weaknesses

- Difficult to identify common concerns among diverse interests
- Crosses different jurisdictional boundaries, making developments of a management plan complicated and difficult
- Many public agencies involved which have particular agency missions to follow

### **National Audubon Society**

The National Audubon Society (NAS) has acquired approximately 500,000 acres of wetlands in order to protect wildlife habitat mainly through its sanctuary system nationwide. It also promotes the protection of wetlands and riparian areas through advocacy and education of its members and the general public.

In Arizona it manages the National Audubon Appleton-Whitell Research Ranch Sanctuary near Elgin on land that is jointly owned by NAS, USFS, BLM, and private landowners. The sanctuary supports diverse riparian communities and provides information and leadership to protect native ecosystems.

There are seven local chapters of the Audubon Society within Arizona. They are all active in protecting riparian areas within their respective territories using advocacy, education, and cooperation with Federal and State agencies.

### Strength

- Ability to marshal support for riparian protection from members

### Weakness

- Limited funding

## **Sierra Club**

The Sierra Club promotes public awareness about conservation and the environment and influences public policy through lobbying and taking legal action. Educational opportunities are provided through meetings, outings, calendars, and books. A nonprofit organization, the Sierra Club receives direct support through its nearly 600,000 members nationally (including about 10,000 individual/family memberships in Arizona). Protection of riparian areas is an indirect result of the Sierra Club's support of the Clean Water Act, in terms of wetlands protection, and also its interest in wilderness protection and Wild and Scenic River bills. The primary ways the Sierra Club restores and protects riparian areas is through its efforts with grazing and mining reform

### Strengths

- Successful in influencing public policy
- Promotes volunteerism, primarily for monitoring sites and occasionally in conjunction with agencies or other organizations

### Weaknesses

- Receives no public funding
- Dependent upon volunteers
- Limited resources prevents ability to do on-site restoration or other similar activities

## **The Conservation Foundation: The National Wetlands Policy Forum**

In the summer of 1987, The Conservation Foundation, at the request of EPA, assembled the National Wetlands Policy Forum (commonly known as the Forum) to discuss measures to improve the protection and management of wetlands across the nation. The purpose of the Forum was to gain a broad perspective of the major issues facing wetlands protection and develop recommendations for improving federal, state, and local wetlands protection policies (The Conservation Foundation 1988).

The Forum was chaired by Governor Thomas H. Kean of New Jersey and composed of three governors, a state legislator, various heads of state agencies, a town supervisor, chief executive officers of environmental groups and businesses, farmers and ranchers, and academic experts. Participation of senior officials of five key federal agencies also provided insight on wetlands protection and management, but these officials were not asked to endorse any of the recommendations considered by the Forum participants. Over 100 recommendations were agreed upon through discussion and debate among the Forum participants and through public workshops held during May 1988. These recommendations fall into three categories: protecting the resource; improving the protection and management process; and implementation. The primary recommendation for protecting wetlands was the establishment of a clear coherent goal, which was the origin of "no net loss." Specifically, the Forum recommended that:

the nation establish a national wetlands protection policy to achieve no overall net loss of the nation's remaining wetlands base, as defined by acreage and function, and to restore and create wetlands, where feasible, to increase the quality and quantity of the nation's wetlands resource base (1988, p. 3).

The Forum recommended that states take action in protecting and managing wetlands through comprehensive planning to achieve the overall goal of no net loss. The Forum also encouraged state leadership in wetlands protection (WWF 1992). Additionally, interim and long-term goals were recommended. The interim goal was the achievement of no overall net loss of the nation's remaining wetlands base, while the long-term goal promotes increasing the quantity and quality of the nation's

resource base (The Conservation Foundation 1988). (Note: The Conservation Foundation merged with the World Wildlife Fund and the latter name is now used exclusively.)

#### Strengths

- Several governors were involved which prompted state-level action and helped ensure state interests were addressed
- Focused attention on the goal of no net loss of wetlands

#### Weakness

- The Forum was an ephemeral organization with no ongoing responsibilities

### **The Nature Conservancy**

The Nature Conservancy (TNC) was the first (and now the largest) private volunteer organization dedicated to preserving the plants, animals, and natural communities that represent the diversity of life on earth through protection of the lands and waters they need to survive. Nationwide, over 740,000 members protect more than 7.6 million acres of land. In Arizona, more than 170,000 acres are protected through the support of 18,000 members and donors. Protection efforts in Arizona include ten preserves, a Public Lands Protection program, a Streams of Life campaign to protect riparian areas, and, through the Arizona Land Legacy campaign, protection plans for the San Pedro River Preserve.

TNC utilizes four primary conservation techniques:

- Land acquisition: purchases lands, such as the Mile High in Ramsey Canyon, that often include riparian areas because they are habitat for threatened and endangered species.
- Heritage program (not the same as the Heritage Fund in Arizona) which identifies the location and inventory of threatened and endangered species and the natural communities which they support. In Arizona the heritage program was begun by TNC and now forms the nongame management bank under the responsibility of the AGFD nongame branch.
- Private initiatives: such as conservation easements and the registry program which function as a partnership between the private land owner and TNC.
- Acquisition of prime habitat in cooperation with local, state and federal agencies. For instance, Bingham Cienega is owned by Pima County but managed in cooperation with TNC.

#### Strengths

- Private effort with voluntary participation
- Flexible program
- Science-based and market driven
- Utilizes real estate experts and therefore is able to quickly acquire land often at less cost

#### Weaknesses

- Only voluntary
- Limited funding

### **Trout Unlimited**

An international organization, Trout Unlimited, focuses on the protection of fish and fish habitat. In doing so, it is involved in the protection of cold water riparian areas and their ecosystems. Its mission is conservation first, with education and outreach a second priority. Trout

Unlimited is active in lobbying and employs both lobbyists and lawyers. Sportfishing is important to Arizona's economy, contributing over \$400 million annually. Trout Unlimited has approximately 800 members in Arizona, active in such restoration projects as Canyon Creek and the West Fork of the Black River. The Arizona chapters also promote quality recreational (catch and release) angling and fisheries in the state.

#### Strengths

- Labor intensive group, able to implement riparian conservation projects
- Promotes volunteerism
- Enables individuals to improve and protect valuable resources

#### Weakness

- Not as politically influential as other users of riparian areas

#### **Verde River Watershed Association**

The Verde River Watershed Association was formed to provide follow-up for the Verde River Corridor Study. Its stated goals are to preserve and protect the Verde River and its watershed, by means of local initiative and control, while using its water resources in a sustainable productive way, avoiding long-term damage or loss of productivity through use or overuse. Membership includes individuals, city, town, county and state and federal agency representatives. The association works to accomplish goals through education, cooperation and consensus.

#### Strength

- Local people working together to protect the river

#### Weaknesses

- No enforcement authority -- voluntary
- Limited funding

#### **West Fork of the Black River Watershed and Fisheries Restoration Project**

A multi-agency cooperative effort designed to preserve and recover the federally threatened native Apache trout and its habitat, the enhance brown trout recreational fishing, and to provide access to a variety of users.

#### Strength

- Uses ecosystem approach to riparian habitat improvement.
- Funding provided from federal and state agencies and private organizations.
- Local community involved.

#### Weakness

- Relatively new project.

## REGULATORY PROGRAMS IN OTHER STATES

The discussion of other state regulatory programs focuses primarily on information from five selected western state programs as presented in thesis research (Coltman 1994). Information about other state programs was also compiled from the ADEQ, AGFD, and ADWR reports; other reports and material provided by the RAAC; and additional sources as referenced. As in previous chapters, federal programs are presented first, followed by state, and then local regulations. It should be noted that federal regulatory programs applicable to Arizona as well as to other states are presented in this chapter. As discussed in the Introduction, the RATS is concurrently preparing a document of existing regulatory programs in Arizona, which also includes federal programs, resulting in some overlap of these two reports. Information about local regulatory strategies in other state riparian and wetland protection programs was limited and as a result, not presented in detail.

Initially, the discussion on other state programs was limited to the five states discussed in the thesis literature, namely, Colorado, Idaho, Montana, Washington, and Wyoming. Requests from the RAAC for information about programs in adjacent states expanded the survey to include California, Nevada, New Mexico, and Utah. (As a group, these states were not part of the thesis research due to their limited wetlands/riparian protection efforts or unsuccessful attempts to obtain information from certain state agencies.) Additional information from the three Arizona agency reports and information provided by the RAAC resulted in a survey of the following 21 states: California, Colorado, Connecticut, Florida, Idaho, Kansas, Massachusetts, Michigan, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Dakota, Oklahoma, Oregon, Texas, Utah, Virginia, Washington, and Wyoming.

Table 4 provides an overview and comparison of all 50 states wetlands and riparian protection program components in terms of their regulatory and nonregulatory strategies. The major regulatory approaches used by states include: involvement in the federal 404 program; implementation of 401 certification; numeric, narrative, and antidegradation standards; natural resource protection programs; and best management practice programs. One state, Michigan, has assumed the 404 program from the federal government. Some of the major nonregulatory efforts undertaken by states include: executive orders, tax incentives, easements, recognition programs, subsidies, technical assistance, wetland acquisition programs, and the addition of riparian and wetland areas to definitions of waters of the state.

Table 4.

Summary of State Programs (Steiner et al. 1994, p. 197)

State	Regulatory						Nonregulatory			
	Assumption of 404 programs by state	Involvement in federal 404 programs	Implementation of 401 certification	Numeric, narrative, or antidegradation standards	Other natural resource protection programs	Mandatory or voluntary best management practices	Executive order for wetland protection	Nonregulatory programs: tax incentives, easements recognition programs, subsidies, technical assistance	Wetland acquisition programs	Riparian and wetlands in definition of waters of state
Alabama	N	Y	Y	N	Y	M	N	O	N	O
Alaska	N	Y	Y	N	Y	M,V	N	T,E,S	N	N
Arizona	N	Y	Y	Y	Y	M,V	Y	E,R,TA	Y	Y
Arkansas	N	Y	Y	N	N	O	N	T,E,S	N	Y
California	N	Y	Y	N	Y	M	N	R	O	N
Colorado	N	Y	Y	N	N	O	N	R	N	N
Connecticut	N	Y	Y	N	Y	M	N	T,R,S,TA	N	Y
Delaware	N	Y	Y	O	Y	O	N	O	O	O
Florida	N	Y	Y	N	Y	M	N	R	Y	Y
Georgia	N	Y	N	O	N	M	N	E,S	Y	Y
Hawaii	N	Y	Y	Y	Y	M	N	E	Y	Y
Idaho	N	Y	Y	N	Y	M,V	N	R,S,TA	Y	Y
Illinois	N	Y	Y	Y	Y	O	N	E,S,TA	Y	Y
Indiana	N	Y	Y	Y	N	O	N	S,TA	N	O
Iowa	N	Y	Y	Y	N	O	N	T,R,S,TA	Y	O
Kansas	N	Y	Y	N	Y	M	N	E,TA	N	Y
Kentucky	N	Y	Y	N	Y	O	N	E,R,TA	Y	Y
Louisiana	N	Y	Y	N	Y	O	N	O	N	Y
Maine	N	Y	Y	N	Y	M	N	E,S,TA	N	Y
Maryland	N	Y	Y	N	Y	M,V	N	E,S,TA	Y	Y
Massachusetts	N	Y	Y	N	Y	O	N	TA	N	Y
Michigan	Y	Y	Y	Y	Y	O	N	E,TA	Y	Y
Minnesota	N	Y	Y	Y	N	O	Y	E,R,S,TA	Y	Y
Mississippi	N	Y	Y	N	Y	O	N	O	N	Y
Missouri	N	Y	Y	Y	N	M	N	E,S,TA	Y	Y
Montana	N	Y	Y	N	N	M,V	N	S,TA	Y	Y
Nebraska	N	Y	Y	Y	N	M,V	N	T,E,S,TA	Y	Y
Nevada	N	Y	Y	Y	N	M,V	N	T,E,S,TA	N	N
New Hampshire	N	Y	Y	O	Y	M,V	N	T,E,S,TA	Y	Y
New Jersey	N	O	O	O	O	O	O	O	O	O
New Mexico	N	Y	Y	N	N	M	N	O	O	N
New York	N	Y	Y	Y	Y	O	Y	T,S	N	Y
North Carolina	N	Y	Y	N	Y	O	N	T,S	N	N
North Dakota	N	Y	Y	N	N	M,V	N	TA	N	Y
Ohio	N	Y	Y	Y	N	O	Y	E,TA	Y	Y
Oklahoma	N	Y	Y	N	N	M	N	S,TA	N	N
Oregon	N	Y	Y	N	Y	O	N	T,E,S,TA	N	Y
Pennsylvania	N	Y	Y	Y	Y	M,V	N	T,E,S,TA	N	Y
Rhode Island	N	Y	Y	N	Y	M,V	N	T,E	Y	Y
South Carolina	N	Y	Y	N	Y	M,V	N	O	N	Y
South Dakota	N	Y	Y	N	N	O	N	O	N	O
Tennessee	N	Y	Y	Y	N	M	Y	E,S,TA	Y	Y
Texas	N	Y	Y	Y	N	O	N	O	N	Y
Utah	N	O	O	O	O	O	O	O	O	O
Vermont	N	O	O	O	O	O	O	O	O	O
Virginia	N	O	O	O	O	O	O	O	O	O
Washington	N	Y	Y	Y	Y	M,V	Y	TA	Y	Y
West Virginia	N	Y	Y	Y	N	M,V	N	TA	Y	Y
Wisconsin	N	Y	Y	Y	Y	M,V	N	R,S,TA	Y	Y
Wyoming	N	Y	Y	Y	N	V	Y	TA	Y	O

\*N = no, Y = yes. M = mandatory, V = voluntary, T = tax incentives, E = easements, R = recognition programs, S = subsidies. TA = technical assistance and education, O = no data.



## STATE PROGRAMS

States are currently "displaying the greatest initiative in wetlands policy and a conviction that wetlands are vital to their economic and ecological health" (WWF 1992, p. 1). The creative and flexible solutions which other states have initiated for wetlands protection may serve as examples for the RAAC in considering riparian protection strategies for Arizona. Regulatory approaches in the other states examined include permit programs for specified activities or within a geographical area mitigation banks, water quality standards, state environmental protection acts, and specific natural resource protection acts.

### California

California adopted a mitigation bank statute in 1991, but mitigation banks have not been established due to lack of funding (Kusler et al. 1993, p. 55).

#### California's Coastal Zone Protection Act

California's Coastal Zone Protection Act is its most significant effort towards wetlands protection according to Want (1993). Six regional commissions regulate freshwater and tidal wetlands within the defined coastal zone (Kusler et al. 1993, p. 51). In most cases this area occurs 1,000 yards above mean high tide. Nearly all activities within the coastal zone are regulated, with exemptions for dredging, and filling or dredging associated with coastal dependent facilities and existing navigation facilities (Kusler et al. 1993, p. 51). Before a permit is authorized, the applicant must demonstrate "that there is not a feasible less damaging alternative, that measures will be taken to minimize impacts, and that the functional capability of the wetland is maintained or enhanced" (Kusler et al. 1993, p. 52).

#### California Environmental Quality Act

All applications for water rights must comply with the California Environmental Quality Act (CEQA). An application may be reviewed by the Water Resources Control Board or assigned to another "lead agency" which performs the initial studies. The application may be exempt from CEQA or require an environmental impact report. The result of this report may be to modify the project to mitigate impacts to riparian areas. Additionally, this act requires all state agencies to review and avoid or mitigate development impacts on wetlands (Want 1990).

#### The California Coastal Conservancy

The California Coastal Conservancy, established by the state legislature in 1976, was empowered to implement restoration and enhancement programs within the coastal zone. This agency has worked to develop innovative mitigation approaches, including pilot mitigation bank programs in San Francisco Bay and Humboldt Bay, as options for permit applicants (Leslie 1990, p. 178). This agency utilizes nonregulatory initiatives to acquire and restore coastal environments (Kusler et al. 1993, p. 51). It provides land trusts with technical and financial assistance for wetlands protection (WWF, 1992).

#### California Fish and Game Code

California Fish and Game Code authorizes the California Department of Fish and Game to regulate construction projects that affect all rivers, streams, or lakes (as designated by the department, and including intermittent flows of water in these bodies) through a permit system.

Through a statute adopted in 1991, the Department of Fish and Game was directed to survey

state-owned wetlands and nonwetlands over a 100-acre area to identify areas suitable for mitigation sites to compensate for wetland losses caused by state construction projects (Kusler et al. 1993, p. 29). California is developing guidelines for this process, entitled, "Guidelines for the Establishment and Use of Mitigation Banks."

#### California Wetlands Conservation Policy

Governor Wilson issued his California Wetlands Conservation Policy and Executive Order on August 23, 1993. The plan will have California inventory their wetlands, identify crucial wetlands, develop a state strategy for planning for wetlands protection and restoration, and take a vital role in overall wetlands regulation. The California Resources Agency is the lead agency for implementing the plan.

#### Surface Water and Groundwater Regulation

According to Tellman (1994), surface water rights in California are not protected from groundwater pumping because there is no coordinated management of groundwater and surface water. Additionally, there are no provisions to protect senior groundwater pumpers from harm from other groundwater pumpers (Tellman 1994).

In California, "only groundwater directly under a stream or its banks is considered connected to surface water and susceptible to regulation as surface water" (Tellman 1994, p. 10). Groundwater identified in "underground streams" is distinct from other types of groundwater and is regulated as surface water and subject to appropriation (Tellman 1994).

California does not have a permit system for pumping groundwater. In California, the right to pump groundwater goes with the land ownership as long as that water is "beneficially used" (Tellman 1994, p. 18). Surface water is primarily regulated under the appropriation doctrine. Groundwater is only regulated if it is considered a subterranean stream or the underflow of surface streams. Otherwise, there is no system to regulate groundwater depletions (Tellman 1994, p. 22).

California does not grant instream flow permits, although instream flow preservation may be a condition of a surface water right (Tellman 1994, p.22).

#### **Colorado**

Colorado does not have a specific goal to protect wetlands or riparian areas nor has it established an objective for "no net loss" and "net gain." Although a state wetlands policy is lacking, a number of individual and cooperative actions have been taken to protect wetlands, including local governmental efforts to identify and preserve wetlands. The Colorado Division of Wildlife (CDOW) is working with the USFWS to complete the National Wetlands Inventory and state agencies are working with the SCS in its inventory on private lands. Artificially created wetlands, remediation, and restoration of riparian and wetland areas is promoted through the Colorado Riparian Association, information and education efforts, interagency efforts, and research. Restoration projects are accomplished through the CWA NPS Section 319 program.

Colorado Department of Health's Water Quality Control Division (CWQCD) is responsible for state programs authorized by the Colorado Water Quality Control Act. Through this act, the CWQCD administers the CWA Section 401 certification and 402 permits. The Corps and CWQCD issue joint public notices for 404 permits and 401 certification. State agencies are working with the Corps and EPA in the 404 permitting process. Indirect protection of wetlands may result from Colorado's law concerning instream flow and prior appropriation of water. Created in 1973, Colorado's Instream Flow Program (Senate Bill 97) preserves minimum natural stream flows and lake levels "to protect the natural environment to a reasonable degree," but as yet it has not been applied to the protection of wetlands or riparian areas. Colorado's prior appropriation of water uses

also does not consider wetlands values. The Colorado legislature authorized state appropriation of water for minimum flows in order to preserve the environment to a reasonable degree (Tellman 1994, p. 44). The state may obtain instream flow rights either through appropriation or through donation to the state. According to Tellman, over 7,300 miles of streams and rivers, mostly in the mountainous regions of Colorado, are protected through instream rights (1994, p. 44).

#### Senate Bill 40 (SB 40) Wildlife Certification

Colorado Department of Natural Resources (CDNR) is responsible for protecting and preserving fish and wildlife resources from state agency actions when the proposed activity is in or adjacent to streams. Senate Bill 40 (SB 40) Wildlife Certification is granted by the CDOW for activities that may obstruct, damage, diminish, destroy, change, modify, or vary the natural existing shape and form of any stream or its banks or tributaries (Senate Bill 40 1969). The jurisdictional area includes "the streambed, its immediate banks and as much of the bankside (riparian) areas as could reasonably be expected to contribute to the quality of the general stream habitat...to help mitigate the impacts of highway projects on fish and wildlife" (Senate Bill 40 1969). SB 40 was primarily used to protect trout streams, but a more comprehensive interpretation was advanced in the 1980s to include other streams which provide habitat for all aquatic species and wildlife. Additionally, a Memorandum of Agreement (MOA) was signed in November 1990 by representatives from the CDNR and Colorado Department of Highways regarding the SB 40 Wildlife Certification.

#### Resource Mitigation Banking Act

In 1991 the Colorado General Assembly passed the Resource Mitigation Banking Act (Senate Bill 91-120) which gave the state a broad opportunity to develop a mitigation bank addressing wetland issues, among others. Its purpose is to encourage resource conservation, enhancement, and preservation rather than necessarily requiring that mitigation occur at or near the site of resource impacts. "Resources," as defined in this act, means natural resources which may be considered under a governmental permitting process where mitigation may be required as well as any public recreation which may be involved in such a permitting process. Maintaining the bank is the responsibility of the CDNR which would involve review and approval of mitigation proposals and recording of debits and credits. The sale of mitigation credits would be allowed under this act. But due to fiscal constraints, no funding has been provided for this program.

#### Colorado Wildlife Commission Mitigation Policy

A mitigation policy (Policy No. A-6) has been developed by the Colorado Wildlife Commission that establishes procedures and guidelines for mitigation of impacts from a specified list of activities. This list includes federal 404 permits and 401 certifications, hydropower permits and licenses, right-of way grants, and SB 40 wildlife certifications, among others.

According to Kusler and others, states have had limited experience with mitigation banks. The experience thus far suggests the potential for more successful mitigation projects than in the past, and perhaps less costly opportunities than on-site mitigation (Kusler et al. 1993, p. 31).

Drawbacks of mitigation banks include: the loss of site-specific wetlands functions and values; off-site mitigation may pose private and public legal liability due to impacts from the proposed project on neighboring areas; essentially creating opportunities for "buying" wetlands permits; problems with monitoring and enforcing mitigation projects; and increasing the likelihood that applicants for permits would choose mitigation over possibly more appropriate on-site opportunities.

### Inland Wetlands and Watercourses Act

Specific activities are regulated within inland wetlands and watercourses. These include: removal or deposition of material, obstruction, construction, alteration, or pollution of wetlands or watercourses. Exemptions pertain to specific "agricultural uses, construction and maintenance of water supply systems, certain conservation and recreation uses, and enjoyment and maintenance of residential property" (Kusler et al. 1993, p. 57).

### Surface Water and Groundwater Regulation

In Colorado, groundwater and surface water are regulated under separate systems, but these systems are integrated "so that permits for one type of water may be reviewed for their impacts on other types of water" (Tellman 1994, p. 41). According to Colorado state law, "it is the policy of this state to integrate the appropriation, use, and administration of underground water tributary to a stream with the use of surface water in such a way as to maximize the beneficial use of all of the waters of this state..." (Tellman 1994, p. 43). All water is considered public and therefore subject to appropriation. It is the method of appropriation of its surface water that sets Colorado apart from other western states (Tellman 1994).

Surface water is managed through a court adjudication system, while permits are required for wells, except for nontributary groundwater. Tellman reports that these "two allocation systems are integrated so that impacts on one type of water may affect granting of rights to another type of water" (1994, p. 41). This method of coordinated management is to "take into account preserving water levels for minimum stream flows and natural lake levels" (Tellman 1994, p. 43). Water rights may be bought, sold, and transferred in Colorado. Additionally, substitutions may be made between surface and groundwater supplies by the same rights holder (Tellman 1994, p. 43).

## **Connecticut**

### Inland Wetlands and Watercourses Act

The intent of this law is "the preservation and protection of wetlands and watercourses from random, unnecessary, undesirable and unregulated uses, disturbances or destruction is in the public interest and is essential to the health, welfare and safety of the citizens of the state" (Water Resources Unit 1989, p.1). It regulates filling, dredging, building, obstructing, or polluting a wetland or watercourse.

According to Salvesen, "Connecticut's coastal wetlands law is so strict that it does not need a mitigation policy; since 1969, only about five acres of coastal wetlands have been filled" (1990, p. 50).

## **Florida**

Through its water quality program, Florida has adopted special standards for the discharge of treated stormwater and waste water into wetlands (Kusler et al. 1993, p. 63).

### Critical Area Designation

The WWF (1992) reports that Florida has an aggressive acquisition program for wetlands and other sensitive areas. Big Cypress and other extensive wetland areas are protected through legislation that authorizes the designation of "critical areas."

### Outstanding Florida Waters

Certain waters may be designated as "Outstanding Florida Waters" which receive additional protection from water quality degradation, and applicants must show that the project is clearly in the public interest (Want 1990). Mitigation may be proposed to offset negative impacts that otherwise

would not make a permit possible. As a general rule, the ratio of 2:1 is used for wetlands creation, although wetlands restoration or enhancement is preferred over creation efforts.

#### Wetlands Protection Act of 1984

Alteration of wetlands that are contiguous with a water body (isolated wetlands are not regulated) requires a permit from either local water districts or the Department of Environmental Regulation. "Alteration" includes the construction and installation of structures, and the dredging or filling of waters. Certain exemptions apply.

The Department of Environmental Regulation is the lead agency for reviewing dredge and fill permits required for activities in both fresh and salt waters of the state, including associated wetlands (Want 1990). These permit applications also serve as joint applications for a concurrent review by the Florida Department of Natural Resources and the Corps. The Department of Environmental Regulation has also delegated some of its permit review authority to regional water districts.

In Florida, state statutes mandate a permit data management system for the 404 permits. State officials are required to make an annual report to the Florida legislature to identify losses and gains of wetlands.

#### Minimum Flows

Florida state statute requires that minimum seasonal flows and levels of surface watercourses be established to protect natural resources, marine, estuarine, and aquatic ecosystems. The requirements to maintain minimum flow levels form the basis for establishing water supply programs that provide sufficient water to meet the needs of all reasonable-beneficial uses that are in the public interest, as long as these programs safeguard the environment and protect water quality (ADWR 1994d, p. 5-30).

#### Water Resources Goal

The overall water resources goal, as stated in Florida's State Comprehensive Plan, is as follows:

Florida shall assure the availability of an adequate supply of water for all competing uses deemed reasonable and beneficial and shall maintain the functions of natural systems and the overall present level of surface and groundwater quality. Florida shall improve and restore the quality of waters not presently meeting water quality standards (ADWR 1994d, p. 5-31, citing Florida Statutes, Chapter 187.201).

Districts are developing regional and sub-regional plans to meet the overall water resources goals stated above. These plans guide decisions regarding water use permits, construction management, purchase of environmentally sensitive lands, operations of flood control and water supply reservoirs and control structures, and monitoring activities to assess the effectiveness of the regional or sub-regional water supply plans (ADWR 1994d, p. 5-31).

#### Florida Coastal Management Program

The Department of Natural Resources (Division of Beaches and Shores) regulates construction permits for "erosion control devices and for excavations or erections of structures at any coastal location" (Want 1990, p. 13-29).

#### Mitigation Banking

According to Salvesen, Florida usually does not allow off-site mitigation, but it does allow "preconstruction mitigation," that is, mitigation banking. In addition, every mitigation project in

Florida above one-tenth of an acre must be put into a perpetual conservation easement to ensure that the mitigated site itself will not be the site of future development" (1990, p. 50).

Florida uses a sliding scale of ratios for mitigation. The ratios vary with each project depending on the likelihood of success, geographic location, and whether wetlands will be created, enhanced, or preserved (Salvesen 1990). For creation, ratios range from 1:1 to 6:1, for enhancement 4:1 to 20:1, and for preservation 10:1 to 100:1 in Florida.

In 1990 the legislature directed the Department of Environmental Regulation to undertake a study of its wetlands mitigation policy in response to many reports of significant problems in implementation (WWF 1992). Findings from this study identified thousands of acres of wetlands lost due to unsuccessful mitigation projects and development of wetlands that were previously created as mitigation for other development projects (WWF 1992). This study accentuated the need for periodic monitoring and evaluation of mitigation projects.

## **Idaho**

Some measure of protection to wetlands and riparian areas in Idaho is provided by the Stream Channel Protection Act, 401 water quality certification, the Idaho Lake Protection Act, as well as a mitigation bank developed to offset impacts to wetlands as a result of highway construction or maintenance activities.

### State Agricultural Water Quality Program

Specific goals for the protection of riparian areas or wetlands in Idaho are currently being developed as part of the State Agricultural Water Quality Program. As yet, no objectives for "no net loss" or "net gain" have been established. A riparian area has been defined as that area within 100 feet of the MHW mark of a waterway. A distinction between riparian areas and wetlands is planned in an update of the Agricultural Water Pollution Abatement Plan. A statewide inventory based upon the USFWS National Wetlands Inventory has not been updated at this time, although the Idaho State Parks and Recreation Department has a priority wetlands list. Artificially created wetlands, as well as remediation and restoration of riparian areas and wetlands, are promoted through the implementation of the State Agricultural Water Quality Program and the Clean Lakes Program.

In Idaho, water quality standards, wastewater treatment requirements, and special resource water requirements are considered in determining water quality certification. Idaho is in the process of developing 401 certification regulations. All construction in Idaho shall be conducted during low-flow periods and all areas disturbed by construction shall be stabilized with physical and/or vegetation methods to ensure erosion protection.

### Stream Channel Protection Act

An important component of Idaho's regulatory approaches to wetlands and riparian protection is the Stream Channel Protection Act. It is administered by the Idaho Department of Water Resources and requires a permit for most stream alterations including those involving operation of machinery within the stream. These requirements do not apply to intermittent streams. When a federal 404 and a stream channel alteration permit are both required, these permits are processed through a joint application but dual permits are issued. On-site mitigation is required, with monitoring for three to five years. A memorandum of agreement (MOA) has been established among four state agencies for coordinating comments on 404 permits.

### Lake Protection Act

Through Idaho's Lake Protection Act (Idaho Code Section 58-144), permits are required for encroachment on or above beds of navigable lakes. Encroachments are defined to include docks,

piers, pilings, channels or basins, landfills, and other similar structures. Among the interests to be protected under this act are water quality, protection of property, navigation, fish and wildlife habitat, aquatic recreation, and aesthetic beauty. Permits are administered by Idaho's Department of Lands.

#### Mitigation Bank

A mitigation bank was established in 1987 by the Idaho Department of Transportation to compensate for unavoidable impacts to wetlands due to its roadway development and maintenance activities. The mitigation bank represents a net gain of wetlands created, restored, or enhanced to be drawn against to offset losses from highway related activities that otherwise comply with the CWA requirements. A detailed description of operating procedures for the development and use of a wetland bank in Idaho has been developed by an interagency wetland banking team.

In Idaho the development of water banking practices promotes the efficient use of water under the appropriation doctrine. In most other states there are no incentives for conserving water since any water saved could be reallocated to another person without any benefit to the one who conserved this resource (Tellman 1994).

#### Surface Water and Groundwater Regulation

According to Tellman (1994), unified management and protection of groundwater and surface water occurs where there is evidence of a hydrologic connection between ground and surface water. In 1978 a law was passed which codified instream flow rights and established that only the Water Resource Board could apply for such a right. Although the Board may be requested to act on behalf of others, an instream flow right is subject to legislative veto (Tellman 1994, p. 46). Protection of minimum stream flow is accomplished through Idaho statute (it requires preservation of minimum stream flows for specific uses and goals) and through the appropriation system.

#### **Kansas**

Kansas addresses the definition of riparian areas through its statewide water plan as vegetation and associated wildlife areas and 401 regulations are contained within the state's water quality standards.

#### Water Resources Planning Act

The goal to protect wetlands and riparian areas is part of a comprehensive water planning effort. The Water Resources Planning Act directs the Kansas Water Office to "...formulate on a continuing basis a comprehensive state water plan for the management, conservation and development of the water resources of the state" (KSA 821-901 et seq.).

The identification of riparian and wetland areas is accomplished through the state comprehensive planning process. In 1986, riparian protection and wetland protection subsections were included in the Kansas Water Plan as part of the fish, wildlife, and recreation section of the plan. Riparian areas and wetlands are defined in the water plan and their values recognized (ADWR 1994d).

#### Kansas Wetlands/Riparian Protection Program

Conservation districts identify high priority wetlands and riparian areas and develop conservation plans for these resources (Kusler et al. 1993, p. 79). The Department of Wildlife and Parks may acquire wetland/riparian easements.

### Wetland and Riparian Areas Project

Funded by EPA, Kansas recently completed the Wetland and Riparian Areas Project (WRAP), a cooperative effort involving federal, state, and private entities for the purpose of addressing conservation issues relating to wetland and riparian areas in Kansas. A primary goal of the project was to provide pertinent information regarding wetland and riparian resources to government agencies, private organizations, and the general public (ADWR 1994d, p. 5-28, citing Kansas Department of Water Resources, 1993).

### Surface Water and Groundwater Regulation

Initially, surface water and groundwater were managed separately and under different systems. In 1886, the Kansas legislature passed the first water law that established appropriation of surface water (Tellman 1994). Later, in 1945, all waters of the state came under appropriation. Every appropriation right is subject to any minimum desirable streamflows established for specific streams.

Kansas now has a unified appropriation system for managing groundwater and surface water rights allows for equal protection of surface water rights from pumping as from stream diversion (Tellman 1994). There is no distinction made between water above or beneath the surface of the ground. All types of water are thought to be owned by the public (Tellman 1994).

"Groundwater Use Control Areas" have been established which can be closed to all new surface or groundwater appropriations under its Groundwater Management District Act (Tellman 1994). Additionally, the state engineer can withhold appropriations for rivers with designated minimum stream flows as approved by the legislature (Tellman 1994).

### **Massachusetts**

Wetlands protection is linked to water quality, where the purpose of water quality standards is "to protect the public health and enhance the quality and value of the water resources of the Commonwealth" (314 CMR 4.0 1(4)).

According to the World Wildlife Fund (1992), Massachusetts was the first state to adopt a wetlands protection statute. Wetlands are being mapped statewide and those property owners with wetlands on their lands are being notified of their location and any restrictions.

### Wetlands Protection Act

The Massachusetts Wetlands Protection Act regulates the filling, dredging, and altering of wetlands. According to Klein and Freed (1989, p. 500), "Protected wetlands, also referred to as resource areas, include banks, freshwater wetlands, coastal wetlands, beaches, dunes, flats, marshes, meadows and swamps. To be protected under the act, these resource areas must border a body of water. ...[A]ny activity within 100 feet of the edge of most wetlands is also subject to regulation." No person may remove, fill, dredge, or alter a wetland without first obtaining an order of conditions

The Massachusetts Department of Environmental Protection houses the Wetlands Protection Program which implements this act. It determines the regulations governing the local conservation commission review of wetlands projects as well as reviewing the local orders of conditions. The permitting authority has been delegated from the state to these local conservation commissions, and in their absence, to a mayor of a city or selectmen in towns (Want 1990).

The strengths of the act are it can prohibit specific activities, can be enforced, can provide flexibility, and can promote specific uses of land. The act's weaknesses are it may require extensive funding and resources for implementation and enforcement, may not include all valuable wetlands or exclude all activities harmful to wetlands, may often be reactive, may be politically unpopular due to impositions on private activities, and may incur takings challenges.



### Wetlands Restriction Act

Wetlands are mapped and "restriction orders" are placed on affected wetlands by the Massachusetts Department of Environmental Protection. Massachusetts employs a ranking system in its state wetlands program, which in effect assigns wetlands to two broad classes. According to Haygood and Reed, the Massachusetts

Inland Wetlands Restrictions Act and the Coastal Wetlands Restrictions Act, wetlands are mapped on a town-by-town basis. Those wetlands identified as particularly valuable are designated for restriction. Following a public hearing, a Restriction Order is enacted which prohibits certain activities which would harm the wetlands. The Order is recorded on the deed of the property to give notice of the restriction to future purchasers of the property (1990, pp. 52-53).

The inland wetlands regulations pertain to activities on "banks and beaches, bordering vegetated wetlands, lands under waterbodies and waterways, and land subject to flooding"...while coastal wetlands regulations pertain to activities "in port areas, coastal beaches, coastal dunes, barrier beaches, coastal banks, rocky intertidal shores, salt marshes, land under salt ponds, and land important to fisheries" (Want 1990, p. 13-58). Additionally, these regulations are a benefit to landowners by identifying wetlands in advance of permit applications.

According to Kusler et al. (1994), approximately 46,000 acres of coastal wetlands and 8,000 acres of inland wetlands are currently protected by these wetland restrictive orders. Violations of the Wetlands Protection Act may result in criminal penalties and imprisonment or both. The act also provides for civil penalties.

### Massachusetts Coastal Zone Management Act

The Massachusetts Coastal Zone Management Act requires all agencies within the Executive Office of Environmental Affairs to "conform their regulations, administrative procedures, standards, and criteria to the policies contained in the Coastal Zone Management Regulations" (Want 1990, p. 13062). Thirteen policy statements are contained within these regulations and include requirements for the protection of ecologically significant resource areas. This act does not regulate any specific activities, but serves as a coordinating mechanism for all agencies within the Executive Office of Environmental Affairs.

### Public Waterfront Act

Based on the public trust doctrine, the goal of this act is to preserve, protect, and promote public rights (access, fishing, fowling, and navigation) in tidelands, former tidelands, great ponds, and certain rivers and streams by regulating specific activities in these areas. Activities such as construction, dredging, and filling are regulated to ensure that tidelands are used only for water-dependent activities or otherwise serve the public interest (Kusler et al. 1993, p. 93). It is interesting to note that these areas, even if privately owned, are held in the public trust and are under regulation (Want 1990). The act is implemented through the Massachusetts Department of Environmental Protection.

### Mitigation

Massachusetts' wetlands laws specify the type of plants and the amount of plant cover required at mitigation sites: at least 75 percent of the surface area of the replacement area must be established with native plants (Salvesen 1990, p. 50).

### **Michigan**

Michigan has assumed the federal Section 404 program and "uses a combination of shoreline zoning, wetland regulation, and lake protection and management to protect wetlands (WWF 1992,

p. 3). Michigan's wetlands goal is to increase the acreage of state wetlands by a minimum of 500,000 acres by the year 2000 (WWF 1992, p. 13).

#### Goemaere-Anderson Wetlands Protection Act of 1979

The cornerstone of Michigan's wetland protection is the Goemaere-Anderson Wetlands Protection Act of 1979, which was approved by the governor on 3 January 1980. The act provides "for the preservation, management, protection, and use of wetlands; to require permits to alter certain wetlands; to provide for a plan for the preservation, management, protection, and use of wetlands, and to provide remedies and penalties" (Michigan, State of, 80th Legislature, 1979, Act No. 203). This act provides a clear definition of wetlands and is made up of two components. First, Act 203 only regulates wetlands "where water (surface or subsurface) is present at a frequency and duration sufficient to support wetland vegetation or aquatic life" (Brown 1988, p. 6). Second, "wetlands are separated according to whether or not they are contiguous to a water body" (Brown 1988, pp. 6-7; Steiner et al. 1991a). Most activities in contiguous wetlands and in isolated wetlands over five acres in size must obtain a permit from the Michigan Department of Natural Resources (MDNR).

Administrative rules for this act defines mitigation practices, following the sequence of avoid, minimize, and then mitigate. Compensation is used to offset unavoidable impacts when following this sequence. On-site mitigation is preferred, although off-site within a municipality or watershed is acceptable, and elsewhere only as a last resort. No net loss of wetlands must be a part of the mitigation proposal (Kusler et al. 1993, p. 99).

Under this act, the following actions are prohibited without a permit: depositing or allowing the placement of fill; dredging, removing, or allowing the removal of soil or materials; constructing, operating or maintaining any use or development; and draining surface water (Want 1990, p. 13-65).

#### State 404 Program

Thus far, Michigan is the only state with both a sufficiently strict program and the inclination to assume administration of the federal Section 404 permit program within its borders. Michigan assumed administration of the Section 404 wetlands program in August 1984. But the Corps has retained jurisdiction over Section 10 of the RHA of 1899 and "Section 404 activities in and adjacent to the Great Lakes, their connecting waterways, wetlands adjacent to navigable rivers, and the mouths of major tributaries of navigable rivers" (Brown 1988, p. 9; Steiner et al. 1991a, p. 35). A permit is required from the Michigan Department of Natural Resources for dredging, filling, draining, and developments, with certain exemptions.

The MDNR evaluates permit applications according to Act 203, which stipulates "a permit...shall not be approved unless the department determines that the issuance of a permit is in the public interest, that the permit is necessary to realize the benefits derived from the activity, and that the activity is otherwise lawful." The permit shall not be issued unless the applicant demonstrates that the "proposed activity is primarily dependent upon being located in the wetland" and "a feasible and prudent alternative does not exist."

In addition to specific permits, the MDNR "may issue general permits on a state or county basis for a category of activities that are similar in nature and have only a minimal adverse effect, both individually and cumulatively, on the environment" (Brown 1988, p. 7). The MDNR's Land and Water Management Division is responsible for the administration of the permit program. Act 203 also strengthens local protection efforts. An applicant may also need to request a permit with a local government if it has adopted a wetlands ordinance. The permit program is enforced through strong civil and criminal penalties of up to \$50,000 per day of violation and up to two years in prison. The act also authorizes municipalities to provide "more stringent definition and regulation

of wetlands" in local wetland zoning ordinances (Brown 1988, p. 8).

Since Michigan is essentially running its own 404 program, permit applications must go through a type of public interest review similar to that which the Corps performs and must meet tests similar to those which EPA has established, such as the water dependency and practicable alternatives test. In other words, in Michigan, a permit to develop in wetlands will be issued only if the activity is in the public interest, is "primarily dependent on being located in the wetland", or if no "feasible and prudent" alternative exists. Michigan goes a step further and also considers the amount of wetlands remaining in an area and the cumulative impacts of the proposed projects on wetlands in a particular watershed before it will issue a permit (Salvesen 1990).

#### Shorelands Protection and Management Act

This act is aimed at protecting the shorelines of the Great Lakes. Specified activities that occur in any designated environmental areas, flood risk areas, and high risk erosion areas within 1,000 feet of the Great Lakes shorelines must obtain a permit from MDNR or a local government. Within the category of environmental areas are sites important for preserving and maintaining fish and wildlife resources. These areas are primarily wetlands, but also include some islands and upland regions (Kusler et al. 1993, p. 98).

#### Inland Lakes and Stream Act

Requires a permit is required for specified activities below the ordinary high water mark of all natural or artificial inland lakes, streams, or rivers greater than five acres in size (Want 1990).

#### Soil Erosion and Sedimentation Control Act

Construction activities are regulated locally (with state oversight) in order to minimize soil erosion. In particular, earthmoving activities within 500 feet of a lake or stream are regulated (Want 1990).

### **Montana**

A statewide interagency wetlands protection program is in its infancy. Important components include the Montana Water Quality Act, the Stream Protection Act, the Natural Streambed and Land Preservation Act, the federal 401 certification program, and a mitigation policy for highway construction projects.

Riparian areas in Montana are defined in state documents while a state memorandum of understanding (MOU) refers to the federal definition for wetlands. Distinctions are made between the two depending upon the individual circumstances. Although there is no established state policy, the objective of "no net loss" is being loosely applied at present. A statewide inventory is in progress and water quality standards for wetlands are currently being developed. Montana promotes artificially created wetlands, remediation, and restoration of riparian areas and wetlands through funding and incentives.

#### Montana Water Quality Act

Regulatory approaches to wetlands and riparian area protection include the Montana Water Quality Act (75-5-101 through 641). This act created the Montana Water Quality Bureau that reviews all activities that may impact the quality of state waters, including wetlands.

Section 401 certification incorporates antidegradation standards for wetlands. Specific rules for 401 certification have been adopted. Best management practices (BMPs) or "reasonable soil and water conservation practices" are required for compliance with state water quality standards. Regulatory BMPs are enforced through the specific permitting programs, while voluntary BMPs are

encouraged through the nonpoint source (NPS) program. Typical 401 certification conditions include erosion control, the use of alternative materials, and construction monitoring.

#### Stream Protection Act

The Stream Protection Act (87-5-501) establishes a state policy in Montana for the protection and preservation of its fish and wildlife resources, especially the fishing waters within the state. This act requires all agencies of state government notify the Montana Department of Fish, Wildlife and Parks before any construction may take place that will vary the natural existing shape and form of any stream, its banks, or its tributaries.

#### Natural Streambed and Land Preservation Act

Under the Natural Streambed and Land Preservation Act (Title 75, Chapter 7), local conservation districts must approve activities for private projects that will impact the bed or banks of perennial flowing streams in accordance with state standards and rules.

#### Surface Water and Groundwater Regulation

In Montana, "water" is defined as "all waters of the state, surface and subsurface, regardless of its character or manner of occurrence, including but not limited to geothermal water, diffuse surface water, and sewage effluent," and is subject to appropriation (Tellman 1994, p. 33). There is no distinction made between water above or beneath the surface of the ground. All types of water are thought to be owned by the public. The 1973 Water Use Act mandated appropriation of water through a permit system (Tellman 1994).

Stricter rules apply in areas designated as "highly appropriated basins" and applicants for groundwater permits in these areas may have to show evidence that the source of groundwater is not connected to surface water (Tellman 1994 p. 34). Funded by a special tax, a statewide Groundwater Assessment program has been initiated which focuses on the nature and extent of groundwater problems within the state (Tellman 1994).

Limited instream flow rights were first recognized in 1969, but later invalidated through the court system because other uses were "more beneficial to the public" (Tellman 1994, p. 34). In 1973 a new instream flow law allows the Montana Water Board to reserve water for instream flow purposes, but limits it to "fifty percent of the average flow of record on gauged streams, subject to subsequent reallocation" (Tellman 1994, p. 34). Additionally, the Department of Fish, Wildlife, and Parks is allowed to lease consumptive rights for temporary conversion to instream use for specific streams due to the passage of a law in 1989 (Tellman 1994, p. 34).

#### Mitigation Banking

Mitigation banking has been established for highway construction projects.

### **Nebraska**

#### Instream Flow Permits

In Nebraska, natural resource districts and its Game and Parks Commission are required to conduct studies to identify specific stream segments which need instream flow protection. They may file for an instream flow permit to protect flows for recreation, fish, and wildlife (ADWR 1994d, p. 5-27). The director of the Department of Water Resources reviews instream appropriation applications using the following criteria:

1. The economic, social, and environmental value of the instream use or uses including, but not limited to, recreation, fish, wildlife, induced recharge for municipal water systems, and water quality maintenance.

2. The economic, social, and environmental value of water uses that will be foregone or accorded junior status (ADWR 1994d, p. 5-27, citing Surface Water, Chapter 46, Article 2, 1993).

"The Legislature also finds that proposals for future water development should fully consider multiple uses, including instream flows whether from natural flow or from reservoir releases, and recognizes the positive impact of impoundments which can provide significant instream flow benefits" (Tellman 1994, p. 23).

#### Advanced Identification Project

An ADID project covering approximately 19 counties within the Rainwater Basin was completed in 1992.

#### Mitigation Bank

A mitigation is being developed for projects of the Nebraska Department of Roads. It has been a cooperative effort of the Corps, USFWS, EPA, and the Nebraska Game and Parks Commission and the Nebraska Department of Environmental Quality (Kusler et al. 1993, p. 113).

#### Antidegradation Policy

Many states apply antidegradation water quality standards to wetlands. In Nebraska, the antidegradation policy is used with the 401 program. If fill eliminates or impairs a beneficial use of a surface water body, including wetlands, then the antidegradation clause of Nebraska Surface Water Quality Standards is violated and 401 certification is denied. Additionally, the state has adopted protected uses for wetlands (Kusler et al. 1994, p. 113).

#### Surface Water and Groundwater Regulation

In Nebraska, the appropriation of surface water rights prevails, with senior rights having priority over junior rights as long as the water is beneficially used. Groundwater, on the other hand, belongs to the overlying property owner and may be used on that land, on adjacent land, or transferred elsewhere (Tellman 1994, p. 23). Surface water rights in Nebraska are not protected from groundwater pumping because there is no coordinated management of groundwater and surface water. Although wells must be registered with the state, only in control areas are permits required (Tellman 1994, p. 23). In Nebraska, "only groundwater directly under a stream or its banks is considered connected to surface water and susceptible to regulation as surface water" (Tellman 1994, p. 10). Therefore, it is subject to appropriation.

Surface and groundwater are managed conjunctively only where wells for irrigation purposes are located within 50 feet of the bank of any natural stream, or where the wells may directly affect the surface flow of that stream. A permit from the Department of Natural Resources is required in these cases. In considering applications for such permits, the Department of Natural Resources considers the effect of pumping on the water in the stream and its ability to meet its required appropriations (Tellman 1994, p. 23). Surface water appropriations are protected from later appropriations, but not from most groundwater pumping.

#### **Nevada**

The Nevada Division of Wildlife (NDOW) is developing a wetlands conservation plan on present and future wildlife management areas, which is the first step in an initiative that will ultimately apply to all wetlands in the state. The NDOW will develop a written policy document that delineates the mechanisms to achieve a goal of no net loss of wetland by area and function and that

will act as a policy guide to NDOW in the preparation of comprehensive plans for wetlands.

#### Dredge and Fill Statute

A state statute requires permits (letters of authorization) from the State Division of Lands for dredge and fill activities in navigable waters (Kusler et al. 1993, p. 116).

#### Surface Water and Groundwater Regulation

In Nevada, there is currently no distinction made between water above or beneath the surface of the ground. All types of water are thought to be owned by the public (Tellman 1994). The state engineer is guided by the availability of unappropriated water; the effect on existing rights; and the public interest when considering applications for appropriations. The courts have also determined that protection of stream flow is "in the public interest" and an important Nevada Supreme Court decision set the tone that pumping could be limited to protect surface water rights (Tellman 1994, p. 35). Recreation and wildlife uses are recognized as beneficial uses and water may be appropriated in a stream for these purposes (Tellman 1994, p. 36).

#### New Jersey

Four primary statutes protect freshwater and tidal wetlands in New Jersey: Freshwater Wetlands Protection Act; Pinelands Protection Act; Coastal Wetlands Protection Act; and Hackensack Meadowlands Development Commission (Kusler et al. 1993, p. 120).

#### New Jersey Freshwater Protection Act of 1987

This act requires a permit from the New Jersey Department of Environmental Protection and Energy for regulated activities within freshwater wetlands and adjacent buffer (riparian) areas. Regulated activities include fills, excavation drainage, and disturbance of wetland vegetation. Specific exemptions exist, primarily for activities associated with farming and forestry (Kusler et al. 1993, p. 120). According to Kusler et al. (1993), this act and its associated rules established three categories of wetlands. These categories establish specific buffer zones (150 feet for "exceptional wetlands"; 50 feet for "intermediate wetlands"; and no buffer for "ordinary wetlands"). Wetlands are classified on a case-by-case basis. A permit is required for regulated activities in freshwater wetlands and adjacent buffer zones (Kusler et al. 1993, p. 120).

Want (1990, p. 13-76.1) notes that since the New Jersey Freshwater Wetlands Protection Act "is intended to assume the federal Clean Water Act Section 404 permitting authority, the regulatory program...is in all respects consistent with or more stringent than the Section 404 permitting authority...." However, this act, in addition to the discharge of dredged and fill materials, also regulates such activities as ditching and cutting vegetation that have adverse impacts on wetland resources.

To alter a wetlands of exceptional resource value, a compelling public need for the proposed activity must be demonstrated. The New Jersey law defines the following as evidence "that would be admissible to rebut the presumption that alternatives exist to wetlands disturbance" (Meeks and Runyon 1990, p. 12). The evidence includes:

1. The basic project purpose cannot reasonably be accomplished using one or more other sites in the general region that would avoid, or result in less adverse impact on an aquatic ecosystem; and
2. That a reduction in the size, scope, configuration or density of the project as proposed and all alternative designs to that of the project as proposed that would avoid, or result in less, adverse impact on an aquatic ecosystem will not accomplish the basic purpose of the project; and

3. That in cases where the applicant has rejected alternatives to the project as proposed due to constraints such as inadequate zoning, infrastructure or parcel size, the applicant has made reasonable attempts to remove or accommodate such constraints (Meeks and Runyon 1990, p. 12; Steiner et al. 1994).

Permit fees are collected when an application is submitted. These fees are based upon the costs of administering the permit program and can be changed through administrative rule to reflect changes in cost (WWF 1992).

In 1986, New Jersey's Division of Coastal Resources adopted a mitigation policy intended to "assure no-net-loss of aquatic habitat productivity, including flora and fauna." New Jersey's Freshwater Wetlands Protection Act, enacted in July 1987, allows for mitigation and establishes a preference for on-site creation or restoration of wetlands whose ecological value equals that of wetlands to be disturbed. If on-site mitigation is not feasible, off-site mitigation and deed restriction of private property or an equivalent monetary donation to the wetlands bank created by the statute is permitted. Land donations to the wetlands mitigation bank are allowed only as a last alternative (Steiner et al. 1991a, p. 39).

#### Wetlands Mitigation Bank

New Jersey statutes established a Wetlands Mitigation Bank in 1988 that is governed by a Wetlands Mitigation Council. When on-site creation or restoration of freshwater wetlands is not feasible, then the possibilities of off-site creation or restoration of wetlands on private property is explored in consultation with EPA. No future development is allowed on these lands. Another option is a donation to the Wetlands Mitigation Bank (Kusler et al. 1993, p. 30).

#### Coastal Wetlands Protection Act

This act regulates draining, dredging, excavation, and placement of structures and other obstructions on specified lands that are subject to tidal action (Kusler et al. 1993).

#### **New Mexico**

Kusler et al. (1994, p. 123) reports that New Mexico has an "extremely limited program" for wetlands protection. Wetlands are considered "waters of the state" and therefore are protected under New Mexico's general water quality standards and an antidegradation policy.

#### Statewide Comprehensive Outdoor Recreation Plan

A state wetlands priority conservation plan was a component of the 1988 SCORP. This plan identified important wetlands and recommended their protection, but due to staffing and budget constraints, these recommendations have not been implemented (Kusler et al. 1993, p. 124).

#### Surface Water and Groundwater Regulation

There is unified management and protection of groundwater and surface water within the state of New Mexico (Tellman 1994). Surface water is regulated under the appropriation system, and water within an underground basin is also subject to appropriation for beneficial use while water outside of an underground basin is not subject to control by the state engineer (Tellman 1994). There are no statutory provisions for instream flow permits in New Mexico.

Permits are granted by the state engineer for appropriations. The applicant must show "that the proposed appropriation will not impair the existing water rights of others" (Tellman 1994, p. 48). An application for new pumping near a stream could be denied if it is shown that pumping would be damaging to that stream (Tellman 1992).

## **North Dakota**

### **No Net Loss**

According to state officials, North Dakota was apparently the first state to implement a no-net loss law in 1987 (Senate Bill 2035, chapter North Dakota Century Code). However, the bill actually is a fairly complex and delicate compromise between environmentalists and farmers. The law does clearly state that, "the public health, safety and general welfare, including without limitation, enhancement of opportunities for social and economic growth and expansion, of all the people in the state, depend in large measure upon the optimum protection, management, and wise utilization of all the water and related land resources of the state" (North Dakota State Engineer 1989, p. 1).

### **Wetlands Preservation Policy**

In North Dakota, riparian and wetland protection is addressed through a wetlands preservation policy which allows the creation of wetlands to substitute for drainage projects (ADWR 1994d, p. 5-25). The policy excludes the use of eminent domain and requires compensation to landowners and maintenance of tax bases. The minimum drainage area requiring a permit is 80 acres, and all such requests for a permit to drain land must include replacement with equal acreage of wetlands. A wetland bank is also created (ADWR 1994d, p. 5-26, citing Drainage Rules 1991).

"Permits are required from the State Water Resources Commission for activities in state waters and drainage of certain ponds, sloughs, and lakes including dikes, dams, and other channel modifications" (Kusler et al. 1993, p. 130). The term "wetland" applies to any natural depression that is capable of holding shallow, temporary, intermittent, or permanent water (Kusler et al. 1993, p. 130).

A permit is required to drain any wetland or series of wetlands with a watershed of eighty acres or more in size. Application is made to the state engineer or the water resource district where the watershed is located. At least half of the wetlands replaced must occur in the county or contiguous counties where the wetland drainage occurs (Want 1990).

### **Surface Water and Groundwater Regulation**

In North Dakota, there is no distinction made between water above or beneath the surface of the ground. All types of water are thought to be owned by the public (Tellman 1994). In the early 1900s North Dakota adopted a unified approach to water management. All water is managed under an appropriation system except for navigable streams (Tellman 1994).

In 1963 a North Dakota Supreme Court decision declared that a landowner may not transport underlying percolating water to another land not overlying the common supply of this water if taking such water would harm another landowners overlying this common supply who had applied the water to a beneficial use (Tellman 1994). Additionally, in 1968, the Court declared that landowners do not have absolute ownership of the underlying water unless it has been diverted and applied to beneficial use. Therefore, the landowner does not have rights to unused groundwater underlying his or her land (Tellman 1994).

Although North Dakota does not have a program for instream flow permits, the state may deny new appropriations if they adversely affect "fish and game resources and public recreational opportunities" (Tellman 1994, p. 38).

## **Oklahoma**

The Oklahoma Conservation Commission was designated by the legislature in 1990 as the state's lead agency for wetlands planning. The Conservation Commission, through two EPA grants, is developing a comprehensive state wetlands management plan (Kusler et al. 1993, p. 134).

Another statute requires permits for the discharge of dredge and fill material from the



Oklahoma Water Resources Board (Kusler et al. 1993, p. 134). The state has adopted a 401 water quality certification program and applies antidegradation standards to wetlands. It also has an outstanding waters program (Kusler et al. 1993, p. 134). Oklahoma's mitigation policy requires recreation of wetlands either on-site or off-site. It uses a mitigation ratio of 3:1 (Kusler et al. 1993, p. 134).

### Scenic River Areas

Oklahoma has created state funded commissions to protect, plan, and manage scenic river segments. These commissions have broad and flexible authority to develop and implement management plans (ADWR 1994d, p. 5-26). Oklahoma has established "Scenic River Areas" in statute for the purpose of preserving the state's free-flowing river and stream reaches. A Scenic River Commission is provided for each of these scenic river areas and funded by the state through the Department of Tourism and Recreation. The commission has the authority to adopt rules and management plans to guide and control private activities and public programs within the scenic river areas. It may also purchase land, take legal actions to enforce protection of the areas, and suspend the effectiveness of any action taken by a municipality or county within the designated operating area of a commission if the proposed action is adverse to the Scenic Rivers Act (ADWR 1994d, p. 5-26, citing Oklahoma State Statute § 21-1452, 1453, Scenic Rivers Act Title O.S. 1991 § 1451 et seq.).

### Surface Water and Groundwater Regulation

Surface water rights in Oklahoma are not protected from groundwater pumping because there is no coordinated management of groundwater and surface water (Tellman 1994). In Oklahoma, "only groundwater directly under a stream or its banks is considered connected to surface water and susceptible to regulation as surface water" (Tellman 1994, p. 10). This type of groundwater is therefore subject to appropriation.

Although a system of prior appropriation for groundwater was adopted by the legislature in 1949, numerous problems arose, primarily because Oklahoma had never declared that groundwater belonged to the public. Therefore, enforcement of this law was considered a "taking." The groundwater law was revised in 1973 which changed the system from prior appropriation to one of allocation of basin supplies favoring utilization, not conservation (Tellman 1994, p. 25).

## **Oregon**

Oregon has a comprehensive program regulating both tidal and freshwater wetlands through a variety of statutes and through state permits. Oregon has adopted statewide planning guidelines for riverside lands and a tax credit program (Steiner et al. 1991a; 1994). Oregon has many programs related to riparian protection. It has developed voluntary committees to plan for localized management of riparian and wetland areas. Most riparian protection has primarily focused on forestry and logging management; however, water rights applications are reviewed for potential riparian area impacts (ADWR 1994d, p. 5-25). Several state agencies are involved in managing Oregon's wetlands and riparian areas. These include the following:

### Department of State Lands, Environmental Planning and Permits Section

The division is required to compile and maintain a statewide wetlands inventory. Cities or counties may develop wetlands conservation plans which include assessment of wetland functions, identification of threats, designation for protection, conservation or development, a mitigation and replacement plan, and monitoring provisions. Dredge and fill permits (removal-fill permit) are required by the division. This appears to be a fairly comprehensive program established to control dredge and fill activities in or adjacent to wetland areas (ADWR 1994d, p. 5-28).

### Department of Forestry

Oregon Department of Forestry has regulations to protect wetlands. These regulations control forestry and logging practices and include shade and canopy protection and down-wood regulations. Additionally, waters of the state are classified as Class I and Class II categories, where Class I waters are significant fisheries habitat. Specific forestry practices are prescribed for each class (ADWR 1994d, pp. 5-28, 5-29).

### Governor's Watershed Enhancement Board

The state has endorsed cooperative watershed management programs which involve the formation of voluntary local watershed councils. All local government bodies may become involved with these councils. The purpose of the councils is to create a process to guide watershed-based resource planning by local, state, and federal agencies and private landowners (ADWR 1994d, p. 5-29).

### Water Resources Department

The Water Resources Department may grant appropriations for instream flow rights, but only the State Department of Fish and Wildlife, Department of Environmental Quality, and Parks and Recreation may apply for these permits.

In its review of any permit to appropriate water, the Water Resources Department must determine that the applicant will not negatively impact the public interest. One consideration in the public interest review concerns riparian characteristics of the stream. Specifically, the review requires the following finding:

"There is nothing in the record to indicate the proposed use is likely to be detrimental to the riparian characteristics of the water resources. This riparian review is not applicable to groundwater sources" (ADWR 1994d, p. 5-29).

The requirement to investigate possible impacts to riparian areas in the public interest, is pursuant to the following statutory standards:

- a. The conservation of the highest use of the water for all purposes, including irrigation, domestic, municipal water supply, power development, public recreation, protection of commercial and game fishing and wildlife, fire protection, mining, industrial purposes, navigation, scenic attraction or any other beneficial use to which the water may be applied for which it may have a special value to the public.
- b. The maximum economic development of the waters involved.
- c. The control of the waters of this state for all beneficial purposes, including drainage, sanitation and flood control.
- d. The amount of waters available for appropriation for beneficial use.
- e. The prevention of wasteful, uneconomic, impracticable, or unreasonable use of the waters involved.
- f. All vested and inchoate rights to the waters of this state or to the use of the waters of this state, and the means necessary to protect such rights (ADWR 1994d, pp. 5-29, 5-30, citing ORS 537.170(5)).

### National Wetlands Inventories

The National Wetland Inventory has been completed for the state of Oregon. The state distributes these maps to local planning offices. The local governments must notify the state of proposed land use activities that would affect these mapped wetlands.

### Comprehensive Land Use Planning Act

Under this act, "local governments must adopt planning and regulatory programs consistent with statewide planning goals" (Kusler et al. 1993, p. 136). In particular, local governments must preserve "significant" wetlands in their original character unless conflicting uses arise (Want 1990). They must also classify estuarine wetlands for management purposes into natural units, conservation units, and development units. These divisions are based upon the characteristics of the wetland and require varying methods of protection.

### Coastal Zone Management Program

Coastal zone management policies are based largely on the statewide planning goals, which is the basis for compliance with the federal Coastal Zone Management Act. The statewide planning goals establish standards for land and water use and establish priorities for uses of natural resources. The Oregon Department of Land Conservation and Development has the authority to designate "areas of critical State concern" (Want 1990).

### Fill and Removal Act

A permit is required from the State Division of Lands for any filling (50 cubic yards of materials) or removal of material (50 cubic yards of material ) from waters of the state including coastal, tidal, or inland wetlands, and intermittent streams (Kusler et al. 1993, Want 1990). Mitigation may be required as part of the conditions of a permit. The statewide planning program's wetland protection policies and the fill and removal act's wetland protection provisions may be coordinated through optional local wetland conservation plans that have been approved by the Department of State Lands (Want 1990).

### Surface Water and Groundwater Regulation

Early in its history, Oregon established the appropriation act of 1909 which declared that all water within the state (both surface and groundwater) belongs to the public and could be appropriated through a permit system for beneficial use. In order to achieve coordinated policies and management of all water, the legislature created both the State Water Resources Board and the Water Resources Department.

Senior surface water rights holders and instream flows are protected from junior groundwater applicants where there is "substantial or undue interference" (Tellman 1994, p. 51). The Groundwater Act of 1955 establishes how groundwater may be appropriated within the state. "Critical groundwater areas" may be designated where certain conditions exist.

State policy declares that the establishment of minimum perennial stream flows is of high priority for the Water Resources Commission and the Water Resources Department (Tellman 1994, p. 51). No permit system exists for instream flow appropriations. Instream flow protection is accomplished where certain streams are not open to appropriation, (such as for municipal water supply or to protect fish or recreational values) (Tellman 1994, p. 51).

### **Texas**

According to Kusler (1994, p. 152), coastal and freshwater wetlands in Texas are afforded some protection through the Section 401 Water Quality Certification Program. A general antidegradation policy is applied to wetlands, although the state is currently tailoring this policy, as well as numeric and narrative surface water quality standards to protecting wetlands (Kusler et al. 1993).

### Dredge and Fill Permits-Coastal Public Lands

The General Land Office and the State School Land Board issues permits and easements for dredge and fill activities on coastal public lands. These lands extend from mean high tide in bays and estuaries to 10.35 miles offshore of the Gulf of Mexico. Leases and easements apply to floating piers, wharves, docks, jetties, groins, breakwaters, artificial reefs, fences, posts, levees, ramps, cabins, landfills, roads, oil and gas production platforms, and tank farms (Kusler et al. 1993).

### Senate Bill 1054

This bill directs the General Land Office and Texas Parks and Wildlife Department to develop a Wetlands Conservation Plan for coastal public wetlands. This plan will include mitigation policies, a wetlands inventory, and a no net loss goal, among other strategies (Kusler et al. 1993).

### Mitigation Banking Memorandum of Agreement and Other Mitigation

The state is working cooperatively with the Galveston District Corps of Engineers to develop a MOA on policies and guidelines for mitigation banking (Kusler et al. 1993).

WWF (1992) reports that through a Texas statute, the state must develop a plan for its state-owned coastal wetlands that will achieve no-net-loss. In addition, the General Land Office and Texas Parks and Wildlife Department's draft mitigation policies may be adopted in the near future.

### Texas State Water Commission

In Texas, state water law allows water to be appropriated for recreation and pleasure, game preserves, and public parks. When considering storage or diversion of more than 5,000 ac-ft per annum, the Texas State Water Commission shall assess the effects of a permit on fish and wildlife habitat and may require mitigation actions (ADWR 1994d, p. 5-27).

Additionally, the Texas water code reserves 5 percent of the annual firm yield of water in any reservoir located within 200 miles of the Gulf Coast for the Parks and Wildlife Department for release to bays and estuaries and for instream uses (ADWR 1994d, p. 5-27, citing Texas Codes, Water Code, §1.001 through 25, Title 2 §§11.023, 11.152, 16.1331).

### Surface Water and Groundwater Regulation

According to Tellman (1994), surface water rights in Texas are not protected from groundwater pumping because there is no coordinated management of groundwater and surface water. Senior groundwater pumpers are not protected from harm from other groundwater pumpers (Tellman 1994). A permit is not required for drilling wells in Texas. This is because the right to pump groundwater goes with the land ownership as long as that water is "beneficially used" (Tellman 1994, p. 18).

State courts have rejected the idea of conjunctive management on the basis that the legislature has not passed appropriate legislation to provide for unitary management of hydraulically connected underground and surface water (Tellman 1994). In Texas, "only groundwater directly under a stream or its banks is considered connected to surface water and susceptible to regulation as surface water" (Tellman 1994, p. 10). Therefore, this water is subject to appropriation.

Surface water is regulated under the appropriation doctrine with the requirements of beneficial use (beneficial uses include domestic and municipal, industrial, irrigation, mining, hydropower, navigation, recreation and pleasure, stock raising, public parks, and game reserves) (Tellman 1994, p. 26). Groundwater, on the other hand, is considered to be owned by the overlying landowner and may be used at will. There are no state controls on groundwater pumping. Groundwater conservation districts have been established with the intent of addressing overpumping, but have had little power to curtail pumping.

Tellman reports that Texas does not have specific provisions for instream flow permits and that it has not issued any permits. The Texas Water Commission does have the authority to issue new water permits while considering "existing instream uses and water quality" (Tellman 1994, p. 27).

## **Utah**

Wetland activities are currently not regulated in Utah (Kusler et al. 1993). With funding from EPA, the state is developing a wetlands program. Wetlands mapping, classification, and evaluation methods are being developed.

### Surface and Groundwater Regulation

In the early 1900s Utah adopted a unified approach to water management. No distinction is made between water above or beneath the surface of the ground and all types of water are thought to be owned by the public (Tellman 1994). All water is managed under an appropriation system where the water must be appropriated for a useful and beneficial purpose and senior appropriators (whether for surface or groundwater) have priority over junior appropriators (Tellman 1994). Applications may be rejected if the proposed appropriation would adversely affect "public recreation" or the "natural stream environment" (Tellman 1994, p. 39).

In 1986 Utah passed its first instream flow law which allows the state Division of Wildlife to file for instream flow rights in order to protect fisheries. Unappropriated water may not be delegated for instream use, only a transfer of water from another use may be used for an appropriation for instream flow (Tellman 1994, p. 40).

## **Virginia**

A model ordinance has been developed by the state for local governments to follow in wetlands regulation. Local governments primarily regulate permits for activities in tidal wetlands in the coastal plain. The State Water Control Board regulates activities in non-tidal wetlands, and the Virginia Marine Resources Commission is responsible for tidal wetlands.

### Virginia Wetlands Act

Local wetlands boards must issue permits for activities in tidal wetlands consistent with a model ordinance contained in statute. The Virginia Marine Resources Commission provides guidance for these permits, and will regulate an area if the local entity fails to do so.

### Virginia Water Protection Permit

In Virginia, the 401 certification program has been converted to a state permit, called the Virginia Water Protection Permit. The State Water Control Board regulates wetlands under Section 401 of the CWA and manages this permit. The State Water Control Board is currently developing water quality standards for wetlands.

### Mitigation Bank

The Virginia Department of Transportation has developed several small mitigation banks strictly for mitigating state highway projects (Kusler et al. 1993, p. 161).

## **Washington**

A strong comprehensive wetlands and riparian protection program has been established and continues to evolve in the state of Washington. Protection of these resources is due to a wide array of laws administered by multiple agencies at the federal, state, and local level. An executive order

establishes the goal for the state of Washington, which include an interim goal of no overall net loss in acreage and function, and a long-term goal of increasing the quantity and quality of Washington's wetlands.

Washington wetlands laws include the Shoreline Management Act (SMA), the Hydraulic Project Approval Code, the State Environmental Policy Act (SEPA), the Forest Practices Act, and the Floodplain Management Program. The Shoreline Management Act authorizes the regulation of coastal and freshwater wetlands by local governments consistent with standards established by the state (Kusler et al. 1993, p. 163). Surface water quality standards and antidegradation standards are also applied to wetlands. Critical areas, including wetlands, are required to be protected by the local governments through the state's Growth Management Act (GMA) (Kusler et al. 1993, p. 163).

#### Shoreline Management Act

The enactment of the 1971 SMA began to focus wetland protection goals in the state of Washington. The SMA requires a permit to ensure that any proposed activity complies with a local shoreline master plan. For the purposes of this act, this includes all land within 200 feet of ordinary high water mark of a state shoreline and may be extended to include an entire associated watershed. It is limited, however, to lakes at least 20 acres in size and streams with flows of at least 20 cubic feet per second. This program is administered by local jurisdictions with oversight by the Washington Department of Ecology (WDOE). Local governments are the primary permitting authority under the SMA.

This act regulates "all development" and "substantial development and conditional uses" that include dredging, drilling, dumping, filling, removal of sand, gravel, or minerals, bulkheading, driving of pilings, placement of obstructions, construction or exterior alteration of structures, or other interference with normal public use of surface waters (Kusler et al. 1993, p. 163).

According to Want (1990), Washington's SMA requires local government programs that regulate "shorelines of the state" within its jurisdiction. The WDOE may substitute state plans for "shorelines of state-wide significance" which are characterized by special ecologic or resource value.

#### The Hydraulic Project Approval Code

The hydraulic project approval code requires a permit for most activities below the ordinary high water mark of state waters. The intent is to protect fish and wildlife habitat. Consequently, the agencies that administer this program are the Departments of Fisheries and Wildlife (Steiner et al. 1991a, p. 57).

#### State Environmental Policy Act

For purposes of its SEPA, adopted in 1971, wetlands are defined as the lands extending landward from 200 feet in all directions; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all marshes, bogs, and swamps. No distinction has been made between riparian areas and wetlands; riparian areas are considered wetlands if they meet the three parameters of the federal definition. SEPA requires full disclosure of potential adverse environmental impacts of any proposed federal, state, and local actions. SEPA does not specifically protect wetlands or riparian areas, however, an environmental review must be completed before issuance of shoreline development permits, hydraulic project approvals, and other state and local permits for all federal, state, and local actions. Local government designation of environmentally sensitive areas for protection is one SEPA policy option, where specific areas are mapped and these areas are adopted as part of the local SEPA procedures.

### The Forest Practices Act

The Forest Practices Act was established to protect public resources while promoting and maintaining a sound forest products industry. It regulates all forest practices including road construction. It applies to wetlands considered type 2 waters (those that have one acre of open water at low water) and type 3 waters (those that have less than one acre of open water at low water and an outlet to a stream containing anadromous fish or if they have between 0.5 and 1 acre of open water at low water). Washington Department of Natural Resources reviews forest practices applications for approval of actions on state and private lands.

### The Floodplain Management Program

The Floodplain Management Program regulates construction and other activities that might increase flood flow and covers wetlands incidentally. This program is administered at the local level and by WDOE (Steiner et al. 1991a, p. 57).

### Executive Orders 88-03 and 89-10

Its Executive Order 88-03 directed the WDOE to undertake a study of Washington's wetlands and address the following issues:

- To provide a definition of the term wetlands and assess how it applies to regulatory programs.
- To assess the major functions and values of the state's wetlands.
- To determine the need for wetlands mitigation policy.
- To determine the need for public information.
- To examine landowner incentive programs that promote wetlands preservation.
- To analyze existing programs at federal, state, and local levels.
- To make legislative recommendations to reduce adverse impacts on wetlands (Steiner et al. 1991a, pp. 54-55).

A result of this executive order was the Washington wetlands study (Washington Department of Ecology 1988) which provided a foundation for Executive Order 89-10 on wetlands protection. Several goals and strategies for achievement were articulated in this executive order. An interim goal is to achieve no overall net loss in acreage and function. A long-term goal is to increase the quantity and quality of Washington's wetlands. WDOE is to provide guidance to other state agencies and prepare an action plan to preserve and enhance wetlands. All state agencies are to avoid activities that adversely affect wetlands or to adequately mitigate impacts. Agencies are also directed to seek opportunities for voluntary restoration and creation, to encourage sensitive design and planning on a watershed basis, and to locate agency-mandated activities not dependent on wetlands on suitable upland sites.

### Executive Order 90-04

Executive Order 90-04 directed WDOE to provide voluntary technical assistance to local governments. A model wetlands protection ordinance was prepared for local governments (Steiner et al. 1991a, p. 55). Washington's surface waters are presently divided into five classes (AA, A, B, C, and Lake Class) with each class having a different set of protection criteria. The standards present characteristic uses for each class and establish specific water quality criteria to protect those uses for each class. According to Steiner et al. (1991a, p. 56), as part of the state's triennial review of surface water quality standards, WDOE is proposing a sixth class for wetlands. If adopted, this class would be added to the standards to strengthen wetlands protection (Lund 1991). In addition to the characteristic uses common to all surface waters, the proposed wetland standards for this new

class include characteristic uses that represent vital functions served by wetlands in the ecosystem and the hydrological cycle: groundwater exchange, storm-water attenuation, and shoreline stabilization (Lund 1991). The wetland classification system allows for predictability and aids local governments and others in determining appropriate buffer widths and mitigation ratios (Kusler et al. 1993, p. 164).

Draft mitigation is being developed that would allow on-site and off-site mitigation banking. It would require monitoring for five years. Preconstruction bonding would be required (Kusler et al. 1993, p. 164).

#### Puget Sound Water Quality Management Plan

Of the many existing state regulations protecting wetlands and riparian areas in Washington, only the wetlands protection element of the Puget Sound Water Quality Management Plan focuses on the protection of wetlands as its primary purpose. The Puget Sound planning effort is a state/federal collaboration involving several agencies (Steiner et al. 1991a, p. 57).

#### Surface Water and Groundwater Regulation

In Washington, groundwater withdrawals are regulated conjunctively with surface water rights (Tellman 1994). In 1917 the state adopted a permit system as well as appropriation of groundwater withdrawals and surface water rights. Surface water rights are explicitly protected from groundwater pumping through the Washington groundwater code (Tellman 1994, p. 54). According to Tellman (1994), a well permit would be required for drilling a well near a stream. The permit could be denied by the state if the well were to endanger waterflow or water rights.

Washington has a "Water Resources Forum" that is developing policies for how to determine whether there is a "hydraulic continuity" (the relationship between groundwater and surface water) for particular situations (Tellman 1994, p. 55). Instream flow permits are treated as water appropriations and are given the same protection granted other surface water rights from groundwater pumping (Tellman 1994, p. 55).

#### Growth Management Act

The GMA requires local governments to conserve the most productive lands, protect critical areas, and reduce sprawl. They must also establish regulations to protect wetlands as critical areas. Local governments do not have to adopt state standards, nor prepare comprehensive wetlands protection programs. A model wetlands ordinance has been prepared by WDOE as an advisory document to aid local governments in developing wetlands protection regulations.

#### Section 401 Certification Program

The 401 certification program in Washington applies an antidegradation policy to wetlands and specific water quality standards for wetlands are being developed. A court challenge (Building Industries Association of Washington et al. v. State of Washington et al.) to conditions imposed on 401 water quality certification as standards rather than rules and to regulation of wetlands through the 401 certification program was upheld as legal. The standards in question pertained to a particular privately owned wetlands that was determined as jurisdictional under Section 404 and therefore required 401 water quality certification. In another case (The Department of Ecology et al., Respondents, v. Public Utility District No. 1 of Jefferson County et al., Appellants), the superior court of Washington upheld the authority of WDOE to require a certain minimum instream flow as a condition of granting a 401 water quality certification to a hydroelectric facility.



### Instream Flow Rights

The WDOE can claim instream flow rights to indirectly ensure an adequate flow for wetlands by establishing "minimum flows for streams to protect wildlife, fish, scenic, aesthetic, and other environmental values" (WWF 1992, p. 19). The Department of Ecology can also acquire rights to the water saved through state water conservation projects and use those rights for instream flow, rather than for diversion (WWF 1992, p. 19).

### **Wyoming**

Wyoming defines wetlands in their surface water regulations and in statute due to enactment of the Wyoming Wetlands Act. Wyoming Department of Environmental Quality (WDEQ), in its Water Quality Rules and Regulations defines surface waters of the state as "all permanent and intermittent defined drainages and lakes, reservoirs, and wetlands which are not man-made retention ponds used for the treatment of municipal, agricultural, or industrial waste; and all other bodies of surface water, either public or private which are wholly or partially within the boundaries of the State" (Chapter 1 Section 2gg). Wyoming water law allows for issuance of a water right for wetland creation since it is considered a beneficial use. The Wyoming Wetlands Act defines waters of the state as "all surface and ground water, including waters associated with wetlands, within Wyoming" (§ 35-11-103 (c)(vi)). Wetlands mean those areas exhibiting all three characteristics of hydrophytic vegetation, hydric soils, and wetland hydrology (§ 35-11-103 (c)(x)).

Some measure of protection for wetlands is provided primarily by the water quality protection program and the Wyoming Wetlands Protection Act that requires state notification of certain drainage activities and authorizing mitigation banks. Drainage provisions of the act become effective in 1996, and although the mitigation bank was authorized for implementation in 1991, it is still in development (Kusler et al. 1993, p. 171).

### Wyoming Wetlands Act

The Wyoming Wetlands Act (W.S. 35-11-308 through 35-11-311), passed in 1991, states that wetlands and its associated values deserve to be effectively managed, protected, and preserved. There is no stated goal of "no net loss" or "net gain." The act promotes balancing water development and wetland preservation activities to protect and accommodate industry, water, and wetland interests and objectives.

In accordance with the act, effective July 1, 1996, the WDEQ must be notified for actions draining a wetland (natural or human-made) of five acres in area or larger. The act makes a distinction between naturally occurring wetlands and those created through human actions for protecting the property rights of landowners and water right holders. Mining activities operated in accordance with WDEQ permits are exempt from these requirements. Additionally, the act established a mitigation credit banking system for compensatory mitigation. Wyoming Game and Fish Department has developed a computerized wetland evaluation procedure and banking programs (Coltman 1994).

### Surface and Groundwater Regulation

A permit must be obtained from the state engineer for either groundwater or surface water appropriation. If these waters are interconnected, then the groundwater permit may be subject to the surface water rights. In 1986, the Wyoming Wildlife Federation successfully placed an initiative on the ballot to recognize instream flows. As a result the Wyoming legislature enacted its own law providing limited instream flow protection. The state may appropriate minimum flows necessary to support fisheries (Tellman 1994, p. 57).

## LOCAL PROGRAMS

Local government involvement in wetlands protection is an important element of a statewide wetlands protection strategy (WWF 1992). Local governments "offer a unique perspective on wetlands protection because of their understanding of local resources and circumstances" (WWF 1992, p. 28).

### California

Regional authorities play an important role in wetland permitting. Most wetland permitting is the responsibility of regional entities "which must meet or exceed state standards" (Kusler et al. 1993, p. 52). A few states have enacted programs that protect unique natural resources, including wetlands, in defined geographical areas or on a regional basis. The Lake Tahoe Basin of California and Nevada receives such special regional protection which is a result of state and local efforts coupled with federal initiatives.

Local governments within the coastal zone may develop a local coastal plan alone or with assistance by the California Coastal Commission that allows them to regulate activities within their jurisdiction (Want 1990). A number of regional programs are in place, such as for San Francisco and Humboldt Bays and Suisan Marsh (Want 1990).

The San Francisco Regional Water Quality Control Board is developing a regional wetlands management plan, including consideration of adoption of some aspect of the Section 404 regulatory program.

### Colorado

Local governments are encouraged to define and regulate areas of "state interest." Local governments may also request the Colorado Department of Wildlife to designate areas of significant habitat (Kusler et al. 1993, p. 55).

### Boulder Creek Greenway

As part of its open space initiatives, the city of Boulder began a plan in the 1970s to develop a greenway along the major creek flowing through the center of town, Boulder Creek. This project received funding from many sources, including bond issues, private contributions, and support from nonprofit groups such as The Nature Conservancy (WWF 1992, p. 35). Over nine miles of land along Boulder Creek have been acquired, in addition to a 29-acre cottonwood-willow grove riparian area as well as wetlands.

### Connecticut

In New England, where there is a strong tradition of home rule, states typically allow their wetlands program to be delegated to local governments, with some state oversight. But even in New England, the states are assuming a greater role. In Connecticut, municipalities once were only encouraged to regulate wetlands; now, following amendments to Connecticut's Inland Wetland Law in 1987, they are required to do so. The town's legislative body is responsible for appointing a regulatory agency consisting of citizens from the community. In some Connecticut towns, "the planning and zoning or conservation commission may be acting as the local wetland agency. The wetlands agency adopts local program regulations and a map showing the general location of regulated areas within the town" (Water Resources Unit 1989, p. 11).

### Inland Wetlands and Watercourses Act

There are consistent statewide guidelines for enforcing the Inland Wetlands and Watercourses Act and for evaluating the impacts of proposed activities on wetlands and watercourses. All municipal regulations are reviewed by the Connecticut Department of Environmental Protection (CDEP) for conformity with the wetlands act. Freshwater wetlands are regulated at the local level, consistent with state standards. If a local government fails to enforce the act, the CDEP will. Each local government is required to report decisions and actions to CDEP monthly. The factors that a local commission is to consider include:

1. The environmental impact of the proposed action;
2. The alternatives to the proposed action;
3. The relationship between the short-term uses of the environment and the maintenance and enhancement of long-term productivity;
4. Irreversible and irretrievable commitments of resources that would be involved in the proposed activity;
5. The character and degree of injury to, or interference with, safety, health of the reasonable use of property that is caused or threatened; and
6. The suitability or unsuitability of such activity to the area for which it is proposed (Water Resources Unit 1989, p. 12).

Many Connecticut towns "...have adopted setbacks or buffer zones in their regulations and require a permit for such activities taking place adjacent to wetlands or watercourses" (Water Resources Unit 1989, p. 14).

### Exemptions

Some uses are exempt from wetlands protection, including some, but not all, farming operations; the construction of a residential home on a subdivision lot that had received a building permit prior to 1 July 1987; boat anchorages and moorings, not including dock construction; some ancillary, incidental residential uses; and the construction and operation of dams, reservoirs, and other water shortage facilities. Some activities are permitted as nonregulated uses, "provided they do not disturb the natural and indigenous character of the wetland or watercourse" (Water Resources Unit 1989, p. 15). These uses include conservation activities and outdoor recreation facilities.

### Local Wetlands Protection

Individuals who plan work in or around wetlands in Connecticut are required to contact their local wetlands agency prior to commencing such activities. In addition to local level approval, some activities are subject to state-level regulation, including: the construction or modification of any dam; the construction, encroachment, or placement of any obstruction within stream channels; construction or placement of any structure or obstruction within tidal, coastal, or navigable waters; diversion of water including withdrawals of surface or groundwater in excess of 50,000 gallons per day or any change in the instantaneous flow of any surface waters of the state where the tributary watershed area above the point of diversion is 100 acres or larger; discharges into the waters of the state; and discharges of fill or dredged materials pursuant to Section 401 and 404 of the CWA.

## **Florida**

### Critical Area Program

A few states have enacted programs that protect unique natural resources, including wetlands, in defined geographical areas or on a regional basis. Florida's critical area program applies to "areas of critical state concern," which may include an area containing natural, historical, or archaeological

resources of regional or statewide significance.  
Kansas

#### County Wetland Protection Program

In the Kansas state plan, there is also a policy recommendation that would "require local conservation districts to develop a county wetland protection program to promote the general protection and management of wetland areas...such a county protection program would encourage landowners to protect and manage wetland as part of a comprehensive conservation plan" (Kansas Water Office 1990, p. 31).

Individuals from different state and local agencies sometimes compete for wetlands protection responsibilities and frequently view wetlands protection from divergent perspectives. One state agency may place wetlands and riparian protection high on its agenda, while another may be lukewarm or even hostile on the issue. For example, in Kansas, the state water office has been critical of local conservation districts for taking "no action in identifying riparian and wetland protection areas," although it is their responsibility (Kansas Water Office 1990, p. 32). The water office has noted also that the Kansas Department of Wildlife and Parks has not used conservation easements for riparian and wetland protection purposes. As a result, the Kansas Water Office has concluded "thus, the [riparian and wetland protection] program which has been on the books for five years has yet to be implemented" (Kansas Water Office 1990, p. 32). This situation appears to be inconsistent with the policy of the Kansas legislature, which "envisioned a cooperative among several state agencies including the State conservation commission, the Kansas Department of Wildlife and Parks and the conservation districts" as well as the Kansas Water Office (Kansas Water Office 1990, p. 32).

#### **Massachusetts**

##### Wetlands Protection Act

As a result of the Wetlands Protection Act, Massachusetts's regulatory program for both inland and coastal waters is implemented primarily at the local level through volunteer local conservation commissions (or to the mayor of a city or the selectmen of a town) with oversight by the Massachusetts Department of Environmental Protection (Kusler et al. 1993, p. 93). The local conservation commissions also have the authority to acquire and manage wetlands as open space on behalf of the municipality.

Local conservation commissions issue permits, known as "orders of protection" for wetlands activities. These orders of protection must be consistent with the "restriction orders" adopted by the state for many of the coastal communities. The restriction orders must go through a public hearing process, and once adopted, are recorded at the county registry of deeds. A detailed map showing the affected wetlands accompanies the restriction order (Kusler et al. 1993).

In a survey of Massachusetts conservation commissions, it was found that some portions of the wetlands regulations "are not well understood, leading to inconsistent interpretation" by local officials" (Klein and Freed 1989, p. 503). As a result of the inconsistent regulatory interpretations, wetlands are being unnecessarily lost in Massachusetts. In addition, the survey also indicated that "commissions perceive themselves to be poorly equipped to adequately administer the Act. The lack of qualified staff and the sheer number of applications is also a factor in commission performance, as the survey showed that the commissions receiving the most filing [for permits] have not necessarily increased their staffing levels" (Klein and Freed 1989, p. 503).

Massachusetts officials consider their state to be a "leader in mandating the protection of wetlands resources" (Klein and Freed 1989, p. 506), but the decentralized approach taken in Massachusetts has caused some problems with implementation. Local officials do not always have

the backgrounds necessary to adequately administer and enforce the program. According to Klein and Freed (1989, p. 503): "Although there is only one Wetlands Protection Act, there are 351 local conservation commissions administering it in communities. This creates the potential for numerous administrative variations. Although the state environmental agencies strive to ensure consistency, there are grey areas in the Act which cause confusion at the local level."

### **Michigan**

The Goemaere-Anderson Wetland Protection Act authorizes the development of local wetland ordinances that are more restrictive than the state regulations. Where there are local ordinances, permits for actions within contiguous wetlands and isolated wetlands greater than five acres in size must obtain permits from these entities (Kusler et al. 1993, p. 99).

### **Nevada**

#### Lake Tahoe Statute

A special statute has been adopted which gives limited protection to wetlands within the Lake Tahoe Basin. The Lake Tahoe Regional Planning Agency is the planning agency for the Lake Tahoe Basin (Kusler et al. 1993, pp. 116-117).

#### City of Reno Wetland and Stream Environment Policy

Under its Wetland and Stream Environment Policy, the City of Reno has identified wetlands and stream zones in Washoe County (Kusler et al. 1993, p. 117).

### **New Jersey**

#### Pinelands Protection Act

A few states have enacted programs that protect unique natural resources, including wetlands, in defined geographical areas or on a regional basis. In 1979, New Jersey enacted the Pinelands Protection Act to regulate development and protect natural resources, including wetlands, in an approximately one million-acre, pine barren area in the south-central part of the state (Salvesen 1990). Wetlands and other areas within this reserve are regulated by the Pinelands Commission (Kusler et al. 1993, p. 120).

Another example of protection and management of special wetlands areas is the Hackensack Meadowlands (WWF 1992).

### **Oregon**

#### State Land Department Permits

The Division of State Lands issues individual permits for alteration of waters of the state. With the approval of local wetland conservation plans with a no net loss component, and appropriate local ordinances for issuing permits, this permitting authority can be delegated to local governments. If the local government does not have the necessary ordinances in place, the State Lands Department would retain the permit issuing authority but conduct expedited reviews of permit applications (WWF 1992).

#### Wetland Conservation Plans

In Oregon, locally developed wetland conservation plans (WCPs) were authorized by the 1989 state legislative assembly under Senate Bill 3, which established state policy concerning wetlands. WCPs are optional and are designed to provide better management of Oregon's wetlands while resolving conflicts between local comprehensive plans and state and federal wetland regulation. Comprehensive plans, like general plans in Arizona, are mandatory for local governments in Oregon.

These plans must achieve specific statewide goals, several of which are related to wetlands and riparian areas (Steiner et al. 1991a, p. 30).

As outlined in state statute and administrative rule, WCPs must contain specific components in order to be approved in Oregon. These components include: a site description and maps; a detailed wetland inventory; an assessment of wetland functions and values; identification of public uses and conflicting planned uses; designation of wetlands for protection, conservation, or development; specification of sites for fill or removal and conditions and procedures under which the activity will occur; a mitigation plan for replacement of wetland functions and values lost under the plan; monitoring provisions for both plan compliance and mitigation; specification of buffer areas and uses allowed on lands adjacent to wetlands; and policies and implementing measures. These components are compatible with the required elements for comprehensive plans in Oregon (Steiner et al. 1991a, p. 30).

## **Virginia**

### **Virginia Wetlands Act**

Virginia has also shifted the permit issuing authority to local governments in coastal tidal areas. As a result of the Virginia Wetlands Act, permits are required for wetland alteration. Local wetlands boards issue permits, and the state provides advice and reviews local permitting decisions (Cox 1989). Although the state government has the authority to reverse local wetland board decisions, "few reversals occur" in Virginia (Cox 1989, p. 535).

## **Washington**

### **Model Wetlands Protection Ordinance, Shoreline Master Plans, and Other Efforts**

Many local jurisdictions in Washington have provisions in their ordinances that help to protect wetlands. The publication of the model protection ordinance is an effort to encourage the development of local programs. Several counties (Island, King, Pierce, and Thurston) and some cities (Bellevue, Kirkland, and Olympia) have their own wetland protection programs. Shoreline master programs (SMPs) have been developed under the SMA. City and county offices are responsible for administering SMPs, but wetland inventories are often incomplete so actual boundaries are not always accurately identified (Washington Department of Ecology 1988). The Puget Sound Water Quality Management Plan covers the 12 counties in the Puget Sound area and is the most comprehensive local program in existence in Washington state. Other options to protect wetlands and riparian areas include comprehensive plans and zoning ordinances; environmentally sensitive area ordinances; clearing, grading and filling ordinances; and SEPA policies.

### **Environmentally Sensitive Area**

Environmentally sensitive area (ESA) protection is one SEPA policy option. According to SEPA rules, an ESA is an area designated and mapped by a county or city which includes but is not limited to places with unstable soils, steep slopes, unusual or unique plants or animals, wetlands, or areas which lie within floodplains. In Washington, local governments are free to administer ESAs as long as the locations and extent of all ESAs are clearly mapped, are adopted by reference as part of local government SEPA procedures, and are filed with WDOE (Steiner et al. 1991a, p. 58).

According to Steiner et al. (1991a, p. 28), a few states have enacted programs that protect unique natural resources, including wetlands, in defined geographical areas or on a regional basis. Local governments in Washington can establish environmentally sensitive areas (Jennings et al. 1988).

## **NONREGULATORY PROGRAMS IN OTHER STATES**

The discussion of other state nonregulatory programs focuses primarily on information from five selected western state programs as presented in thesis research (Coltman 1994). Information about other state programs was also compiled from the ADEQ, AGFD, and ADWR reports, other reports and material provided by the RAAC, and additional sources as referenced. Information about local nonregulatory strategies and private initiatives in other state riparian and wetland protection programs was limited and as a result, not presented in detail.

Initially, the discussion on other state programs was limited to the five states discussed in the thesis literature, namely, Colorado, Idaho, Montana, Washington, and Wyoming. Requests from the RAAC for information about programs in adjacent states expanded the survey to include California, Nevada, New Mexico, and Utah. (As a group, these states were not part of the thesis research due to their limited wetlands/riparian protection efforts or unsuccessful attempts to obtain information from certain state agencies.) Additional information from the three Arizona agency reports and information provided by the RAAC resulted in a survey of the following 21 states: California, Colorado, Connecticut, Florida, Idaho, Kansas, Massachusetts, Michigan, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Dakota, Oklahoma, Oregon, Texas, Utah, Virginia, Washington, and Wyoming.

Nonregulatory programs in other states are presented within the categories of federal, state, local, and private initiatives. Because many nonregulatory approaches have been previously discussed in Chapter II, especially pertaining to nonregulatory federal and private initiatives, the reader is advised to examine that chapter. Additionally, available information limited the extent of local and private initiatives undertaken in other states.

### **FEDERAL PROGRAMS**

At the federal level, nonregulatory programs have been initiated in other states that overlap considerably with the discussion of nonregulatory federal programs in Arizona, as discussed in Chapter II. Therefore, to eliminate duplication of program information, the reader is directed to Chapter II for a presentation of nonregulatory federal programs that are important strategies in Arizona, as well as in other states, for protecting wetlands and riparian areas.

As an overview, federal nonregulatory programs employ such mechanisms as acquisition; planning; restoration, creation, and management; incentives and disincentives; and technical assistance, education, and outreach (WWF 1992). These programs involve land management agencies such as BLM, natural resource agencies such as USFWS, SCS, and EPA, and the Corps and Bureau of Reclamation. Nonregulatory federal programs may provide the opportunity for flexibility and creativity in developing a state riparian protection program for Arizona.

### **STATE PROGRAMS**

Examining other states' nonregulatory strategies may help shape effective nonregulatory approaches for Arizona. At the state level, programs can be developed or broadened to encourage the protection of natural resources, such as riparian areas. Voluntary BMPs, tax incentives, cooperative agreements and actions, no net loss policies, technical assistance and education, and executive orders all serve to promote and encourage wetlands protection.

## **California**

California State Water Resources control board considers its water quality assessment database a recognition program. This database does include some wetlands. The California Department of Fish and Game has a natural diversity database of sensitive species and their habitats, including wetland-related species. Establishing such databases is an essential step to identify resources worthy of statewide recognition (Steiner et al. 1991a, p. 46).

### The California State Coastal Conservancy

The California State Coastal Conservancy, created by the legislature in 1976, is an agency that works cooperatively with private landowners, developers, other public agencies, local governments, and nonprofit organizations to restore specific wetland areas. According to Kusler and others (1994, p. 29) it has undertaken more than 100 wetland projects, many of which involved off-site compensation for wetlands lost. Additionally, the California State Coastal Conservancy has the power to accept dedications of property, as well as "lease, rent, sell, exchange, or otherwise transfer land..." (Kusler et al. 1994, p. 32). It also has the authority to make grants to nonprofit organizations and helps local governments implement their Local Coastal Programs (WWF 1992).

### The California Wetlands Protection Act

Under the California Wetlands Protection Act (Section 5813), wetlands are identified and prioritized for acquisition purposes. The Department of Parks and Recreation and Department of Fish and Game are authorized to acquire priority wetlands.

### The California Land Conservation Act

The California Land Conservation Act allows tax breaks for wetlands and other types of open space (Kusler et al. 1994, p. 53).

## **Colorado**

Colorado has an outstanding waters program (Steiner et al. 1991a). It also has a statewide trust fund, encourages voluntary BMPs, and facilitates cooperative efforts by state agencies.

### Conservation Trust Fund

In Colorado, lottery revenues fund its Conservation Trust Fund, which is used for acquiring, developing, and maintaining "conservation lands" which range from state parks and historic sites to wetlands (WWF 1992). State lottery mechanisms for revenues are often more acceptable to voters than less "voluntary" means. Yet lotteries often fund other programs, resulting in competition for funds.

### Voluntary Best Management Practices

As part of Colorado's Clean Water Act Section 319 program for nonpoint source pollution, voluntary BMPs tailored to the individual watershed are used for resource enhancement and protection. Three categories of recommended BMPs were initiated in 1990, and a fourth category was added in 1992. These categories are agriculture and silviculture; urban and construction site runoff; mining; and hydrologic modification. The newer hydrologic modification program was the first hydrologic modification in the nation to be approved by EPA for a NPS management program. BMPs within these categories directly relate to riparian area stabilization for streambank protection from scour and erosion and maintaining the water quality of riparian and sensitive areas during road construction for timber harvesting.



### Cooperative Efforts

Colorado agencies are working with BLM and the USFS on their riparian management programs. Private groups are also helping in the understanding and protection of wetlands. For example, The Nature Conservancy is conducting a riparian wetland classification inventory on select rivers in Colorado. The Colorado Riparian Association was formed to protect wetlands and riparian areas; a Wetlands Advisory Group recommends appropriate management for wetlands; and the Society of Wetland Scientists provides scientific and educational information on wetland management and protection.

### **Connecticut**

#### Tax incentives

Real estate tax statutes that apply specifically to wetlands are contained within the Connecticut Wetlands and Watercourses Act. Specifically, where an owner is denied a license related to regulation of the wetland or watercourse, the property may then be revaluated to reflect the fair market value considering the restrictions associated with denial of the permit or license.

#### Data Management System

The WWF reports that Connecticut has a centralized data management and analysis system with wetlands as one component. Information from this database is provided to all agencies and local governments (WWF, 1992).

### **Florida**

A number of nonregulatory efforts have been initiated at the state level. These include such program as: "Save Our Rivers Program (administered by the Water Management District); Surface Water Improvement Districts Management Program; Conservation and Recreation Lands Program; Save Our Coastal Program (\$250 million in bonds)" (Kusler et al. 1994, p. 64). Florida's outstanding waters program also gives some level of protection to wetland and riparian areas.

### **Idaho**

#### Voluntary Best Management Practices

Voluntary BMPs (for agricultural activities) and planning and implementation of water quality management plans are important components of Idaho's nonregulatory protection strategies. BMPs for forest practices are established through the Idaho Forest Practices Act. An interagency group is developing BMPs for riparian areas. Local conservation districts implement BMPs through the State Agricultural Water Quality Program.

#### Comprehensive State Water Plan Act of 1988

The designation of rivers as natural or recreational under the Comprehensive State Water Plan Act of 1988 may preclude certain activities from occurring. This act also provides for technical assistance and voluntary BMPs for agricultural practices. The designation of certain Idaho rivers as outstanding waters is another recognition program that gives some degree of protection to wetlands and riparian areas.

#### Acquisition and Education

Idaho Department of Parks and Recreation and Idaho Fish and Game Department have developed an acquisition program funded by hunting license fees. The Idaho Department of Environmental Quality provides funds to the SCS for the development of educational materials concerning riparian issues.

## **Kansas**

Technical assistance, education, and outreach is provided by the Kansas Fish and Game Department through its Wildlife Education Service. This program is available to all state and public schools and provides wetlands information (as it relates to wildlife and habitat protection) through teacher guides and reading materials (WWF 1992). Additionally, the State Conservation Commission provides cost-share opportunities for riparian and wetland projects.

## **Massachusetts**

### Education and Training

The Massachusetts Department of Environmental Protection is very active in providing education and training to its staff and to the public through workshops, handbooks, and a quarterly newsletter reporting on the latest developments in wetlands protection (Kusler et al. 1994, p. 95).

### Tax Incentives and Land Acquisitions

In certain cases landowners can receive a reduction in local real estate taxes for land that he or she has protected from development (Kusler et al. 1994, p. 96). Additionally, a land acquisition program funded by the state, is administered by the Executive Office of Environmental Affairs.

### No Net Loss Policy

In 1990 the Massachusetts Water Resources Commission adopted a state policy of no net loss of wetlands in the short-term and a net gain in the long-term, to be implemented by the Department of Environmental Protection. This policy incorporates the principles of avoidance, minimization, and mitigation.

## **Michigan**

### No Net Loss Policy

Michigan's governor has issued a "no net loss" policy, but has not issued an executive order for the protection of wetlands. Michigan has set both short-term and long-term goals. For its shorter term regulatory program, the goal is no net loss by acreage or function. In the longer term, the state would like a net gain of 500,000 acres of wetlands by the year 2000.

### Donations, Easements, Deed Restrictions, and Land Acquisition

Michigan, in addition to its permits, has a system of voluntary wetland protection and benefits to landowners. Land can be donated to a private foundation or a government agency and the landowner will receive a tax deduction. Michigan has a conservation easement provision that allows "certain rights and privileges concerning the use of land or a body of water to a non-profit organization, government body, or other legal entity without transferring title to the land" (Brown 1988, p. 13). Deed restrictions concerning future land use can be placed on the property along with the easement. Michigan also has funds for the acquisition of wetlands for fee simple through the Michigan Natural Resources Trust Fund and the Michigan Duck Stamp Program as well as private and federal funding sources.

### Public Access Stamp Program

According to Meeks and Runyon (1990), several states are trying to augment wildlife conservation and management programs on public lands with cooperative programs to conserve wetlands and other environmentally sensitive areas under private ownership. State subsidies often stimulate such cooperation. They also report that through its Public Access Stamp Program, Michigan has enrolled more than 132,000 acres whose owners are paid a set fee in return for access

by hunters. These Michigan landowners are protected from liability and the state manages the wildlife habitat in cooperation with the landowner.

#### Goemaere-Anderson Wetland Protection Act

Kusler and others (1994, p. 33) note that under the Michigan Goemaere-Anderson wetland protection act, when a permit is denied for a proposed wetland activity, a revaluation of property may be made to reflect the fair market value under the use restrictions.

#### Technical Assistance and Education

A pilot project is being developed for local officials to assist in the identification of wetland areas, incorporate wetlands into local planning, and help citizens through the permit process (Kusler et al. 1994, p. 100).

#### **Montana**

Voluntary BMPs and technical assistance and education programs are implemented through the NPS program. Additionally, Montana utilizes land acquisitions as a nonregulatory approach to wetland and riparian protection.

#### Non-Industrial Private Forest

Forest Stewardship Program to assist private landowners to develop Forest Stewardship plans. Workshops are provided which include riparian/watershed protection, ownership responsibility, threatened and endangered species, timber and range management. Over 700 landowners have participated with over 350 plans, for over 200,000 acres, have been completed since 1991.

#### **New Jersey**

##### State Policy

According to Meeks and Runyon, New Jersey has one of the strongest statements of purpose in the nation. That statement reads in part:

...in this state, where pressures for commercial and residential development define the pace and pattern of land use, it is in the public interest to establish a program for the systematic review of activities in and around freshwater wetland areas designed to provide predictability in the protection of freshwater wetlands;; that it shall be the policy of the state to preserve the purity and integrity of freshwater wetlands from random, unnecessary, or undesirable alteration or disturbance; and that to achieve these goals it is important that the state expeditiously assume the freshwater wetlands to permit jurisdiction currently exercised by the United States Army Corps of engineers...[referring to Section 404 of the Clean Water Act] (as quoted by Meeks and Runyon 1990 in Steiner et al. 1991a).

##### Tax Incentives

New Jersey's Freshwater Wetlands Protection Act allows a tax reduction for unbuildable wetlands (Kusler et al. 1994, p. 121).

#### **Oklahoma**

##### Education and Outreach

State agencies have held field days and published brochures for how wetlands are delineated and how individual landowners can recreate or enhance wetlands. The brochure for the program, "Oklahoma's Partners for Wildlife" was published by the USFWS with cooperation from Oklahoma

State University Cooperative Extension, Soil and Water Conservation Society, Oklahoma Department of Wildlife Conservation, The Conservation Commission, and Ducks Unlimited (Kusler 1994, p. 135).

## **Oregon**

### Education and Outreach

Several educational materials have been produced at the state level describing wetlands and estuaries in the state of Oregon, as well as describing the wetlands inventory, the removal-fill permit program, and the mitigation process.

## **Texas**

The General Land Office is developing a guidebook addressing state wetland regulations for coastal wetland managers.

## **Virginia**

Educational materials for coastal wetlands has been developed by the Virginia Institute of Marine Sciences. These materials describe wetlands types and their functional values.

## **Washington**

Several nonregulatory programs exist in Washington and are administered primarily by WDOE. Technical assistance, grant programs, public education, and landowner preservation or enhancement incentives all contribute to protection of wetlands in Washington state. Most of these nonregulatory initiatives are intended to be used in conjunction with regulations (Steiner et al. 1991a, p. 60).

### Technical Assistance

The wetlands section of WDOE provides technical assistance of several types. Site evaluations to determine wetlands boundaries and potential impacts from proposed developments are conducted. They also conduct workshops to train others (usually local government personnel) in wetland identification, boundary delineation, plan review, impact assessment, and other regulation administration.

Additionally, many informational and educational materials have been developed to assist the public and regulatory agencies in understanding the importance of wetlands in Washington. WDOE has an education specialist on staff responsible for disseminating materials and promoting wetlands education. Materials developed for the promotion of wetlands importance and protection is extensive and includes publications, videos, and a traveling wetlands display. A restoration guidebook provides information concerning restoration of wetlands and riparian areas in Washington. Periodic workshops are held by technical staff for other agencies and local government staff.

### Model Wetlands Protection Ordinance

A model wetlands protection ordinance has been developed by WDOE as a tool for local communities to achieve no net loss within their communities. It serves as a guidance document, consisting of a compilation of recommended standards and policies, for local communities to consider in strengthening their protection of wetland resources within their jurisdiction. The model wetlands protection ordinance was developed based on the best aspects of existing local ordinances and WDOE recommendations. Given the emphasis on local level initiatives (SMPs and other programs) resulting

from various state laws, this model ordinance is very important to ensure uniformly adequate local wetland protection programs. WDOE will also provide assistance by providing expert testimony, review assistance or advice, and funding for the development of policies and ordinances.

### Education

Public education is an important role of WDOE. Educational materials are produced in various media including videos, publications, public service announcements, curricula, displays, and posters. Topics range from understanding functions and values of wetlands to relatively technical overviews of wetland regulations. A monthly newsletter, Coastal Currents, provides current summaries of relevant news regarding wetland protection activities in Washington. WDOE, with the Department of Wildlife, also conducts workshops on wetlands for teachers and encourages them to integrate wetlands topics in school curricula. One particular group that has been targeted with educational material is wetland landowners. All of the educational materials are geared toward providing broader understanding of wetland functions and values and instilling an attitude of stewardship in the public.

### Incentives

Several types of incentives exist for encouraging landowners to protect wetlands in Washington. These include transfer of title (land donation, or sale at less than market value), direct incentives (federal farm programs, tax incentives, and private incentives), and nonmonetary incentives. Within each of these categories, options exist to encourage wetland creation and preservation. Incentives that result in the transfer of title are land donation or sale for less than market value to a qualified public agency, land trust, or conservation organization. Tax deductions equal to the appraised value can result in the case of donation. If property is sold for less than its market value, then a tax deduction will be based on the difference between market value and sale price. Conservation easements and development rights can also be sold or donated and yield tax breaks if property values are reduced. With easements and development rights sales, the original ownership of the property is retained (Steiner et al. 1991a, p. 61).

### Executive Orders

In late December 1989, Executive Order 89-10 (Protection of Wetlands) was signed that described the functions and importance of wetlands, and established an interim goal for the state of Washington of no net loss of function and value of its remaining wetlands base (based upon the function and acreage). An increase in the quantity and quality of the wetlands resource was established as the state's long term goal. Additionally, state agencies were directed to avoid activities that resulted in negative impacts to wetlands or to mitigate the adverse impacts. The following spring, Executive Order 90-04 (Protection of Wetlands) reiterated the importance of wetlands functions and values and ordered state agencies to require mitigation of wetland impacts for all agency actions affecting wetlands.

### Voluntary Best Management Practices

Voluntary BMPs for forest practices have been established within the Forest Practices Rules and Regulations. Meanwhile, agricultural BMPs are discussed in a MOA with the conservation districts and the SCS. A stormwater manual itemizes BMPs appropriate for stormwater activities and is available to the public.

### Memorandum of Understanding

A MOU between the Department of Ecology and the local conservation districts serves to assist farmers with implementing Best Management Practices to comply with water quality regulations (Kusler 1994, p. 164).

### **Wyoming**

An executive order was drafted in 1991, but was replaced by the Wyoming Wetlands Act which essentially accomplishes the same purposes of protecting wetland resources (Steiner et al. 1991a).

### Rangeland Stewardship Project

Through Wyoming's rangeland stewardship project, federal and state agencies give financial assistance to landowners completing habitat improvement projects (Goldsmith and Clark 1990). Plans for improvement are designed by a committee composed of federal and state biologists and local landowners (Goldsmith and Clark 1990).

### Memorandum of Understanding for the Protection and Mitigation of Wetlands and Other Surface Waters

A MOU for the Protection and Mitigation of Wetlands and Other Surface Waters was established in January 1993 among several federal and state agencies to protect and mitigate wetlands and other surface waters from disturbances associated with Wyoming Department of Transportation (WDOT) highway construction projects. Mitigation banks will be used to compensate for all unavoidable wetland impacts due to WDOT's roadway development and operation and maintenance activities conducted in compliance with all CWA regulations. This MOU establishes a very detailed mitigation banking system for wetland bank transactions and identifies BMPs for contamination and pollution, mitigation, erosion control, and construction practices.

## **LOCAL PROGRAMS**

Nonregulatory programs at the local level can target local needs through flexibility, creativity, and an understanding of the local resources and circumstances. Local conservation districts play an important roll in nonregulatory programs in several states. Additionally, education, easements, and tax incentives are successful components of other states evolving wetlands and riparian protection programs. The techniques discussed in this section can provide some insight as to what could be explored for protecting riparian areas in Arizona.

### **Connecticut**

#### Tax Incentives and Education

In addition to its regulatory program, Connecticut also uses incentives for implementation. Landowners of wetlands can receive tax relief for areas of their property with restrictions placed on it. Public education programs for local governments have also been implemented.

### **Florida**

#### Education

Several programs provide incentives for landowners to conserve wetland resources. "Save

Our Rivers Program" is administered by the Water Management District

## **Kansas**

### Easements

The state of Kansas can "purchase or obtain land in the form of an easement for certain conservation purposes including riparian and wetland preservation and protection" (Kansas Water Office 1990, p. 32). In addition to easements, local conservation districts are to identify riparian and wetlands areas.

## **Michigan**

### Education and Outreach

Wetland materials for primary and secondary schools have been developed for educators (Kusler et al. 1993, p. 100). Numerous guidebooks and materials have been developed as educational materials on wetlands in Michigan.

## **Nevada**

### Tax Incentives

The City of Reno provides tax incentives for preserving and restoring wetlands (Kusler et al. 1993, p. 117).

### Acquisition

Kusler reports that there is a state bond act for purchasing sensitive properties identified within the Lake Tahoe Basin, as well as a bond issue for the Las Vegas Wash (Kusler et al. 1993, p. 117). The Las Vegas Wash is being developed as a greenway.

## **Virginia**

### The Chesapeake Bay Preservation Act

This act authorizes technical assistance and support for local governments. The Chesapeake Bay Local Assistance Department works with local governments to develop wetlands protection ordinances for the Chesapeake Bay area (Kusler et al. 1993, p. 161).

## **Washington**

### Tax Incentives

According to a survey administered by Steiner et al. (1991a), ten states have some form of tax incentives to protect wetlands. Goldsmith and Clark (1990) report that more than half of the states have tax programs that encourage the protection of open space. Incentives include both tax exemptions and credits. Property tax incentives may be provided by counties for protecting natural areas, including wetlands. In Washington, six counties use the state's Open Space Act, which provides property tax reductions, to protect wetlands (Steiner et al. 1991a).

### Technical Assistance and Education

The state helps local governments improve their ordinances to better protect wetland resources. Video tapes, curricula guides, and many other educational materials have been developed educate the public about the importance of wetlands and to guide their protection. Executive Order 90-04 directed WDOE to provide voluntary technical assistance to local governments. A model wetlands protection ordinance was prepared for local governments (Steiner et al. 1991a, p. 55).

### Other Efforts

In Washington, participation in local land trusts, inclusion of land in the Washington Register of Natural Areas, purchase of the state waterfowl stamp by people who do not hunt waterfowl, and donation of time, materials, or equipment to rehabilitate wetlands are additional important nonregulatory incentives (Steiner et al. 1991a, p. 61).

## **Wyoming**

### **Education and Outreach**

Kusler and others (1993) report that conservation districts are involved in education outreach and demonstration projects in Wyoming.

## **PRIVATE INITIATIVES**

Wetland protection is often limited by available resources and authority at all levels of government. Private programs are therefore critical in providing leadership, financial resources, as well as the commitment to protecting wetland resources. According to the WWF, "private nonprofit organizations have played significant roles in acquiring, restoring, and preserving wetlands and educating the public about their values" (WWF 1992, p. 28).

In general, research and advocacy groups may bring scientific information to the public and provide political impetus for wetland protection. Recreational groups provide education as well as acquiring, protecting, or maintaining wetlands. Grassroots groups such as "Friends of the Santa Cruz River" help build public interest in and support for local area protection, acquisition, or management. Other groups may take the role of "watchdog" and participate in governmental processes to further their objectives. Other groups, such as foundations or land trusts may work to raise money to acquire lands or protect critical resources. In addition, private initiatives through corporations and individual landowners or citizens can contribute to wetlands protection through such actions as lobbying elected officials for wetlands protection; being involved in land use planning and development issues; contributing lands to organizations for wetlands conservation and protection; and initiating efforts on their own lands for wetlands protection, enhancement, and creation (WWF 1992). In addition to the national private initiatives discussed in Chapter II, the following are examples of private initiatives of note in other states.

### **American Rivers**

American Rivers protects and restores America's river systems and promotes a river stewardship ethic. It works for strengthening state laws and for restoring America's degraded rivers. Environmental safeguards are pursued through national hydropower policy, with its success measured in the number of river miles and streamside acres protected and the number of proposed dam projects prevented.

### **Ducks Unlimited (DU)**

States can enter into cooperative agreements with or encourage the involvement of non-profit groups in wetlands protection. Ducks Unlimited, among other private conservation organizations, encourage wetland protection by making rental payments to landowners to set aside land for conservation purposes (Steiner et al. 1991, p. 47). Rental payments differ from acquisition and



easement programs because the landowner retains full title to the land and all associated rights and responsibilities (Goldsmith and Clark 1990).

DU has also entered into agreements with the BLM, USFWS, and the U.S. Office of Surface Mining to enhance the ability to protect wetland resources. The purpose of these agreements is "to coordinate efforts to achieve the goal of no net loss of wetlands" (WWF 1992, p. 18). In particular, DU is assisting the U.S. Office of Surface Mining in their determination of appropriate sites for creating wetlands on surface mines and other disturbed lands. Additionally, DU has acquired over 3 million acres of wetlands in the United States and Canada and has spent numerous dollars on habitat restoration (WWF 1992).

#### **Fans of Fanno Creek (Oregon)**

A grassroots group, called Fans of Fanno Creek, was concerned with development plans along Fanno Creek, located outside of Portland. It worked with the developer in reaching an agreement that required a 50-foot buffer along the creek, with a \$3,000 fine for violating this buffer zone; an inventory and guarantee of protection of all seeps and springs; and the authority of Fans of Fanno Creek to conduct inspections of the property during construction (WWF 1992, p. 36).

#### **Isaak Walton League of America**

The Isaac Walton league provides technical assistance for the protection of wetlands through its "Partners for Wetlands" program which focuses on farmers' efforts to manage their lands for wetlands and wildlife protection (WWF 1992, p. 158). The organization offers a kit with information on restoring wetlands, particularly waterfowl habitats, wetlands fact sheets, fundraising and public relations ideas, and information about specific projects (WWF 1992, p. 158).

## **GENERAL CONSTRAINTS FOR EXISTING PROGRAMS IN ARIZONA**

### **Introduction**

There are numerous programs that exist at the federal, state and local levels that address one or more facets of the riparian ecosystem as seen from the previous section. While few programs, such as Sections 404 and 401 of the Clean Water Act, have the potential to provide substantial protection of riparian resources, many of the existing regulatory and planning measures provide only incidental protection. This is due, in large part, to the agency mission-driven perspective of most regulatory and planning programs.

The current legal and scientific climate reflects a substantial shift in overall perspective toward the environment. The standard, mission-driven perspective noted above is being replaced by a resource-driven perspective that considers a systems-based approach. Current laws, however, continue to be based primarily on the compromises that exist between man's real needs to use the raw materials and resources that drive economic, social and political growth and the need to conserve, as well as desire to protect and preserve, these specific resources. Pressure is also growing for individual property owners to expect "fair compensation" when their ability to use these resources is limited by regulations designed to protect the "public good."

In addition to the issues raised above, the effectiveness of existing riparian area protection and management programs within the State are impacted by several constraints. These generalized constraints include: Legislative Approach to Riparian Issues, Funding/Staffing/ Enforcement, Uncertainty in the Regulatory Review Process, and the Availability of Scientific Studies and Transferability to Riparian Management Measures.

### **Previous Legislative Efforts for Riparian Area Protection**

Prior to World War II, the combination of mining, cattle ranching and irrigated agriculture served as the focus of Arizona's economic growth. This interest in meeting the needs of the people played a significant role in determining the State's cultural makeup. Since Arizona's legislature was drawn from this background, its natural resource laws and policies naturally reflected these priorities.

Since World War II, however, the State's population and cultural makeup has changed dramatically. Only a small fraction of Arizonans now work the land. Few people understand the process whereby sunlight and land become food and fiber to feed, clothe and shelter them. In light of this trend, numerous measures to address specific environmental issues such as groundwater withdrawals or surface water quality standards have been adopted by the Legislature. As the choices between economics and environmental management objectives have become more difficult, those legislative proposals which can, fairly or unfairly, be interpreted as limiting a person's ability to realize economic rewards from the land are finding little political support. Because riparian protection proposals typically imply or include limits on the State's traditional methods of land management and water allocation, they have fared poorly in the Legislature. Following are examples of attempts to pass legislation relating to protection of riparian areas.

In 1978, House Bill (H.B.) 2326 unsuccessfully proposed that counties be authorized to "adopt standards for protection of watercourse and riparian environment from detrimental effect," without defining "riparian environment" or "detrimental effect."

By 1989, interest in riparian issues had coalesced to the extent that House Concurrent Resolution 2022 unsuccessfully proposed establishing an Advisory Committee on Riparian Resources, to be co-chaired by one Senator and one Representative, which would be charged with developing definitions and providing a report, proposing legislative action alternatives, by December 1, 1990.

In 1991, Senate Bill (S.B.) 1109 unsuccessfully proposed a riparian protection package that assigned additional responsibilities for the Arizona Game and Fish Commission and added riparian vegetation as a beneficial use for instream flow certification purposes. It also required the Water Commission and Director of Water Resources to consider the effect of water diversion on riparian resources when considering new water appropriation applications.

In 1992, H.B. 2404, and the essentially identical S.B. 1349, attempted to establish a riparian advisory committee, assign additional responsibilities to the Game and Fish Department, and Water Commission, and change some aspects of instream flow requirements. These were defeated despite the support of the Governor.

S.B. 1030, a less comprehensive version of S.B. 1349, was passed in June 1992. It created the RAAC and authorized the three agency studies and this report, but did not offer any direct protection to riparian resources.

While no comprehensive riparian protection measures have yet survived the legislative process, two Executive Orders; 89-16 Streams and Riparian Resources (June 10, 1989) and 91-protection of Riparian Areas (February 14, 1991) have been signed directing specific action by state agencies.

The management of riparian areas has been driven by the specific missions of the agencies. Mission statements include water supply to ADWR, water quality to ADEQ, habitat protection to AGFD, and floodplain management to the County Flood Control Districts. These mission statements have come into conflict with each other. One example of this conflict can be found in local floodplain ordinances where vegetation clearing may be encouraged and revegetation may be an unpermissible use. A second example would be that a surface water withdrawal permitted by ADWR would not typically consider the downstream water quality or vegetation/habitat impacts that might occur due to reduced flows.

### **Funding/Staffing/Enforcement**

The availability of funds is an age-old dilemma for any program. In Arizona, limited funding for riparian acquisition, protection and enhancement is available. The Heritage Fund provides money to both the State Parks and Game and Fish Departments for the acquisition, protection and enhancement of natural areas and wildlife habitat (of which riparian areas are an important component). Recent legislation (H.B. 2590) provides funding of \$5 million annually for riparian restoration and enhancement projects.

Riparian issues must often compete, through the legislative process, with other public issues for adequate funding. Does the public want better education programs, public transportation, crime prevention, or other health and welfare programs--or more riparian protection?

Part of the problem has been relieved through private funding sources. Conservation organizations (e.g., Nature Conservancy, Ducks Unlimited, Trout Unlimited, and a new

"development rights acquisition" program sponsored by the NRCDs) are providing privately-funded programs to acquire, re-vitalize and enhance riparian areas.

The limited availability of agency funding to implement existing riparian-related regulations is yet another constraint. The number of staff on hand to process permits applications and enforce regulatory violations is extremely limited, in most instances, and competes with many other agency priorities. As examples, the ADEQ has a single staff person processing Section 401 water quality certifications for the entire state, and the COE has one staff person who not only prepares the majority of this state's jurisdictional delineations but also serves as the primary enforcement official for the Section 404 program.

Such staffing limitations lead to frustration in the regulated community when applications must sit idle awaiting review, or, as in the case of the COE, an applicant may wait up to five months just to learn whether the COE has jurisdiction over their project area. This frustration has occasionally led applicants to the conclusion that it is better to take a chance on being caught in violation of the regulations (not likely due to limited enforcement personnel) rather than to take a chance on "surviving" the regulatory process.

Staffing to educate the public and landowners and provide technical assistance suffers from similar limitations. Agencies such as the SCS have the capabilities to provide assistance in the area of public education; however, staff is being reduced while responsibilities are being expanded.

If riparian protection measures are to be enhanced under the existing programs that operate within the State of Arizona, agencies will need to shift their priorities or additional funds to implement these programs will be necessary.

### **Uncertainty in the Regulatory Review Process**

In addition to the uncertainty that exists in the timeliness of the regulatory review process, there remains uncertainty with regard to the consistency of agency review, the lack of direction provided to the applicant, and the lack of differentiation between riparian areas of varying quality.

Often times, permit reviews are based more directly on the reviewer's individual perspective rather than a clear, agency-adopted perspective. This leads to the potential creation of "moving targets" as agency personnel turn over. By providing a clear sense of agency direction, as well as assisting applicants in preparing applications correctly the first time (rather than the traditional sequence of reviewing, requesting more information, reviewing, requesting more information....), much of the "fear" of the regulatory process could be eliminated. Reducing this "fear" would lead to a greater level of regulatory compliance.

Compliance could also be improved by more clearly identifying and modifying permit requirements for riparian areas of varying quality. Under existing conditions, impacts are often calculated on acreages of jurisdictional area "disturbed," rather than on the quality and functions of the jurisdictional area. This can lead to overly protective avoidance or mitigation measures in some areas and, conversely, overly lax measures in high quality riparian areas. In either case, due to the time and costs associated with completing the regulatory process, the majority of applicants would gain from a clearer definition of the areas where the resource agencies have determined that no impacts, or specific types of impacts, will be allowed.

### **Availability of Scientific Studies and Transferability to Riparian Management Measures**

A final constraint on existing riparian protection programs relates to the previously mentioned shift in the scientific perspective toward the environment. Within this context, the riparian issue is relatively new, especially in the Southwest. Previously, "riparian" vegetation types were referred to as "phreatophytes" and were viewed as a bane to water conservation efforts. As recently as 1964, the term "riparian" did not appear in the U.S. Department of the Interior's *Lower Colorado River Land Use Plan*.

Over time, the value of riparian ecosystems in arid regions has become more recognized, but we are still developing a comprehensive understanding of how these ecosystems truly function. There is much basic, riparian ecology research remaining to be completed, and such studies often raise as many questions as they answer. However, there now exists a far-ranging body of scientific opinion that identifies riparian ecosystems as regionally important and significantly threatened. Therefore, riparian research has increasingly shifted toward, and must continue to focus on, identifying and implementing ecosystem-based management techniques and strategies.

