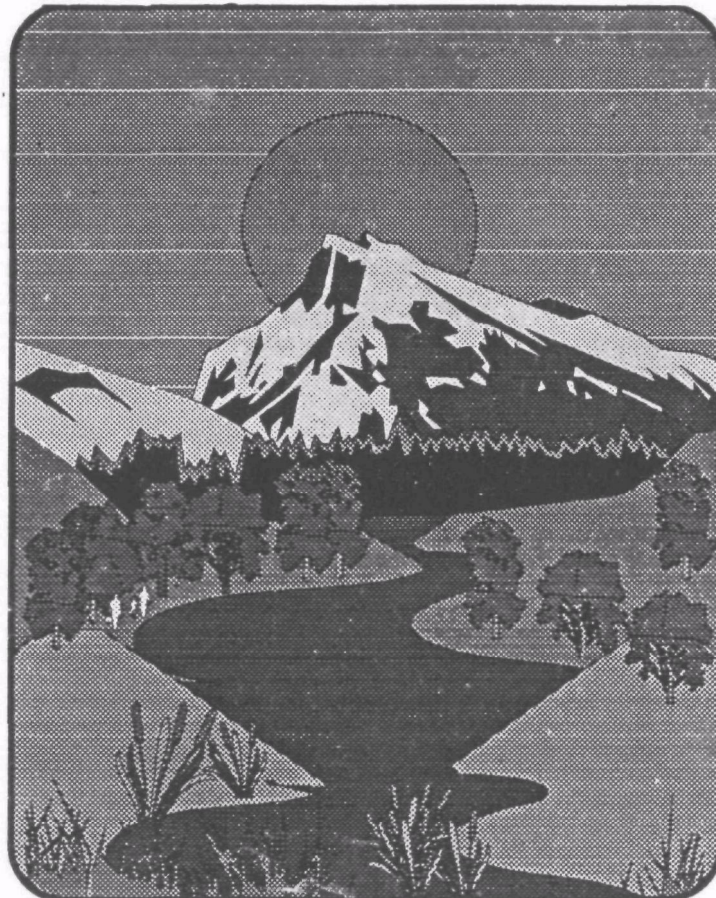




# Institutional Frameworks For Watershed Management Programs

## Profiles And Analysis Of Selected Programs



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**Institutional Frameworks for  
Watershed Management Programs**

**Profiles and Analyses of Selected Programs**

Prepared for the

**United States Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460**

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**February 1994**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, DC 20460



OFFICE OF  
POLICY, PLANNING AND EVALUATION

Dear Colleague:

There is growing interest across the country in using watershed-based water resource quality protection approaches. Private and public entities are joining together to achieve comprehensive water resource protection goals. Water suppliers have taken watershed planning approaches for reservoir maintenance, and for protection of drinking water supplies. States such as Florida have instituted Water Districts to coordinate water activities across traditional jurisdictional boundaries. The EPA has recognized the importance of watershed-based decisionmaking by championing its Watershed Protection Approach initiative.

Despite all the ongoing activity there is, however, a lack of information detailing how organizations currently accomplish watershed-based water resource quality management. We think this report provides a valuable baseline look at a number of different watershed entities across the country. It profiles organizations responsible wholly or partly for water quality, water supply and groundwater management. The assessment identifies the original missions of these watershed groups. It looks key factors such as the management techniques employed, sources of funding, partnership and management arrangements, and the role of the private sector.

We hope in the future to be able to expand the analysis found in this report to provide more detailed examinations of specific program elements that other watershed organizations can emulate. Suggestions for further areas of study are welcome. This is still a growing field of experience.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Ankrah".

Rodges Ankrah  
Water Policy Branch  
Office of Policy Analysis

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## **The Institutional Framework of Selected Watershed Management Programs: *Introduction and Overview***

Managing nonpoint sources of water pollution is a problem many people are attacking in different ways. The notion of pollution and sediment control has become an accepted part of public life, and there is more and more evidence that people are taking more personal responsibility for limiting their contribution to the pollution stream. This acceptance of responsibility is important to the future of nonpoint source control programs.

There is also a general awareness of the fact that the US Environmental Protection Agency (US EPA) cannot hope to build enough control systems to stem the flow of pollution into our rivers, stream, lakes, wetlands, estuaries and oceans. Given the public demand for pollution control and the recognition that there are not enough dollars around to take care of the problem (as we have with point source pollutants), technical experts and the public are both left wondering how one attacks a massive problem with not near enough money to solve it in the traditional way we have addressed point source problems.

The response has been to address the problem in nontraditional ways, and every interest group and unit of government has made its own contribution to these changes. EPA is proceeding with an integrated program known as the "Watershed Approach". The states either adopted this style before EPA did or due to the leadership of EPA. Other agencies without the regulatory power or construction funding of EPA have pursued conservation programs embodying watershed management by facilitating community-based planning approaches. The National Park Service has led the way in this effort.

Other agencies have developed their own methods to address water pollution problems stemming from their programs. For instance, the USDA Soil Conservation Service has produced the guide for planning and installing BMPs for agriculture that has been adopted for use in most states. Zoning authorities are adopting increasingly stringent comprehensive soil conservation plans to reduce erosion and runoff from land disturbance sites. River conservation plans use the control of nonpoint sources of pollution as the basis for many of the elements contained in their land use control plans. And many people are embracing plans to recreate natural systems to control pollution and soil erosion.

Other trends are also occurring. There is a movement to approach rivers as ecological systems, rather than as segments. The public is increasingly interested in taking part in direct, hands-on pollution control and restoration projects. There is more acceptance of the need to pursue the program that offers the best return per dollar of investment, even if that means adopting nontraditional, ecologically based approaches.

Given these little movements, how have the states, local units of government, and the private sector adapted their programs to control multiple sources of pollution? What programs actually operate on a watershed basis with a comprehensive program? Can these programs serve as models to be adapted elsewhere? What other programs implement parts of the

watershed agenda, and can those commitments be expanded to a more comprehensive approach? How can US EPA help these programs along? These are the questions addressed by this analysis.

### **Task Description/Purpose**

The purpose of this assessment is to inform EPA of the status of watershed planning in the United States. This report examines the multi-governmental management organizations responsible wholly or partly for water quality, water supply and groundwater management. The author produced profiles to identify and compare the operating and management characteristics of these agencies and the extent to which the mission has been realized.

The assessment describes the results and impacts of these plans and provides a basis for the future analysis of options and opportunities for involvement in watershed planning by the Environmental Protection Agency. This report offers a reasonable overview of what is going on in the area of watershed planning by multi-governmental jurisdictions across the country. The profiles show what has been done well, where there are gaps in planning, what is the quality of enforcement and implementation, and what are the relative levels of success.

### **Methodology**

The project was divided into three tasks. The first covered the collection and analysis of data on multi-governmental watershed planning organizations from around the country with an emphasis on agencies responsible for the combined management of water quality, water supply and groundwater. This analysis also identifies programs that were originally authorized to address other issues that now also include watershed management functions or water quality protection in their list of primary objectives.

The second covered the preparation of profiles of watershed management organizations, drawing from official documentation, outside assessments, and interviews with agency personnel. Emphasis was placed on preparation of profiles for organizations operating under unique models and a representative sampling of agencies operating according to common models. The profiles report on the following characteristics:

- |  |  |
|--|--|
| <input type="checkbox"/> Impetus for establishment             | <input type="checkbox"/> Mission statement   |
| <input type="checkbox"/> Year and method of establishment      | <input type="checkbox"/> Sources of funding  |
| <input type="checkbox"/> Key enabling and governance documents | <input type="checkbox"/> Management techniques   |
| <input type="checkbox"/> Comprehensive planning documents      | <input type="checkbox"/> Budget information  |
| <input type="checkbox"/> Representative projects               | <input type="checkbox"/> Methods of multi-governmental partnerships                        |
| <input type="checkbox"/> Nature and uniqueness of structure    | <input type="checkbox"/> Integration of water quality, quantity and groundwater management |
| <input type="checkbox"/> Assistance provided by US EPA         | <input type="checkbox"/> Level and status of implementation                                |

Data tables (Tables 1-7) were constructed for comparative purposes and this written analysis was prepared to assess the following variables:

- The geographic or hydrologic extent of the planning area and how boundaries were determined

- The range of key issues identified and techniques or solutions proposed to deal with them
- The extent and types of research done to support the plans
- How they were started, organized, managed, carried out and funded
- Techniques used for public involvement and coalition-building and the role of the private sector in planning, management, and long term implementation
- An estimate of what conditions are necessary for a successful partnership to emerge and the threshold beyond which this takes place

This assessment reviewed over one hundred programs in summary form and nearly sixty in more detail before concentrating on the twenty-nine programs for which profiles were prepared. Programs were sought from across the country that are watershed-oriented, cover a reasonably large management area (80 square miles or more), have a plan of management in place or nearly in place, and is substantially different from other programs selected for review. No national estuary programs were selected since information on those projects is readily available now. Appendix A. contains the individual profiles prepared on the twenty-nine programs.

## Findings

This assessment examined programs that address watershed protection from many different angles. Traditional pollution control programs, citizen-oriented programs, agricultural projects, river conservation programs, groundwater management programs, ecosystem protection programs, municipal utility providers, and others became part of this review. Eventually, they were sorted into four major groupings: (1) multi-state programs, (2) state programs, (3) regional programs, and (4) individual river or watershed projects. Some of the programs selected are not effective models for action, but they are effective representatives of classes of programs across the country that cannot contribute to watershed management activities without fundamental changes in their organizations.

### Overview of Programs

While there is general technical agreement on what constitutes a watershed, there is little or no agreement on what constitutes a watershed management organization. For the purposes of this analysis, a watershed management organization ideally possesses a breadth of characteristics:

- Its geographic scope and focus of activity is on an entire watershed or subwatershed and is sufficiently large (80 or more square miles) to be valuable as a federal or state model
- It is comprehensive in nature; that is it concentrates on as wide a range of water resources management and protection as possible, including:
  - management of water resources development
  - water conservation
  - water quality management
  - groundwater management and protection
- It has an ecosystem approach, an intentional management strategy that relates the health of one area of the watershed to the remaining parts:
  - management and protection of riparian zones
  - holistic approach to environmental management
  - the provision of habitat corridors
- It is not primarily concerned with point source discharges
- It includes a program for the control of nonpoint sources of water pollution, including the following techniques:
  - employs structural and nonstructural techniques
  - encompasses rural and urban environments
  - supported by good science and scientific practice
  - addresses all major nonpoint source dischargers
  - protects groundwater and surface water
- It has the financial and legal or statutory capabilities with which to implement and enforce its plan of management
- For the purposes of this analysis, it has a plan of management in place by which to evaluate the program

This analysis looked into nearly one hundred programs on a preliminary basis before settling on twenty-nine for profiles. Many programs, especially nonprofit organizations, say they are watershed organizations, but few are able to deliver services close to the criteria described above. What is true is that more organizations are developing a watershed outlook. This is an awareness and acknowledgement of the need for watershed management, even if they do not have the capability to deliver watershed services.

In fact, none of the programs fit the mold perfectly but all offer some elements of the ideal program. All possess some of the elements of a watershed-oriented program. The common thread in most of these programs is the control of nonpoint sources of water pollution. The on-site management programs identified are strongly oriented to the control of stormwater runoff, soil conservation, and the control of nonpoint sources. The land use controls identified do the same. Acquisition programs favor the protection of habitat or riparian zones. Other permitting programs are generally oriented toward the control of nonpoint sources. In fact, the corridor and land conservation programs reviewed base their land use ordinance provisions in large part on pollution prevention and soil conservation. Coupled with the fact that small watershed programs in the past have been oriented toward soil conservation and pollution control, it is not surprising that many of the best programs profiled are nonpoint source control programs.

What follows is a capsule description of each of the programs selected for review. A map showing their location is included on the following page as Figure 1. Figure 2 shows the state level programs that were reviewed.

The multi-state programs chosen for review are:

1. Delaware River Basin Commission—Delaware River—This is a multi-state program that is fully watershed-oriented. The Commission has permitting authority over point and nonpoint sources and for water resources development. It is tracking groundwater withdrawals although it does not yet regulate them. Given the need to protect national interest resources (the Upper and Middle Delaware Wild and Scenic River segments), the Commission is increasingly concerned with nonpoint source pollution.
2. Interstate Commission for the Potomac River Basin—Potomac River—The ICPRB was started by federal compact to address pollution problems in the Potomac River. This Commission has no permitting power, but it has a strong research and technical support capability, and it is watershed-oriented.
3. Ohio River Sanitation Commission—Ohio River—ORSANCO focuses primarily on the Ohio River main stem, and primarily on point source dischargers. It uses its review and approve powers on point source discharge only when necessary. It does coordinate the activities of several affected governments.



**Figure 1.**  
**Watershed Programs Selected for Review**





### Figure 2.



**The state programs chosen for review are:**

1. **Arizona Active Management Area Program**—The Arizona program is exclusively oriented to groundwater. It maintains controls on withdrawals and recharges.
2. **Maryland Chesapeake Bay Critical Area Commission**—Commission programs extend back from the Bay only 1,000 feet, but the program is an example of the tools and techniques that can be employed within that area to control nonpoint sources.
3. **Nebraska Natural Resource District Program**—Nebraska's NRDs are responsible for many aspects of water resources management. With their strong farm orientation, they have several programs aimed at controlling runoff from farm operations.
4. **Wisconsin Nonpoint Source Pollution Abatement Program**—The Wisconsin program has been in place since 1979. Nearly 60 watersheds have been designated as priority watersheds, and planning and implementation is complete on many of them.
5. **Vermont Nonpoint Source Pollution Control Program**—The Vermont program, still new, provides a straightforward implementation of EPA's nonpoint source rules under the Clean Water Act Amendments of 1987. It is priority watershed based, supported by good science, and given the state's ability to control land use, it should have a successful and comprehensive nonpoint program.

**The regional programs chosen for review are:**

1. **Cape Cod Commission—MA**—The Cape Cod Commission demonstrates the marriage of sole source aquifer protection and performance zoning. The Commission also demonstrates strong permit approval capabilities, and the value of on-staff technical expertise in surface and groundwater hydrology.
2. **New Jersey Pinelands Commission—NJ**—The Pinelands program is worth looking at because it aims to control water quality in groundwater and surface water in ways different than how everyone else does it. This program has unusually strong regulatory authority. It is a good example of the potential for marriage of pollution control and land and riverine protection programs.
3. **Northwest Florida Water Management District—FL**—This is one of three Florida Water Management Districts chosen for review. Northwest Florida WMD is a good example of water quality management for terrestrial and marine purposes.
4. **Phoenix Active Management Area—AZ**—The Phoenix AMA is one example of the overall Arizona state program.
5. **South Florida Water Management District—FL**—The South Florida WMD is a valuable insight into nonpoint source management in complicated and sensitive ecosystems. It employs a comprehensive set of rules for nonpoint control.

**The river or watershed programs chosen for review are:**

1. **Anacostia River—MD and DC**—The Anacostia Watershed Restoration Committee is a useful study of nonpoint source management in an urban, built environment. It is also exclusively project based.

2. **Barnegat Bay Estuary Program—NJ**—The Barnegat Bay plan, while still in the review stages, is a good example of a comprehensive plan for land and water that has strong connections to nonpoint management. This is a state-local-private program.
3. **Black Earth Creek Priority Watershed Project—WI**—Black Earth Creek is an important trout stream that benefits from designation as a priority watershed. This plan addresses agricultural and urban nonpoint sources, and fishery enhancement.
4. **Grande Ronde Critical Basin Project—OR**—The Grande Ronde project is an Oregon project that shows the two-stage process of the Oregon DEQ's critical basin process.
5. **Guadalupe-Blanco River Authority—TX**—This is one of the twenty-three Texas river basin authorities. Authorized by the Texas legislature in the 1930's, this system of basin authorities covers the entire state. These agencies do not have a strong nonpoint source mandate, but they are good examples of how basin management works in the Southwest.
6. **Menomonee River Priority Watershed Project—WI**—The Menomonee is a Wisconsin priority watershed that encompasses both rural areas and Milwaukee suburbs. The most recent of nearly sixty plans completed since the program's inception in 1979, the plan is a current example of how the priority watershed program addresses agricultural nonpoint sources, urban housekeeping practices, and urban stormwater management.
7. **Middle Fork River—WV**—This is a pilot project for the control of acid mine drainage. It is a cooperative project between federal and state agencies. It is the only program profiled that addresses mine drainage control.
8. **Mississippi Headwaters Board—MN**—Upper Mississippi River (above St. Paul)—The Mississippi Headwaters Board protects the upper 400 miles of the Mississippi River. It works like but is not a scenic river. With a 1,000-foot from each bank protection corridor, it protects about 200 square miles of land and water. Its updated plan is an example of local ordinances backed up by enforcement mechanisms.
9. **Nisqually River Council—WA**—The Nisqually River was identified twenty years ago as a river of statewide significance by the state shorelands study. Draining the west side of Mount Rainier, flowing through Fort Lewis, and emptying into Puget Sound through a national wildlife refuge, the river is largely undisturbed in many reaches. A large partnership works together to protect the river, using land management and nonpoint source techniques.
10. **Lower East Branch Pecatonica River Priority Watershed Project—WI**—This is a Wisconsin priority watershed that demonstrates fully the use of agricultural BMPs in a multi-county environment. The cost-sharing arrangements and educational requirements that are part of this program are quite detailed.
11. **Puget Sound Water Quality Authority—WA**—The Authority has enacted a wide-ranging comprehensive plan that is implemented on a voluntary basis by dozens of state agencies, counties and municipalities. The state enabling legislation requires affected counties and municipalities to adopt applicable parts of the comprehensive plan into their own laws, plans and ordinances so that future actions are consistent with the legislation. Consistency is required, but there is no clear enforcement mechanism if local political subdivisions fail to take appropriate action. State agencies are encouraged to act consistently with the legislation and comprehensive plan.



12. Suwannee River Water Management District—FL—The Suwannee program employs land acquisition and forest management techniques to control nonpoint sources and protect the watershed. Silviculture BMPs are required for any forestry permit.
13. Sweetwater Authority—CA—The Sweetwater Authority was ordered to prevent upstream nonpoint pollution from degrading one of its water supply reservoirs. The Authority is not a watershed management agency *per se*, but it is required by the state water quality board to protect its reservoir from urban pollution.
14. Tualitan River Critical Basin Project—OR—It demonstrates a combination of land use controls, agricultural and silvicultural BMPs, and tightened up TMDLs on point source dischargers. The City of Portland and the regional stormwater management agency are required to implement the regulations through land use controls or changes in management practice. The state Department of Forestry further contributes to the project with a pilot silviculture management plan.
15. Upper Delaware Scenic and Recreational River—NY—PA—The Upper Delaware is part of the National Wild and Scenic Rivers System. Due to conflicts between Pennsylvania and New York land use laws, the zoning program for the project is based heavily on pollution prevention from nonpoint sources and on soil conservation objectives. It is the best example of the use of land use control techniques for water quality protection in the National Wild and Scenic Rivers System. The program has strong water quality and fishery objectives.
16. Watershed Committee of the Ozarks—MO—This group is a nonprofit organization whose members are the City of Springfield, Greene County, and the local utility company. The watershed committee approaches watershed protection from the angle of advocacy and coordination. It uses no regulatory programs, except for its ability to guide local land use decisions and to provide leadership in the community. It features excellent educational programs.

### ***Impetus for Establishment***

Watershed programs have been around the agricultural community for years. Programs have been aimed at small watersheds for soil conservation, flood control, water supply, and increasingly, pollution control. Programs for river corridor conservation have pointedly not been watershed-oriented until quite recently, the consensus being that applying park-like management strategies to such vast areas would cause havoc with property owners, developers, commercial interests and local governments. Nonpoint source watershed programs have also been rare, in part due to the nation's difficulty in addressing the nonpoint control concepts.

The most common denominator is that twenty of the programs reviewed for this report were initiated wholly or partly by the states. Five were initiated by congressional action. Of the twenty-nine programs, only half began as programs devoted primarily for nonpoint source control. Seven programs, the Florida water management districts, the Texas river authority, and the Arizona Active Management Areas, operate primarily as water resources management programs. As awareness grew of the delicacy of Florida's ecological balance, the water management districts have drawn up more aggressive water quality programs.

The Pinelands, Mississippi Headwaters Board, and Upper Delaware are the land and riverine conservation programs with the strongest connection to the control of nonpoint sources. The structure and planning processes of these programs is similar to that used in Wisconsin and by the Nisqually River Council. This is a system based partly on a strong local planning but with implementation guaranteed by a more powerful higher authority.

The pattern that emerges is that there are very few programs that are truly watershed oriented, although the states are steadily moving in that direction. Table 1 summarizes the formation of each program.

**Table 1.**  
**Watershed Management Programs**  
***Institutional History and Program Impetus Table***

Program	State(s)	Year Started	Year Mgmt. Began	Impetus to Initiate Program
<b>Multi-State Programs</b>				
Delaware River Basin Commission	DE,NJ, NY,PA	1961	1961	Litigation--NJ v NY--Supreme Court required minimum flow at northernmost NJ gauge; DRBC born out of agreement to coordinate water resources management
Interstate Commission on the Potomac River Basin	MD,VA, WV	1940	1940	Interstate concerns over flood and drought cycle; need for water supply
Ohio River Valley Water Sanitation Commission	14 States	1948	1948	Concerns over interstate pollution problems; need for waste treatment plants
<b>State Programs</b>				
Arizona Active Management Areas	AZ	1980	1980	Arizona Groundwater Management Act of 1980 passed to address problem of over-withdrawal from groundwater
Chesapeake Bay Critical Area Commission	MD	1984	1985	Part of comprehensive Maryland response to pollution and wildlife damage in Bay
Nebraska Natural Resource Districts	NB	1972	1972	Need to coordinate and consolidate overlapping and contradictory authorities among 154 varying districts
Wisconsin Nonpoint Source Water Pollution Abatement Program	WI	1978	1979	Enacted by Wisconsin legislature
Vermont Nonpoint Source Management Program	VT	1988	1989	Response to Clean Water Act Amendments of 1987
<b>Regional Programs</b>				
Cape Cod Commission	MA	1990	1990	Voter and legislature approved initiative
NW Florida Water Management District	FL	1972	1972	Legislature approved plan to address flood/drought cycle and need for water supply
New Jersey Pinelands Commission	NJ	1978	1981	State/federal response to development pressures
Phoenix Active Management Area	AZ	1980	1980	Arizona Groundwater Management Act of 1980 passed to address problem of over-withdrawal from groundwater
South Florida Water Management District	FL	1972	1972	Legislature approved plan to address flood/drought cycle and need for water supply



**Table 1. (Continued)**  
**Watershed Management Programs**  
*Institutional History and Program Impetus Table*

Program	State(s)	Year Started	Year Mgmt. Began	Impetus to Initiate Program
<b>River and Watershed Programs</b>				
Anacostia Watershed Restoration Committee	DC,MD	1987	1987	State/federal response to pollution and degradation—easily visible national model
Barnegat Bay Watershed Plan	NJ	1992	Not started	Response to industrial spill in bay
Black Earth Creek Priority Watershed	WI	1985	1989	Enacted by Wisconsin legislature
Grande Ronde Critical Basin Project	OR	1991	Mid-1993	Litigation by environmental groups against EPA
Guadalupe-Blanco River Authority	TX	1935	1935	Legislative response to flood/drought cycle
Menomonee River Priority Watershed	WI	1984	1992	Enacted by Wisconsin legislature
Middle Fork River Watershed Pilot Project	WV	1991	1994	Pilot program to address acid mine drainage and related problems in watershed
Mississippi Headwaters Board	MN	1980	1982	Initially a program to control development to protect water quality; later a local response to federal controls
Nisqually River Council	WA	1985	1987	Shorelands Act identified river as of "statewide significance" in 1972; coordinated response to manage large public and private land holdings
Lower East Branch Pecatonica River Priority Watershed	WI	1989	1991	Enacted by Wisconsin legislature
Puget Sound Water Quality Authority	WA	1985	1989	Response to rapid development in watershed; desire not to permit sound to degrade to levels of eastern bays
Suwannee River Water Management District	FL	1972	1972	Legislature approved plan to address flood/drought cycle and need for water supply
Sweetwater Authority	CA	1978	1978	Upstream growth in municipal water supply watershed
Tualitan River Critical Basin Project	OR	1989	1990	Litigation by environmental groups against EPA
Upper Delaware Scenic and Recreational River	NY,PA	1978	1988	Initially a program to control development to protect water quality; later a local response to federal controls
Watershed Committee of the Ozarks	MO	1987	1987	Upstream growth in municipal water supply watershed

The most interesting exception to this trend has been the Wisconsin nonpoint program. Approved by the state legislature in 1978 and supported by a voter-approved bond program (The Wisconsin Fund), the program has gained increasing focus over the years and now covers sixty watersheds 100-300 square miles in size. New priority watersheds are added almost every year by the legislature, to begin an eight year process of assessment, contracting, installation and monitoring in each watershed<sup>1</sup>.

Also differing from most of the programs represented in this analysis are the groundwater programs, in this review represented by the Cape Cod Commission and the Arizona Active Management Areas. The Cape Cod Commission is primarily a regional planning commission with powers vested in it by the Commonwealth and by the municipalities in its one county service area. Due to the Cape's location on the Atlantic Ocean and its dependence on a small aquifer for all water supply, the Commission maintains an active and sophisticated water resources program that has defined strong pollution control policies and regulations through a system of performance zoning aimed at the protection of sensitive areas such as wellheads, recharge zones, and potential water supply source areas. These environmental factors were important in voter and legislative decisions to give the Commission additional authority to review and approval of local plans and permits.

**Conclusions.** Three programs are reviewed here that were established specifically to deal with nonpoint problems. They are the the Wisconsin Priority Watershed Program, the Vermont priority watershed program, and the Oregon critical basin projects. The programs in Vermont and Oregon have come about only in the past five years, due to Congressional action on the Clean Water Act Amendments or due to litigation. Wisconsin began its program nearly fifteen years ago as part of an overall effort to stem water pollution. Relative to the state's point source program, it is a poor stepchild. Relative to the investments made in most other states, it is a well-funded, aggressive program.

The other programs sprung up due to unique environmental conditions in their respective regions. The Upper Delaware Council acted to protect a clean and free-flowing river. The Cape Cod Commission took action to protect its sole source aquifer. Arizona acted out of concern for pollution and groundwater shortfalls. The Barnegat Bay plan grew out of a settlement between the State of New Jersey and a corporation guilty of polluting the Bay.

These programs have built-in advantages and disadvantages to EPA in watershed management. They already exist, have professional capabilities, and have passed the test of time. Existing systems can be built up to address watershed management more thoroughly. The disadvantage is that these programs have grown out of local environmental conditions, and may not be as easy for EPA or states to start in other areas.

There are several programs that have similarities to regional councils or councils of government (COGs). COGs are formed by two or more local jurisdictions to carry out some public purpose or provide a government service on a combined basis. COGs are frequently formed to provide services such as public transit, municipal waste collection and disposal,

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<sup>1</sup> The nonpoint program is the minor part of the voter-approved fund, the larger balance being allocated to pollution control at point source sites

wastewater treatment, mental health facilities and many other functions. COGs are an excellent means for providing common services across jurisdictional boundaries and for sharing services that otherwise would be too expensive for one jurisdiction to manage. Known as joint powers boards in some states, COGs only have as much or as little authority as the members jointly agree to give them. For instance, one regional planning commission may have review and approve powers over municipal zoning decisions, while another one may not. They may also have taxing authority or the authority to issue bonds. The ease with which such bodies may form varies greatly from state to state, and whether the state itself can be a member of a COG also varies greatly.

The Upper Delaware Council, the Mississippi Headwaters Board, the Nisqually River Council, and the Cape Cod Commission operate much like COGs, and all but the Upper Delaware Council have the special legislative provisions that enable them to operate in some ways like COGs. Only the Cape Cod Commission covers the entire watershed. It is likely that few existing COGs or regional councils are organized on a watershed basis, making them potentially poor choices absent other authority to lead watershed planning projects. The better choice is to build more watershed management capabilities within the responsible state agencies and have them organize through MOUs or special legislation affected political subdivisions into watershed management groups.

### ***Strategic Focal Points***

The programs surveyed fall into several distinct groups, each with their own primary purposes. Groupings include:

- Groundwater programs such as that employed by the Cape Cod Commission and the Arizona Active Management Areas which seek to manage both groundwater withdrawals and recharges
- Programs such as those in Vermont and Wisconsin which work to meet state water quality standards while also protecting and enhancing aquatic diversity
- Programs that protect urban water supplies such as those of the Sweetwater Authority in California and the Watershed Committee of the Ozarks in Missouri
- Programs that implement water quality objectives as part of larger landscape or riverine protection systems such as the Nisqually River Council, the Mississippi Headwaters Board, the Upper Delaware Council, or the New Jersey Pinelands Commission
- Special districts implemented by state legislatures that originally addressed flood control, irrigation or water supply needs, but which now also concentrate on pollution control such as the Florida Water Management Districts, the Texas River Authorities, or the Nebraska Natural Resource Districts
- Interstate compacts established to address water pollution problems such as the Interstate Commission for the Potomac River Basin or the Ohio River Valley Water Sanitation Commission
- State programs planned to protect bays and embayed areas such as Barnegat Bay or the Chesapeake Bay Critical Area Commission in Maryland

These programs tend to be concerned about the same potential pollutants — sediment, phosphorus, and nitrogen-nitrates. Concerns were expressed in some programs regarding dissolved oxygen and temperature. Other chemical and biological factors were expressed less often.

The state water quality programs in Oregon, Wisconsin and Vermont used similar evaluation systems to determine which streams in the state are priority watersheds. The system for evaluation used in Wisconsin is a fair example of this process.

The Wisconsin Priority Watersheds Program deals with entire watersheds on a selective or priority basis and strives to control every significant source of nonpoint pollution in these watersheds.

The purpose of the program is to control nonpoint source pollution in a systematic manner so surface and groundwater quality goals can be accomplished within a reasonable time frame. The program is designed to deal with the wide variety of nonpoint sources that exist throughout the state including sediment from croplands, construction sites, stream banks, and grazed woodlots; nutrient loads from barnyard runoff, cropland runoff, manure spread on croplands, and runoff from city lawns and streets; and heavy metals and other toxic substances in stormwater runoff from various urban sources.

Wisconsin DNR uses six selection criteria to select priority watershed projects. They are:

1. Severity of the water quality problems
2. The magnitude of the pollutant load and potential for significant reduction
3. Willingness of landowners to participate
4. Willingness of local government to participate
5. Willingness and capability of local government to control nonpoint pollution; for instance, their willingness to enact erosion control ordinances for construction sites
6. Potential public use and benefits that will result from the project

The program is coordinated with the state Department of Agriculture, Trade and Consumer Protection. The watershed project covers an eight to nine year period. Following approval of the watershed plan, three years are allotted to recruiting landowners to participate and enter into agreements to install the practices. They then have up to five years to install the BMP systems.

**Conclusions.** Wisconsin has developed a system that it has used successfully nearly sixty times. It is a cooperative process that lures in local governments with 100% financing and people who would install BMPs with 50% to 70% financing. Increasing the participation rate among the targeted land operators means increasing the percentage of cost the government is willing to shoulder.

## **Geographic Scale**

The geographic scale of these programs varies greatly. Ten of the twenty-six programs profiled were less than 200 square miles in area. Another ten ranged in area from 4,000 to 18,000 square miles. The Ohio River Valley Water Sanitation Commission led the way with eight states and 203,000 square miles.

The programs concentrating on small areas are able to address nonpoint issues one landowner at a time if need be, while the smallest unit the larger areas can address is at the level of individual point source dischargers. Nonpoint programs appear to be effective in areas up to 300 square miles in size.

Programs addressing larger areas appear to go in two directions—providing the broad brush controls of zoning and education, or combining this system with additional programs aimed at specific sources. For instance, the Cape Cod Commission enforces an intricate performance zoning system that seeks to protect the county's sole source aquifer by sharply limiting discharges in various subregions such as wellhead protection zones and aquifer recharge zones. Under performance zoning, a land use is not judged according physical parameters (size, setback, etc.) but by whether it can meet certain tolerance thresholds (in this case, 5 ppm nitrate-nitrogen loading for impact on groundwater).

The Grande Ronde Critical Basin Project in Oregon uses a two-stage approach. It first attempts to eradicate the river's "water quality limited" status by assigning total maximum daily loads (TMDLs) to existing point source dischargers to further reduce specific pollutant levels from their daily discharges. If this fails, the next step will be for the state Department of Environmental Quality to enact regulations to limit discharges from prominent nonpoint sources, notably timber harvesting and agriculture in this region.

This review also examined two small management areas in which the aim was to protect the quality of urban water supplies in municipal reservoirs. Even in small watersheds, costs can vary dramatically. The Watershed Committee of the Ozarks is a nonprofit organization whose members are the City of Springfield, Missouri, Greene County, and the municipal utilities. The Committee is a low-cost effort to encourage non-polluting uses of the watershed above the reservoirs without the use of regulations or what some people refer to as an "added layer of government" with its own regulatory authority. There are few costs but no guarantees.

Conversely, the Sweetwater Authority is the municipal water supplier for Chula Vista and National City, suburbs of San Diego, California. It was organized in 1978 and took over management of waterworks from private suppliers. Upon taking over, the California Water Quality Control Board ordered it to control inflows to one of its reservoirs from upstream development. Fifteen years and several million dollars later, the \$9.1 million project to route polluted flows around the reservoir is recently underway. The Authority is attempting to get upstream developers and landowners in a small drainage area to pay for the improvements and to limit further polluted runoff from their lands.

The New Jersey Pinelands Commission is a good example of the second direction for larger areas. It combines a strong zoning program—covering seven counties and 53 municipalities—with additional controls (septic system standards, special protection zones) to protect the aquifer and sensitive terrestrial areas. The Commission is well on its way to

purchasing 100,000 acres in its 1.1 million acre management area, and it uses transfers of development rights (TDRs) to further concentrate development away from sensitive zones. Alternatively, the South Florida Water Management District is seeking to control the flow of phosphorus into Lake Okeechobee by buying out cattle from ranchers (49 ranches with over 15,000 head of cattle) and by developing a constructed wetland 3,700 acres in size to filter out phosphorus from agricultural and urban flows.

The size of the management area has substantial implications for EPA. Focusing on small watersheds in rural areas can have a significant impact on water quality and the fishery without excessive cost. However, over 15,000 such projects of 200 square miles or less could fit into the land area of the continental 48 states. Given that the average small project reviewed in this study cost about \$3 million, coverage of all rural areas would cost \$45 billion, not counting urban controls, the advance assessments, operation and maintenance, management, enforcement, and monitoring. This will present challenges to EPA in defining the appropriate scopes of future watershed management programs.

The USDA's Soil Conservation Service (SCS) has been operating a small watersheds program for many years. The program has local extension offices in most U.S. counties and has developed a strong tradition of working closely with the agricultural community on soil conservation, pollution control, flood control and water supply projects. One of the traditions in the SCS operation is that projects on private property are cost-shared, usually with a 50%-70% federal match. Usually, a goal of 50% to 75% participation by farmers is built into budget models. Given this history, it is not likely that a program with more than 30% to 50% private cost-sharing would be successful for future rural watershed plans.

*Conclusions.* The small programs appear to work well in rural and agricultural areas, but using them as the model could result in prohibitive expense. Urban drainages would still have to be addressed separately.

### ***Mechanisms for Intergovernmental Cooperation***

Twelve of the twenty-nine programs selected for review feature strong state-local cooperative relationships as the basis for implementing the programs. Seven of these programs provide for voluntary participation by local governments only in setting up watershed management programs. Five have state enabling legislation that either require local governments to conform to the program or which say that state agencies will carry out specific management actions if local governments fail to do so.

Two Washington programs—Puget Sound Water Quality Authority and the Nisqually River Council—were established by the state legislature as coordinating and advocacy bodies without the power to require local governments to take specific actions, although each has responsibility for coordinating implementation of comprehensive plans. The legislature did direct participating state agencies to develop complementary or consistent plans with these programs. Both programs employ a cooperative planning process in which all affected units or agencies of government and private sector interests are represented on the planning committee.



The programs for the Tualitan and Grande Ronde Critical Basin Projects in Oregon work in a different way. The legislature adds priority watersheds to the list and directs the Department of Environmental Quality to prepare a plan that establishes a Total Maximum Daily Load (TMDL) for the stream and for each identified point source discharger. The Tualitan plan requires local governments and one special service agency to use their existing powers to address the problems. This first includes reducing the TMDLs from existing waste treatment facilities. If this step is not fully successful in meeting water quality goals, then land use controls can be put into place by the state land planning agency. Some cooperative projects have been added to the program as demonstrations or pilots.

The Grande Ronde, still in its early stages, covers an area twenty times larger than the Tualitan basin. TMDL plans will be coordinated with several other plans and studies now underway on the river system. The river is a study component of the National Wild and Scenic Rivers System, and it is a designated component of the Oregon Scenic Waterway Program. Both programs use nondegradation as their resource management standard. Several state and federal agencies have banded together on two other programs—the Northwest Power Planning Council's Grande Ronde Model Watershed Program and the Upper Grande Ronde Anadromous Fish Habitat Restoration Program, a project proposed by freshwater biologists from the USDA Forest Service and other scientists that is being considered under the NEPA process as an amendment to the national forest plan for the region.

The model watershed program is an effort by the Northwest Power Planning Council to mitigate damages caused by dam construction in the Columbia River Basin. The Council has established one model river in each of the three primary Columbia basin states—Washington, Oregon, and Idaho—for which to design a restoration program for anadromous fish species. The Council is working to coordinate the activities of all major agencies and units of government on the restoration program in the Grande Ronde basin. Restoration work will be funded in part by the Bonneville Power Administration.

It is likely that these programs will be coordinated with Oregon DEQ's Critical Basin Project during the next two years. This will most likely occur through execution of a Memorandum of Understanding.

The Wisconsin priority watershed program is a voluntary, cooperative system in which the Department of Natural Resources does not designate a stream as a priority watershed unless local governments and sufficient numbers of targeted property owners or operators indicate in advance their willingness to participate in the program. A contract is executed between the state and the counties and municipalities for the assessment and then for the implementation work. The state pays 50% to 75% of the cost of installation of the practices and 100% of the cost of local government participation. This system helps to maximize the value of the limited dollars the agency has available for the program.

The Wisconsin program also features one other cooperative system worth examining. The state and federal agencies, counties and the University of Wisconsin Extension cooperate in the preparation of discrete layers of information to be added to and interpreted by the statewide geographic information system, known as CONSOIL. Three federal agencies, three state agencies, the affected county(ies), and the University collaborate on this natural resources database by sharing information layers.

**Conclusions.** The managers whom the reviewers interviewed generally agree that implementing comprehensive watershed programs is a time-consuming, labor-intensive process that requires a large amount of personal interaction between project managers, local governments, private entities and citizen groups. Having sufficient funding to put a sufficient number of state water quality personnel out in the field will be important to the success of future programs. Providing them with sufficient training in negotiating these agreements, both with local governments and with property owners, will be the next step.

Third, the Wisconsin, Vermont, Washington, and Oregon nonpoint programs appear to have effective processes, but they do not integrate land use powers into the system very well. The Chesapeake Bay Critical Area Commission does an outstanding job of this, but its powers are so broad and of such a top-down nature that it is unlikely to be duplicated anywhere else.

Watershed program managers would do well to examine how land use powers protective of water quality have been integrated into state and federal river and land conservation plans. Good examples are the Mississippi Headwaters Board, the Pinelands Commission, and the Upper Delaware Scenic and Recreational River. Working closely with the state scenic river coordinators is a good first step. These people have experience in building these kinds of intergovernmental and private property owner agreements.

### ***Funding Sources and Budget Information***

These programs differ markedly in their sources of funding and budget allocations. The techniques employed also contribute greatly to the diversity of budget levels. Table 2. shows the base funding, special grants, and total budgets with sources for the programs profiled.

**Base Funding and Sources.** The state and regional programs draw base funding from state legislative appropriations, voter approved special bonds (Wisconsin Fund, Washington Centennial Clean Water Fund, New Jersey Green Acres Fund), property tax levies (Nebraska Natural Resource Districts), and ad valorem taxes (Florida Water Management Districts). Base funding levels range typically from \$100,000 to \$5 million per program.

The exceptions are the Nebraska system, the South Florida Water Management District, the Guadalupe-Blanco River Authority, and the Sweetwater Authority. In Nebraska, the twenty-three districts take in a combined property tax total of \$360 million, or an average of about \$15 million per district.

South Florida takes in over \$117 million in ad valorem taxes, funds used for operations, monitoring, planning, project implementation, and land acquisition. This area has special environmental challenges, which make it unfair to compare to other situations, even in Florida. The Guadalupe-Blanco River Authority uses its funds from service and utility fees to build and maintain systems and provide services for water supply, flood control, irrigation, and wastewater treatment. Its portfolio of projects is worth hundreds of millions of dollars. The Sweetwater Authority budget listed in Table 2. is the amount budgeted to construct a runoff diversion to protect a water supply reservoir. It is useful in that it shows some of the potential costs of having suburban nonpoint sources foul water supplies in urban environments.

Three programs reviewed have active land acquisition programs for watershed protection. Preservation 2000 is a combined acquisition program in the State of Florida for the protection of wetlands, rivers, coasts, the Everglades, recreation lands, rails-to-trails corridors, and other areas. Since 1981, the Save Our Rivers program, enacted by the legislature as The Water Management Land Trust Fund, one of eight programs now encompassed by Preservation 2000, has been the source of funding for the acquisition of 51,885 acres for \$42,374,762 in the Suwannee River Water Management District and 156,178 acres for \$113,504,481 in South Florida. Funds from Congress and the New Jersey Green Acres bond, a voter approved bond, have been the source for the acquisition of 63,400 acres in the New Jersey Pinelands, totaling nearly \$50 million.

None of the programs reviewed lists separable costs for fish habitat restoration although the Black Earth Creek Priority Watershed in Wisconsin and the anadromous fish restoration project on the Grande Ronde in Oregon include habitat restoration as project purposes.

**Table 2.**  
**Watershed-Oriented Nonpoint Source Water Pollution Control Programs**  
**Budget and Sources of Funding Table**

Program	Base Funding	Source	Special Grants	Source	Total Budget	Remaining Sources
<b>Multi-State Programs</b>						
Delaware River Basin Commission	1,834,800	Member States	240,000	EPA CSO study	2,674,728	Fines; DOI; miscellaneous
Interstate Commission on the Potomac River Basin	766,953	Member States	1,417,901	EPA, COE, States	2,269,957	Miscellaneous
Ohio River Valley Water Sanitation Commission	811,875	Member States	379,825	EPA 106 Grant	1,454,168	Interest and Miscellaneous
<b>State Programs</b>						
Arizona Active Management Areas	<1,000,000	AZ Dept. of Agriculture			<1,000,000	
Chesapeake Bay Critical Area Commission	1,100,000	Legislature	800,000	EPA CZM Grant	1,900,000	CZM is pass through for local planning purposes
Nebraska Natural Resource Districts	360,000,000	Property tax levies	40,000,000	\$8 million from federal	400,000,000	Divided among 23 districts
Wisconsin Nonpoint Source Water Pollution Abatement Program	4,000,000	Wisconsin Fund-voter approved special fund		Some projects assisted by EPA 319 grants	4,000,000	Fund does not pay for urban CSO and re/detention systems
Vermont Nonpoint Source Management Program		VT General Fund	650,000	EPA 319 grant; also 205j and 604b grants		
<b>Regional Programs</b>						
Cape Cod Commission			350,000	Federal & state grants	350,000	
NW Florida Water Management District	1,022,816	Ad Valorem Taxes	198,441	4 federal grants	9,164,524	State & Local contracts (\$6.4 million)
New Jersey Pinelands Commission	2,300,000	State appropriations	15,000	Federal contract	2,491,500	Interest income
Phoenix Active Management Area		State appropriations				Fees on groundwater withdrawals
South Florida Water Management District	117,169,639	Ad valorem taxes	24,993,824	Intergovernmental funds	155,952,021	Interest, permits, and other

Table 2. (Continued)  
Watershed-Oriented Nonpoint Source Water Pollution Control Programs  
Budget and Sources of Funding Table

Program	Base Funding	Source	Special Grants	Source	Total Budget	Remaining Sources
<b>River and Watershed Programs</b>						
Anacostia Watershed Restoration Committee	***		***		***	Projected funded as part of overall budget for ICPRB; see above
Barneгат Bay Watershed Plan	***		***		***	Plan provides no funding
Black Earth Creek Priority Watershed	2,563,500	Wisconsin Fund			2,726,964	Locals pay \$328,714
Grande Ronde Critical Basin Project	Staff/overhead	Oregon DEQ			***	No separable costs estimated
Guadalupe-Blanco River Authority	13,000,000	Service revenues			13,000,000	Service revenue only; no tax funds
Menomonee River Priority Watershed	898,584	Wisconsin Fund			1,053,852	Locals pay \$155,268
Middle Fork River Watershed Pilot Project			5,000,000	EPA 319 & 106		All funding so far from EPA
Mississippi Headwaters Board	800,000	State and counties			800,000	Also RiverWatch grant received
Nisqually River Council	100,000	WA Dept of Ecology	100,000	Match by other agencies	200,000	
Lower East Branch Pecatonica River Priority Watershed	5,015,105	Wisconsin Fund			6,366,934	Locals pay \$1,351,829
Puget Sound Water Quality Authority		State appropriations		Centennial Clean Water Fund	8,900,000	For 1993
Suwannee River Water Management District	2,593,900	Ad valorem taxes and state appropriation	10,777,600	Documentary stamp tax and Preservation 2000 fund for land acquisition	14,904,300	Fees, other small grants, transfers, interest and SWIM grant
Sweetwater Authority	9,100,000	Negotiating with upstream developers and owners to recover cost of project			9,100,000	Reflects cost of pollution control project only
Tualitan River Critical Basin Project	Staff/overhead	Oregon DEQ			14,300,000	Funds for sewerage agency from rate-payers (\$4.9 million); City of Portland (\$9.1 million); OR Dept of Forestry (\$34,600); OR Dept. of Agriculture (\$250,000)
Upper Delaware Scenic and Recreational River	300,000	Appropriation via National Park Service	25,000	Foundation grant; NYS hazmat grant	350,000	Donations, interest, special building grant
Watershed Committee of the Ozarks		Local govts and utility company members		US EPA; USGS		Can receive donations, foundation grants and other sources

**Special Grants.** These programs have received funds from several special sources. Many of the programs have received EPA funding from one or more of the following authorities: Section 319 stormwater management, Section 106 authorities, Section 205j, Section 604b, and Coastal Zone Management. These agencies at times have also received from the US Geological Survey, the Army Corps of Engineers, the Department of Agriculture (Forest Service, Agricultural Conservation and Stabilization Service, or Soil Conservation Service), and the National Park Service. Funding has ranged from \$15,000 to \$5 million.

The three programs operating as nonprofit organizations have received dues and donations, corporate and government grants, and foundation funding in order to carry out various aspects of their program, including pollution control.

**Conclusions.** The state programs that are working the best are those in what are typically thought of as environmentally progressive states. The programs in Vermont, Wisconsin, Washington, and Oregon are likely typical of what will be considered good nonpoint programs in the future. Two are funded predominantly by their legislatures and two by special purpose, voter-approved bonds. None of them are funded well enough to handle anything but rural nonpoint programs and the development and enactment of urban erosion control, urban housekeeping, and stormwater management ordinances. Wisconsin can also fund street-sweeping programs. As Table 2. shows, however, even small projects with only 50% of potential land operators actually participating, will have direct costs of up to \$5 million, exclusive of costs for storm sewers, CSO controls, and stormwater retention/detention systems. The questions of how to address urban stormwater retention/detention and combined sewer overflows remain unanswered.

### ***Assistance Provided by US EPA***

Many of the agencies have received funds or technical support from EPA. Typically, agencies will have used Section 319 funds in preparing stormwater management plans as part of their overall watershed approach. Others have received funds under Sections 106, 205j, 604b, Coastal Zone Management, National Estuary Program, and one special pilot program. Table 2 indicates which programs have received EPA funds in the past few years.

Agency personnel indicate several needs to make the nonpoint programs more successful:

- ***Funding for agency field personnel.*** Most BMP arrangements are cost-shared programs that are entered into on a voluntary basis with private landowners or operators. These people do not make personal financial commitments en masse, resulting in the need for individual site visits and negotiations which take time and money. Some voluntary programs have participation from only 15 percent of those eligible to participate, too small a number to make a serious dent in nonpoint pollution abatement.
- ***Funding for the government share of the installation costs of BMPs and other practices.*** Even a state like Wisconsin, with a specially funded program, only spends an average of \$4 million per year on nonpoint controls, and a substantial portion of that money is paid to local governments to manage implementation.



***Funding for the assessment work.*** The state process begins with a statewide assessment that identifies priority watersheds. Then for each priority watershed a detailed assessment is prepared, following which public education begins in earnest, contracts are negotiated, BMPs are installed and ordinances enacted, and implementation is monitored, recorded and assessed. Vermont has divided the state into seventeen watersheds, Wisconsin has done nearly sixty plans so far. They believe sufficient funding to do the analysis work is imperative.

***Conclusions.*** Not surprisingly, funding continues to be the issue on which the success of these programs depends. Rural land disturbance projects that require public permits such as silviculture, mining, trail-building, pipeline construction, utilities management, and roadway construction and maintenance likely can have more stringent nonpoint management standards built into their normal operations without additional specific funding. Agricultural BMPs have traditionally been cost-shared. Raising participation levels to 75 percent or higher of targeted operations will require major additional investment. Having legislatively established cost-share percentages and unit costs on BMP installations, as is done in Wisconsin, will help to clarify the level of investment.

Urban programs are more difficult. The enactment of comprehensive local ordinances to control soil erosion and to improve urban housekeeping practices likely can be accomplished without staggering costs. This may also extend to street-sweeping, controlling stormwater on site for new land uses and changes of land uses, and similar controlled cleanup and moderate stormwater management programs.

A phased implementation strategy may help to control financial outlays and stem the onset of new problem areas. An initial phase could:

- Stress the implementation of plans to avoid future hazards
- Require the installation of BMPs for new land uses and changes of land uses
- Require the passage of appropriate ordinances
- Implement lower cost urban practices
- Fund training and state staffing levels
- Introduce a build-up of investment in agricultural BMPs
- Require planning and implementation of BMPs for new public projects such as roads, river projects, conservation programs, and so on

A second phase could address more persistent problems:

- Initiate separation of sanitary and storm sewers on a priority basis
- Begin stormwater retention/detention projects on a priority basis
- Undertake the installation of BMPs in abandoned mine lands watersheds
- Begin retrofitting on a priority basis existing public project with BMPs and comprehensive plan changes

## Resource Management Techniques

The twenty-nine programs profiled for this review employ an array of over fifty practices, programs, and authorities to control nonpoint sources of pollution. What became clear over the course of the analysis is that project managers must have a balanced combination of these capabilities to be successful in controlling nonpoint sources. This means that (1) there must be an adequate and appropriate set of installable practices that actually reduce pollution; (2) the management programs must be sufficiently funded, staffed, trained, and empowered to create positive and continuous action; and (3) the legal authorities must be there to ensure implementation by all parties in and out of government.

### *Specific Management Techniques Employed*

The programs profiled use many different techniques for controlling nonpoint sources. The mixture depends on how the program was originally established, and what the primary issues are that it has addressed to date. This analysis divides them up into five groupings:

1. Permit and planning powers
2. Agricultural practices
3. Urban watershed practices
4. Land use practices
5. Education and other practices

**Permit and Planning Powers.** Permit and planning powers indicate what the basic powers of each organization are. This analysis examined six key capabilities, which are summarized in Table 3. They are:

1. Voluntary program—Sixteen of the programs are voluntary in whole or in part. For instance, in the Wisconsin program, counties, municipalities and landowners can choose whether or not to participate in the program. But the fact that the state has sixty plans in place or in progress attests to the fact that the system is working. The Watershed Committee of the Ozarks is relying on education, technical credibility and persuasion to convince people to protect the water supply watershed.
2. Review and comment responsibility for permit applications—Twenty-two programs have the ability to review and comment on permit applications. The programs that do not are those which do not create new managing or coordinating agencies.
3. Review and approval power over permit applications—Twelve programs have the ability to review and approve local permit applications. The Florida water management districts have permitting power over many water resource and land use related permits in their districts. The Cape Cod Commission is a regional planning commission granted approval powers by affected municipalities. This power generally distinguishes between state or federally authorized joint powers boards or compacts and more locally based programs.
4. Review and approval power over local plans and ordinances—The power to review and approve local plans and ordinances is generally restricted to special powers authorities. The priority watershed program in Wisconsin reviews and approves erosion control and stormwater management ordinances only. The Pinelands Commission is legally required

**Table 3.**  
**Watershed Management Programs**  
**Permit and Planning Powers Table**

Program	Voluntary Program	Review & Comment on Permits	Review & Approve Permits	Review & Approve Local Plans	Consistency Power In Planning & Permits	Review & Approve State Actions	Other Powers
<b>Multi-State Programs</b>							
Delaware River Basin Commission	No	Yes	Yes	No	Yes	Yes	DRBC prepares a comprehensive coordinated joint plan approved by all signatory parties
Interstate Commission on the Potomac River Basin	Yes	Yes	No	No	No	No	Biggest efforts by the Commission are the preparation of technical studies under contract to local, state and federal agencies
Ohio River Valley Water Sanitation Commission	No	Yes	Yes Sparingly	No	No	Yes Sparingly	ORSANCO prefers not to use its approval powers unless absolutely necessary
<b>State Programs</b>							
Arizona Active Management Areas	Yes	Yes	No	No	No	No	State Dept of Water Resources has permit approval power
Chesapeake Bay Critical Area Commission	No	Yes	Yes	Yes	Yes	Yes	
Nebraska Natural Resource Districts	Yes	Yes	Yes	No	No	No	
Wisconsin Nonpoint Source Water Pollution Abatement Program	Yes	No	No	Yes	No	No	
Vermont Nonpoint Source Management Program	Yes/No	Yes	Yes	Yes	Yes	Yes	Ties into state zoning powers and agriculture-oriented voluntary BMP programs
<b>Regional Programs</b>							
Cape Cod Commission	No	Yes	Yes	Yes	Yes	No	Strong focus on groundwater protection and recharge
NW Florida Water Management District	No	Yes	Yes	No	No	No	State maintains some permit powers
New Jersey Pinelands Commission	No	Yes	Yes	Yes	Yes	Yes	
Phoenix Active Management Area	No	Yes	No	No	No	No	Enforcement and permit approval through Dept of Water Resources
South Florida Water Management District	No	Yes	Yes	No	No	No	State maintains some permit powers

**Table 3. (Continued)**  
**Watershed Management Programs**  
**Permit and Planning Powers Table**

Program	Voluntary Program	Review & Comment on Permits	Review & Approve Permits	Review & Approve Local Plans	Consistency Power in Planning & Permits	Review & Approve State Actions	Other Powers
<b>River and Watershed Programs</b>							
Anacostia Watershed Restoration Committee	Yes	No	No	No	No	No	Plan depends on coordinated implementation by the members; technical support from federal & state agencies; though the agreement commits parties to consistent actions; probably is not binding
Barnegat Bay Watershed Plan	Yes	No	No	No	No	No	Plan calls for piecemeal implementation by relevant agencies
Black Earth Creek Priority Watershed	Yes	No	No	Yes/No	No	No	BMP program is voluntary; counties and municipalities agree in plan to enact erosion control ordinances
Grande Ronde Critical Basin Project	No	Yes	Yes	Yes	No	No	TMDL's assigned to point source dischargers; discharge plan approvals required
Guadalupe-Blanco River Authority	NA	Yes	No	No	No	No	State departments have permit power; Authority owns and operates structural systems
Menomonee River Priority Watershed	Yes	No	No	Yes/No	No	No	BMP program is voluntary; counties and municipalities agree in plan to enact erosion control ordinances
Middle Fork River Watershed Pilot Project	Yes	No	No	No	No	No	No local or state land use powers; program is structural and depends on participation of state and federal agencies
Mississippi Headwaters Board	No	Yes	Yes	Yes	Yes	Yes	Consistency provision built into enabling legislation
Nisqually River Council	Yes	Yes	No	No	No	No	Plan relies on voluntary coordinated implementation by its members; the basic powers are coordinative and cooperative
Lower East Branch Pecatonica River Priority Watershed	Yes	No	No	Yes/No	No	No	BMP program is voluntary; counties and municipalities agree in plan to enact erosion control ordinances
Puget Sound Water Quality Authority	Yes	Yes	No	No	Yes	No	State law calls for consistency, but no enforcement teeth; program relies on voluntary implementation by state, local agencies; the program has been successful
Suwannee River Water Management District	No	Yes	Yes	No	Yes	No	Some consistency is achieved through contractual agreements with state agencies; District uses its own permitting authority otherwise
Sweetwater Authority	Yes	Yes	No	No	No	No	The Authority is working to get upstream developers & property owners to voluntarily sign contracts to help finance downstream protection project
Tualitan River Critical Basin Project	No	Yes	No	Yes	No	No	Local plans prepared according to state legislative directives
Upper Delaware Scenic and Recreational River	Yes	Yes	No	No	Yes	No	Federal land acquisition provisions kick in if plans and permits are not consistent with plan; state and federal consistency in place
Watershed Committee of the Ozarks	Yes	Yes	No	No	No	No	Relies on cooperation

to ensure that local plans conform to the Pinelands Comprehensive Plan. The situation is likewise for the Chesapeake Bay Critical Area Commission. This is a strong capability if it can be had.

5. **Consistency power over planning and permits**—The consistency provision is one in which the watershed program's enabling legislation states that all other agencies within that unit of government will only take actions that are in furtherance of the goals and missions of the program. The Commission encourages towns to develop comprehensive plans that are consistent with its regional policy plan offering funding, planning and the ability to exact impact fees on development. In many circumstances, this provision stops problems before they occur. Multi-agency watershed programs that tie the program together with consistency agreements usually have the best management plans available. Eight of the programs in this analysis possess this provision. Within this study, the program with the most complicated planning environment for which consistency provisions exist is the Upper Delaware Council.

The National Wild and Scenic Rivers Act provides for consistent action by all federal agencies, including the responsible federal agency, the National Park Service. The River Management Plan, the basis for the Council, called on the Delaware River Basin Commission to adopt the parts of the plan relevant to its own mission as part of its comprehensive plan, which it did. The Governor of Pennsylvania signed an Executive Order bringing that state's actions into consistency, and a similar order is awaiting signature by the Governor of New York. Each affected municipality that becomes a member of the Council signs an agreement committing the municipality to consistent action. These enforceable obligations enable the Council to affect the direction of plans, permits, and programs managed by all potentially affected units of government.

6. **Review and approval power over state actions**—Only six programs have this power, prominent among them the Chesapeake Bay Critical Area Commission. This is a power generally reserved for state agencies and multi-state compacts. It provides a strong, enforceable power that guarantees implementation of the program.

**Agricultural Practices.** Fifteen of the programs have adopted the USDA Soil Conservation Service Technical Office Guide as the official planning handbook for installing agricultural BMPs. The programs have also adopted other special agricultural programs. These practices are summarized in Table 4:

1. **USDA SCS BMPs**—The SCS Technical Office Guide lists the following (list adapted from Wisconsin Priority Watershed Program) as acceptable best management practices for agricultural lands conservation and pollution control:

Contour Farming	Reduced Tillage
Contour Strip Farming	Critical Area Stabilization
Field Strip Cropping	Shoreline Buffers
Field Diversions and Terraces	Barnyard Runoff Management
Grassed Waterways	Animal Lot Relocation
Grade Stabilization Structures	Wetland Restoration
Agricultural Sediment Basins	Nutrient and Pesticide Management
Shoreline and Streambank Stabilization	Manure Storage Facilities
Roofs for Barnyard Runoff Management & Manure Storage Facilities	Livestock Exclusion from Woodlots

**Table 4.**  
**Watershed Management Programs**  
**Agricultural Management Practices Table**

Program	Follows SCS Technical Office Guide for Agricultural BMPs	Follows State Handbook on Agricultural BMPs	Other Techniques Used for Agricultural Pollution Control
<b>Multi-State Programs</b>			
Delaware River Basin Commission	NA	NA	
Interstate Commission on the Potomac River Basin	NA	NA	
Ohio River Valley Water Sanitation Commission	NA	NA	
<b>State Programs</b>			
Arizona Active Management Areas	Yes	No	Permits required for groundwater recharge and withdrawal areas
Chesapeake Bay Critical Area Commission	Yes	No	BMPs for soil, water, fertilizer, pesticides, crop residues, and animal husbandry
Nebraska Natural Resource Districts	Yes	Yes	Special program for the control of chemicals used in irrigation waters
Wisconsin Nonpoint Source Water Pollution Abatement Program	Yes	No	
Vermont Nonpoint Source Management Program	No	Yes	Agricultural Acceptable Management Practices, Acceptable Management Practices for Silviculture, Standards for Ground Water Protection
<b>Regional Programs</b>			
Cape Cod Commission	No	No	Performance standards for specific zones—fresh water recharge areas, marine water recharge areas, wellhead protection areas, impaired areas, water quality improvement areas, and potential public water supply areas
NW Florida Water Management District	No	Yes	
New Jersey Pinelands Commission	Yes	No	Erosion and runoff, animal waste, fertilizers and pesticide
Phoenix Active Management Area	Yes	No	Permits required for recharges and withdrawals of groundwater
South Florida Water Management District	Yes	Yes	Dairy Rule program (reduce phosphorus by controlling animal and high-nutrient waste); dairy buyout program

**Table 4. (Continued)**  
**Watershed Management Programs**  
**Agricultural Management Practices Table**

Program	Follows SCS Technical Office Guide for Agricultural BMPs	Follows State Handbook on Agricultural BMPs	Other Techniques Used for Agricultural Pollution Control
<b>River and Watershed Programs</b>			
Anacostia Watershed Restoration Committee	NA	NA	Virtually no agriculture in basin
Barnegat Bay Watershed Plan	Yes	No	Plan is not implemented yet
Black Earth Creek Priority Watershed	Yes	No	Budget based on 75% farm participation
Grande Ronde Critical Basin Project	Yes	No	Agricultural BMPs will be followups to Point Source Discharger TMDLs
Guadalupe-Blanco River Authority	No	No	
Menomonee River Priority Watershed	Yes	No	Budget based on 75% farm participation
Middle Fork River Watershed Pilot Project	No	No	
Mississippi Headwaters Board	Yes	No	Farm conservation plan that maintains vegetation on steep slopes, avoids bluff impact zones; vegetation management plan, prohibit new animal feedlots, BMPs for forestry practices, prohibit vegetation clearing within setback and bluff impact zones
Nisqually River Council	No	No	Minimal agricultural activity in the project area
Lower East Branch Pecatonica River Priority Watershed	Yes	No	Budget based on 75% farm participation
Puget Sound Water Quality Authority	Yes	No	Dairy waste management plan
Suwannee River Water Management District	No	Yes	
Sweetwater Authority	No	No	Serves an urban district
Tualitan River Critical Basin Project	Yes	No	Focus on fertilizer and animal waste controls
Upper Delaware Scenic and Recreational River	No	No	Prohibition on new animal feedlot and intensive livestock uses; limit existing feedlot and intensive uses to present size; less than 6 working farms in valley
Watershed Committee of the Ozarks	No	No	Encourages use of agricultural BMPs through Soil Conservation Service



2. **Special dairy practices**—The South Florida Water Management District follows the state dairy rule, a program to reduce phosphorus flows to Lake Okeechobee by controlling animal and high-nutrient waste. The District also has a dairy buyout program to move dairy operations out of the Lake Okeechobee-Everglades drainage area. The Puget Sound Water Quality Authority also employs a dairy waste management program for similar purposes.
3. **Other state agricultural BMPs**—Vermont, Nebraska and Florida have their own handbooks and guidelines for installing agricultural BMPs.
4. **Other practices**—The Chesapeake Bay Critical Area Commission requires the installation of BMPs for soil, water, fertilizer, pesticides, crop residues, and animal husbandry. Nebraska has a special chemigation program for controlling the flow of agricultural chemicals into irrigation waters. The Pinelands Commission adopted its own standards for the control of erosion, runoff, animal waste, fertilizers and pesticide. For the Grande Ronde Critical Basin Project, agricultural BMPs will be follow-ups, if necessary, to the first phase TMDL control program. The Watershed Committee of the Ozarks recommends adoption of SCS guidance on agricultural BMPs. The Upper Delaware plan prohibits new animal feedlot and intensive livestock uses; and limits existing feedlot and intensive uses to present sizes. The Tualatin River project has a voluntary program focused on reduced pollution flows from fertilizer and animal waste. The Mississippi Headwaters Board requires the adoption of farm conservation plans that maintain vegetation on steep slopes and avoids bluff impact zones. The plan requires adoption of a vegetation management plan, prohibits new feedlots, and prohibits vegetation clearing within setback and bluff impact zones.

**Urban Watershed Practices.** There are a collection of a dozen or more techniques that can be used to control nonpoint sources in urban watersheds. Since this analysis searched for programs operating as much as possible on a whole watershed basis, many urban programs worthy of review were filtered out of the review. However, the Wisconsin program, the Anacostia project, and the Puget Sound project offer reasonable insight into urban-oriented programs. Table 5 offers a summary of the watershed practices employed by the profiled programs. These practices include:

1. **Stabilization of critical areas**—Twelve of the programs provide for the stabilization of critical or sensitive areas within the urban zone. The river conservation programs avoid the use of rip-rap, gabions, and similar structures, preferring instead to employ more natural methods of stream bank and sensitive zone stabilization.
2. **Grade stabilization structures**—Ten programs provide for grade stabilization structures.
3. **Shore and bank stabilization**—Eleven programs use shore and stream bank stabilization. Again, river conservation programs avoid the use of rip-rap, gabions, and similar structures, preferring instead to employ more natural methods of stream bank and sensitive zone stabilization.
4. **Shoreline buffers**—Fourteen of the programs require the use of shoreline buffers. States with shoreland management programs—in this analysis, Vermont, Wisconsin, Minnesota, Florida, and Washington fall into this category—enforce this system rigorously.
5. **Restore wetlands**—Thirteen of the programs provide for wetland restoration projects as nonpoint source control systems.

Table 5.  
Watershed-Oriented Nonpoint Source Water Pollution Control Programs  
Urban Watershed Management Practices Table

Program	Stabilize Critical Areas	Grade Stabil. Structure	Shore & Bank Stabiliz.	Shoreline Buffers	Restore Wetlands	Structural Urban Practices	Street Sweep	Urban House- keeping Practices	Storm- water Ret. Detention	CSO Manage- ment	Other Practice Used
<b>Multi-State Programs</b>											
Delaware River Basin Commission	No	No	No	No	No	No	No	No	Yes	Yes	
Interstate Commission on the Potomac River Basin	No	No	No	No	No	No	No	No	No	No	
Ohio River Valley Water Sanitation Commission	No	No	No	No	No	No	No	No	No	No	
<b>State Programs</b>											
Arizona Active Management Areas	No	No	No	No	No	No	No	No	No	No	
Chesapeake Bay Critical Area Commission	No	No	No	Yes	Yes	Yes	Yes	Yes	No	No	
Nebraska Natural Resource Districts	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	
Wisconsin Nonpoint Source Water Pollution Abatement Program	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vermont Nonpoint Source Management Program	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<b>Regional Programs</b>											
Cape Cod Commission	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Groundwater emphasis
NW Florida Water Management District	Yes	No	Yes	Yes	Yes	No	No	No	Yes	Yes	
New Jersey Pinelands Commission	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	
Phoenix Active Management Area	No	No	No	No	No	No	No	No	No	No	Nonpoint not used yet
South Florida Water Management District	No	No	No	No	No	No	No	No	No	No	Rural-oriented program

Table 5. (Continued)  
 Watershed-Oriented Nonpoint Source Water Pollution Control Programs  
 Urban Watershed Management Practices Table

Program	Stabilize Critical Areas	Grade Stabil. Structure	Shore & Bank Stabiliz.	Shoreline Buffers	Restore Wetlands	Structural Urban Practices	Street Sweep	Urban House- keeping Practices	Storm- water Ret/ Detention	CSO Manage- ment	Other Practice Used
<b>River and Watershed Programs</b>											
Anacostia Watershed Restoration Committee	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Barnegat Bay Watershed Plan	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Training, plantings
Black Earth Creek Priority Watershed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Grande Ronde Critical Basin Project	No	No	No	No	No	No	No	No	No	No	Rural & point source orientation
Guadalupe-Blanco River Authority	No	No	No	No	No	No	No	No	No	No	Point source oriented
Menomonee River Priority Watershed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Middle Fork River Watershed Pilot Project	No	No	No	No	No	No	No	No	No	No	Rural program
Mississippi Headwaters Board	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Nisqually River Council	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	
Lower East Branch Pecatonica River Priority Watershed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Rural program
Puget Sound Water Quality Authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Suwannee River Water Management District	No	No	No	No	No	Yes	No	No	Yes	No	Rural and wetland oriented program
Sweetwater Authority	No	No	No	No	No	Yes	No	Yes	Yes	No	
Tualitan River Critical Basin Project	Yes	Yes	Yes	No	No	No	No	Yes	No	No	First phase targets TMDLs from point sources
Upper Delaware Scenic and Recreational River	Yes	Yes	Yes	Yes	NA	No	No	No	No	Yes	Natural stream bank stabilization preferred
Watershed Committee of the Ozarks	No	No	No	No	No	No	No	No	No	No	Education & advocacy

6. **Structural urban practices**—Fourteen programs provide for the use of structural urban practices.
7. **Street-sweeping**—Street-sweeping, a practice only recently classified to be a nonpoint source control mechanism, is provided for by ten programs. Wisconsin provides cost-sharing for the practice.
8. **Urban housekeeping practices**—A variety of techniques are known as urban housekeeping practices. Thirteen programs provide for such uses. The Portland, Oregon, City Council has banned the sale of phosphate detergents as part of the Tualatin River program. To limit pesticide, herbicide, and fertilizer runoff, the Pinelands Commission limits lawn sizes to 2,000 square feet, the remaining areas to be maintained in indigenous vegetation. The Cape Cod Commission prohibits the use of septic tank chemical cleaning systems.
9. **Stormwater retention/detention**—Stormwater retention/detention systems are provided for in sixteen of these programs. Wisconsin funds planning projects but not construction. The Sweetwater Authority's system to have polluted inflows bypass the water supply reservoir is a variation of stormwater management. The Mississippi Headwaters Board requires that stormwaters be held on site for natural and distributed recharge.
10. **Combined sewer overflow management**—Only twelve of these programs address the issue of combined sewer overflow, an indicator that most of these are rural oriented programs. The Wisconsin program pays for planning to resolve these problems, but it provides no construction funds. CSOs are a prohibited use on the Upper Delaware. Vermont has money allocated to resolving CSO problems in the City of Burlington.
11. **Other practices**—The Barnegat Bay plan emphasizes training of municipal and county personnel in nonpoint management methods and in the use of tree, grass and vegetative plantings as another method of nonpoint control.

**Land Use Planning Practices.** Land use management practices are an important part of management for many land and riverine conservation projects. In many instances, these practices are designed specifically to reduce erosion and water pollution from nonpoint sources such as home sites, roadways, timber harvesting and mining areas, as well as agriculture. There are a collection of a dozen or more techniques that can be used to control nonpoint sources in urban watersheds. The Chesapeake Bay Critical Area Commission, Upper Delaware Council, and Mississippi Headwaters Board use all of the techniques identified, and the Nisqually River Council and New Jersey Pinelands Commission use all but one. The key indicators of the most thorough programs for land use planning are requirements for larger minimum lot sizes and development controls on ridge lines. Table 6 presents a summary of the land use planning techniques employed by the profiled programs. These practices include:

- |  |   |
|--|---|
| <input type="checkbox"/> Limit development on steep slopes | <input type="checkbox"/> Require larger minimum lot sizes |
| <input type="checkbox"/> Limit size of impervious surface  | <input type="checkbox"/> Require shoreline buffers        |
| <input type="checkbox"/> Make use of cluster development   | <input type="checkbox"/> Limit development on ridge lines |
| <input type="checkbox"/> Limit intensive livestock uses    | <input type="checkbox"/> Septic system controls           |
| <input type="checkbox"/> Forestry practices controls       | <input type="checkbox"/> Erosion control ordinances       |
| <input type="checkbox"/> Road building management          | <input type="checkbox"/> Performance zoning techniques    |

Table 6.  
Watershed-Oriented Nonpoint Source Water Pollution Control Programs  
Land Use Planning Techniques Table

Program	Limit Dvlpmnt on Steep Slopes	Larger Minimum Lot Sizes	Limit Use of Imperv. Surfaces	Require Shoreline Buffers	Make Use of Cluster Dvlpmnt	Limit Dvlpmnt on Ridge Lines	Limit Intensive Livestock Uses	Septic System Controls	Forestry Practice Controls	Erosion Control Law	Other Practice Used
<b>Multi-State Programs</b>											
Delaware River Basin Commission	No	No	No	No	No	No	No	No	No	No	No local regulations
Interstate Commission on the Potomac River Basin	No	No	No	No	No	No	No	No	No	No	No local regulations
Ohio River Valley Water Sanitation Commission	No	No	No	No	No	No	No	No	No	No	No local regulations
<b>State Programs</b>											
Arizona Active Management Areas	No	No	No	No	No	No	No	No	No	No	
Chesapeake Bay Critical Area Commission	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Nebraska Natural Resource Districts	No	No	No	No	No	No	No	Yes	No	Yes	
Wisconsin Nonpoint Source Water Pollution Abatement Program	No	No	No	Yes	No	No	No	Yes	Yes	Yes	
Vermont Nonpoint Source Management Program	No	No	No	No	No	No	No	No	Yes	Yes	
<b>Regional Programs</b>											
Cape Cod Commission	No	No	No	No	No	No	No	Yes	No	No	Plan is performance standards-oriented
NW Florida Water Management District	No	No	No	No	No	No	No	Yes	Yes	Yes	
New Jersey Pinelands Commission	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Limit lawn size (and chemicals); limit waste oils, detergents, other chemicals
Phoenix Active Management Area	No	No	No	No	No	No	No	No	No	No	
South Florida Water Management District	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	

**Table 6. (Continued)**[illegible]



**Education and Other Practices.** Table 7. includes a potpourri of practices, programs, and authorities that nonpoint programs employ to carry out their missions. The three programs that make best use of this array of capabilities are the Chesapeake Bay Critical Area Program, the Vermont program, and the Pinelands Commission. The capabilities identified include:

1. **Forestry practices BMPs**—Eight of the programs include forestry practice BMPs in their arsenals. Florida and Vermont are two states with well-defined programs in this regard. The Headwaters Board and the Tualitan River program also have active programs.
2. **Groundwater protection BMPs**—The Cape Cod Commission is the only local entity working actively to protect groundwater. Five of the state and regional programs have groundwater protection programs, however, well illustrated by the Vermont program which addresses the issue through a groundwater protection BMP program.
3. **Wetlands creation**—Wetlands creation appears to be built into some programs, but it is difficult to tell how frequently the technique is used. The South Florida Water Management District is constructing a 3,600 acre wetland to trap phosphorus inflows to Lake Okeechobee, and the Middle Fork pilot project in West Virginia is using constructed wetlands to trap acid mine drainage and sediment runoff.
4. **Fishery enhancements**—Nearly all of the locally based programs have fishery enhancement as one of their nonpoint source goals, while the Florida Water Management Districts, Vermont, the Critical Area Commission, and the Pinelands Commission also maintain active programs in this regard. Fishery enhancements usually are oriented toward control of turbidity, dissolved oxygen, algal growth, and temperature.
5. **Wellhead protection and aquifer recharge zones**—Six programs use surface-oriented land use controls to protect zones around wellheads and aquifer recharge areas. The best defined local program is that for the Cape Cod Commission, which uses a performance based system for protecting these areas. The Critical Area Commission, Vermont, the Arizona program, and the Pinelands Commission also have programs governing these areas, although each approaches the issue differently.
7. **Controls on roadway construction and maintenance**—Only the Pinelands Commission and Mississippi Headwaters Board include specific provisions for limiting pollution from roadway construction and maintenance. The Pinelands Commission concentrates on reducing pollutants from herbicide and pesticide spraying along roadsides. The Headwaters Board controls those activities and directs the location of roadways away from sensitive zones. It also enforces standards on stormwater management techniques. None of the programs are yet requiring the use of innovative technology. For instance, new surfacing materials exist that many reduce the imperviousness of parking lots and driveways.
8. **Regulatory review and approval**—Sixteen of the programs have some level of review and approval of permits or ordinances. This is a fundamental requirement for the success of these programs.
9. **Provide technical assistance to private owners and units of government**—Nineteen of these programs advertise that they provide technical assistance to local governments or property owners and operators in their service areas. It is likely that all the programs do this to a certain degree.

10. **Public involvement or education programs**—Twenty-two programs have active public involvement or educational programs in place. A good example of an effective state-level program is Wisconsin. When local governments sign contracts with the state to implement priority watershed programs, they also agree to carry out the educational programs developed by the state in cooperation with the University of Wisconsin. The Watershed Committee of the Ozarks relies on its newsletter, an active media program, including the production of public service announcements, an outreach program, hands-on water quality improvement projects, and a wealth of publications to educate and involve the public.
11. **Other practices employed**—Several other techniques were employed by these programs that do not fit under any of the existing headings. These include:
  - ❑ **Land acquisition**—The Florida water management districts reviewed have plans to acquire over 100,000 acres for rivers protection over the next five years. The Pinelands Commission is well on the way to acquiring 100,000 acres in the Pinelands preservation zone.
  - ❑ **Agricultural easements**—Wisconsin includes the purchase of easements for shoreline buffers as one of its accepted practices.
  - ❑ **Mine acid drainage controls**—The only mining area reviewed here was the Middle Fork pilot project in West Virginia. However, this technique may become ubiquitous in the Appalachian states over the coming decades.
  - ❑ **Development credits for transfers of development rights**—The Pinelands Commission is the only organization presently using development credits to manage development.
  - ❑ **Limitations on gold dredging, ski trail erosion, and the control of nuisance aquatic plants**—Vermont has established policies or BMPs for these problems areas.
  - ❑ **Limitations on sand, gravel, and borrow pits**—The Pinelands Commission, Upper Delaware Council, and Mississippi Headwaters Board all have limitations requiring on-site control of stormwater runoff, filter systems, and similar programs for controlling pollution from sand and gravel operations and from borrow pit areas.

**Table 7.**  
**Watershed Management Programs**  
*Groundwater, Forestry Practices, and Other Techniques Table*

Program	Forestry Practices BMPs	Ground- water Protect. BMPs	Wetlands Creation	Fishery Enhance- ment	Wellhead Protect. Zones	Aquifer Recharge Zones	Manage Roadway Practices	Regulat. Review/- Approval	Technical Assistance	Grassroots Involvement or Education Program	Other Practice Used
<b>Multi-State Programs</b>											
Delaware River Basin Commission	No	No	No	No	No	No	No	Yes	Yes	Yes	
Interstate Commission on the Potomac River Basin	No	No	No	No	No	No	No	No	Yes	Yes	
Ohio River Valley Water Sanitation Commission	No	No	No	No	No	No	No	Yes	Yes	Yes	
<b>State Programs</b>											
Arizona Active Management Areas	No	No	No	No	No	No	No	No	No	No	
Chesapeake Bay Critical Area Commission	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Nebraska Natural Resource Districts	No	No	No	No	No	No	No	No	No	Yes	
Wisconsin Nonpoint Source Water Pollution Abatement Program	No	No	No	No	No	No	No	No	No	Yes	
Vermont Nonpoint Source Management Program	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
<b>Regional Programs</b>											
Cape Cod Commission	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	
NW Florida Water Management District	Yes	No	Yes	Yes	No	No	No	Yes	No	No	
New Jersey Pinelands Commission	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	
Phoenix Active Management Area	No	Yes	No	No	Yes	Yes	No	No	Yes	No	
South Florida Water Management District	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	

**Table 7. (Continued)**  
**Watershed Management Programs**  
*Groundwater, Forestry Practices, and Other Techniques Table*

Program	Forestry Practices BMPs	Ground- water Protect. BMPs	Wetlands Creation	Fishery Enhance- ment	Wellhead Protect. Zones	Aquifer Recharge Zones	Manage Roadway Practices	Regulat. Review/- Approval	Technical Assistance	Grassroots Involvement or Education Program	Other Practice Used
<b>River and Watershed Programs</b>											
Anacostia Watershed Restoration Committee	No	No	Yes	Yes	No	No	No	No	No	Yes	
Barnegat Bay Watershed Plan	No	No	Yes	Yes	No	No	Yes	Yes	No	Yes	
Black Earth Creek Priority Watershed	No	No	Yes	Yes	No	No	No	Yes	Yes	Yes	
Grande Ronde Critical Basin Project	No	No	No	No	No	No	No	Yes	Yes	Yes	Require TMDL's
Guadalupe-Blanco River Authority	No	No	No	No	No	No	No	No	No	No	
Menomonee River Priority Watershed	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	
Middle Fork River Watershed Pilot Project	No	No	Yes	Yes	No	No	No	No	Yes	No	Mine acid controls
Mississippi Headwaters Board	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	
Nisqually River Council	No	No	No	Yes	No	No	No	No	Yes	Yes	
Lower East Branch Pecos River Priority Watershed	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Yes	
Puget Sound Water Quality Authority	No	No	No	Yes	No	No	No	No	Yes	Yes	
Suwannee River Water Management District	Yes	No	Yes	Yes	No	No	No	Yes	No	Yes	
Sweetwater Authority	No	No	No	No	No	No	No	No	No	No	
Tualitan River Critical Basin Project	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	
Upper Delaware Scenic and Recreational River	No	No	No	Yes	No	No	Yes	No	Yes	Yes	
Watershed Committee of the Ozarks	No	No	No	Yes	No	No	No	No	Yes	Yes	

**Conclusions.** The programs with the most built-in capabilities are the Chesapeake Bay Critical Area Commission, the New Jersey Pinelands Commission, and the Mississippi Headwaters Board. Capabilities are built into their enabling legislation that ensures these programs will be implemented. The Critical Area Commission has review and approve powers over the relevant ordinances of nearly sixty units of local government and over projects permitted or developed by other state agencies. The Pinelands Commission has similar review and approve powers, it can manage the transfer of development rights, and it is coordinating the acquisition of 100,000 acres of land in sensitive zones. The Headwaters Board also has review and approve powers, and it has established land use standards that go further in building nonpoint management into the core of the conservation program than any other program reviewed here. These entities have special powers that enable them to take strong action, but such agencies are not likely to be duplicated elsewhere, precisely because they do have extraordinary powers.

The Vermont and Wisconsin programs possess powers that are not far behind the first three programs. They were not as successful in combining permit review and approve powers with land use powers. They are both strong in establishing agricultural BMPs, while Vermont appears to require BMPs for many more activities than are covered by the Wisconsin system.

The Upper Delaware Council is a valuable model for the ways in which it ties in the use of its members authorities to the overall success of the program. The Puget Sound Water Quality Authority pursues many different programs in implementing water quality controls. The Barnegat Bay plan includes an effective array of programs that could be emulated elsewhere. Its weakness is that there is no guarantee that it will be implemented.

Of special note is the groundwater plan for the Cape Cod Commission. It is exhaustive in the land use planning system it uses to protect groundwater. The combination of special use zones and performance standards for all developments appears to be a system worthy of emulation elsewhere in groundwater dependent areas.

### ***Mechanisms for Enforcement***

The programs profiled fall into two distinct groups with regard to enforcement powers. The first includes council-type programs that rely on the existing authorities of their members for implementation and enforcement. The second includes programs that are largely self-sufficient, have the authority to implement the program, and the legal and political clout necessary to ensure the plan is implemented. The effectiveness of these enforcement mechanisms can be increased through the use of educational programs.

The big issue is convincing private land operators to install BMPs. This appears to depend on two factors: the quality and training of assigned program personnel and their ability to negotiate with and assist the landowners and operators, and the level of subsidized support for the installation of BMPs.

**Conclusions.** Effective education programs can bolster enforcement as can hiring and training qualified personnel to staff state and federal programs. The ability of these people to work with affected populations will determine to a substantial degree how well government programs are implemented and how many land operators agree to participate in cost-shared BMP programs.

## ***Monitoring Systems***

The watershed programs use monitoring for three different purposes: (1) to acquire baseline data from which to make future management decisions; (2) to review the enforcement and effectiveness of management standards already in place; and (3) as an educational tool for involving the public in water quality issues.

These agencies use dozens of techniques to do the monitoring work, ranging from the use of water quality testing stations, to Riverwatch programs, aerial overflights, LANDSAT programs, and monitoring indicator species. Many of these locations are using GIS systems to plot data, and more of them are integrating their data layers with those of other agencies and universities, a method that provides a more comprehensive view of the situation.

**Conclusions.** There is little to be learned from reviewing the monitoring systems of these twenty-nine projects. The newest trend in monitoring is to build stronger connections between the science of monitoring and educational and public involvement activities, not to actually do the mission critical monitoring functions, but to establish for the public the importance of monitoring and the overall nonpoint program.

## ***Grassroots Involvement***

Nearly every program profiled has an ongoing educational or grassroots involvement program. The programs established specifically to undertake nonpoint programs for watersheds have public education and grassroots involvement as integral elements. See Table 7 for a summary of the programs with grassroots or education programs.

Wisconsin requires each local government partner to agree to implement the educational program development jointly with the University of Wisconsin Extension. The educational programs are multi-faceted, and they take advantage of the existing links of agricultural communities to government farm organizations. This is a strong system worth emulating elsewhere.

Direct grassroots involvement takes place in several ways—through participation in assessment or study groups, as governing board members, through citizen-based water quality monitoring programs, and through direct, hands-on restoration projects such as stream cleanups, tree planting, or natural streambank stabilization projects. Many programs also have developed special programs for schools. The exception is for groundwater management projects, which tend to be highly technical and poorly suited (so far) to grassroots participation.

Examples of projects with excellent citizen involvement in planning are the Upper Delaware Council, the Watershed Committee of the Ozarks, and the Wisconsin program. Members of the public serve on task forces or review teams responsible for preparing the analysis. The public becomes a shaper and reviewer of the overall plan.

The Watershed Committee of the Ozarks is a good example of how citizens become members of the governing board. The Committee's original board members were agency personnel from the participating municipality, county and utilities, with some additional at-large members. The agencies and utilities are now represented on the board by members they have selected



from the public, a move made to strengthen the program's ability to advocate change in agency programs.

Water quality monitoring programs abound. Models used include the Riverwatch system, the Save Our Streams program, and the Trout Unlimited program. All can be effective.

Nebraska Natural Resource Districts have planted over 50 million trees since they were organized in 1972, many of them by members of the public. The Anacostia Watershed Restoration Committee encourages citizens to participate in cleanups, park or open space improvement, and stream bank stabilization projects.

**Conclusions.** Twenty-two of the twenty-nine programs rely to some degree on voluntary participation for their success. Voluntary steps can be taken either by private landowners or by other units of government. Not surprisingly, each of these programs has developed a public involvement program or an open planning process to leverage more participation.

The public involvement programs reviewed here have four different modes of operation. The first, as represented by the Watershed Committee of the Ozarks, places private citizens on boards that make policy decisions regarding the direction of the program. The second, as represented by the Menomonee River Priority Watershed, uses a citizens advisory committee approach to gathering public comment about the study and planning process. The third and most common method is to use an educational program to inform the public about the watershed project. The fourth is typified by the Anacostia Watershed Restoration Committee which uses citizen participation in direct, hands-on stream restoration projects.

These techniques all have merit and should be built into all future programs as appropriate.

## Conclusions:

### The Elements of a Successful Partnership for Watershed Protection

The central question to be answered is what does this information add to the present debate over the format of watershed management. The traditional model has been for the states to be the partners with EPA in carrying out these projects, but the practice of watershed management is quite different from the construction of facilities and promulgation of regulations to control point sources of water pollution. The nature of this system is diverse and decentralized. Top-down management styles normally do not adapt well to these conditions. *These programs should be based upon a cooperative planning and management approach.*

Reforms involving cooperative planning among federal, state and local agencies are built into the Intermodal Surface Transportation Efficiency Act (ISTEA) enacted in 1991. The unique tradition of water in American politics has grown some traditions that are top-down in approach, and others that are bottom-up.

**Geographic Orientation.** One important issue is the need for being geographically oriented. The watershed approach addresses whole river systems or subsystems in a manner that is potentially effective. The one agency that has been active on a watershed basis for decades is the Soil Conservation Service (SCS), an agency within the Department of Agriculture. It operates local soil and water conservation districts throughout the country. The small watershed projects developed under its most commonly used authority, P. L. 566, average about 250 square miles in area. Other than SCS, there are only a few entities that actually operate on a watershed basis, and most of these were established by the states.

The states do have the power to create bodies that can address whole watersheds. Depending on state constitutions and traditions, these bodies can be imbued with simple coordinating and communication powers, or they can be given extraordinary powers, as has happened with the Chesapeake Bay Critical Area Commission, the New Jersey Pinelands Commission, and the Mississippi Headwaters Board in Minnesota.

In the case of urban areas, regional planning agencies and councils of government are not organized on a watershed basis. They will need cooperation from other parties to match the management and jurisdiction structure to the watershed. Given the states' differing support for council of government type operations, this may not be easy to do in legal terms. *As the priority watershed programs in Vermont, Wisconsin, Washington, and Oregon show, the states can readily create watershed partnerships with the credibility to accomplish the goals set out for them.*

**Identify Priority Watersheds.** The continental United States has approximately three million miles of stream flowing through about three million square miles of land area. Divided into the manageable units employed in Wisconsin, this could mean the need to create over 22,000 separate plans. Fortunately, not all streams are in a state of non-attainment, but there would still be a need for thousands of individual watershed plans. Since this large number cannot be digested all at once, *a logical process for identifying priority watersheds is essential for any future watershed management program.*

**Organizational Structures.** The legal and organizational structures through which the selected programs operate varies greatly. In general, they fall into five categories: (1) federal compacts for interstate organizations; (2) normal state programs operated by state agencies; (3) specially authorized state programs operated by semi-independent agencies or joint powers boards; (4) cooperative projects operating without a formal and centralized management structure; and (5) nonprofit organizations whose members are government agencies or other units of government.

Statewide watershed management is done most easily through ongoing state agencies operating within their normal assigned areas of responsibility. Wisconsin's Priority Watershed Program is a good example of an ongoing state program. However, special authority commissions and boards can be enabled with considerable authority as they manage water resources with limited management boundaries. The Cape Cod Commission in Massachusetts typifies this approach. Cooperative projects come into being through the execution of Memoranda of Understanding between participating agencies. The Anacostia Watershed Restoration Committee in Maryland and the District of Columbia is a fine example of a joint, cooperative effort of many agencies working to restore a watershed, without need of a separate centralized management bureaucracy.

The extraordinary powers bestowed on special authority programs make them the most effective in addressing single or regional watersheds. The programs with the most built-in capabilities are Maryland's Chesapeake Bay Critical Area Commission, the New Jersey Pinelands Commission, and the Mississippi Headwaters Board in Minnesota. *These entities have special powers that enable them to take strong action, but such agencies are not likely to be duplicated elsewhere, precisely because they do have extraordinary powers.*

Ongoing programs in states with aggressive environmental management agencies are the most effective in addressing all watersheds in a state. The Vermont and Wisconsin programs possess powers that are not far behind those of the special powers boards mentioned in the previous paragraph. They were not as successful in combining permit review and approve powers with land use powers. They are both strong in establishing agricultural Best Management Practices, (BMPs), while Vermont appears to require BMPs for many more activities than are covered by the Wisconsin system.

Of special note is the groundwater plan for the Cape Cod Commission. It is exhaustive in the land use planning system it uses to protect groundwater. *The combination of special use zones and performance standards for all developments appears to be a system worthy of emulation elsewhere in groundwater dependent areas.*

There are several programs that have similarities to regional councils or councils of government (COGs). The Upper Delaware Council, the Mississippi Headwaters Board, the Nisqually River Council, and the Cape Cod Commission operate much like COGs. Only the Cape Cod Commission covers the entire watershed. It is likely that few existing COGs or regional councils are organized on a watershed basis, making them potentially poor choices to lead nonpoint planning. *The better choice is to build more capabilities within the responsible state agencies and have them organize affected political subdivisions into watershed management groups through Memoranda of Understanding or special powers legislation.*

***Opportunities for Voluntary Participation.*** Most programs rely to some degree on voluntary participation for their success. Voluntary steps can be taken either by private landowners or by other units of government. Not surprisingly, each of these programs has developed a public involvement program or an open planning process to leverage more participation.

***Educational Programs and Grassroots Involvement.*** Effective education programs can bolster enforcement as can hiring and training qualified personnel to staff state and federal programs. Their ability to work with affected populations will determine to a substantial degree how well government programs are implemented and how many land operators agree to participate in cost-shared BMP programs.

The public involvement programs reviewed here have four different methods of involvement. The first places private citizens on boards that make policy decisions regarding the direction of the program. The second uses a citizens advisory committee approach to gathering public comment about the study and planning process. The third and most common method is to use an educational program to inform the public about the watershed project. The fourth uses citizen participation in direct, hands-on stream restoration projects. *Public involvement and educational techniques all have merit and should be built into all future programs as appropriate.*

***Monitoring Systems.*** Many of the programs profiled use geographic information systems (GIS) to track changing conditions and to guide decision-making. This tactic is bogged down in some states as they work to convert disparate GIS databases into compatible systems accessible to all agencies, universities, researchers and consultants, and the business community. Some programs used aerial fly-overs to check for recent land use changes, while others seek placement of the newest water quality gauging stations. Several of these programs use RiverWatch or Save Our Streams programs that make use of volunteers and school children to track some key water quality indicators.

***Funding.*** Funding continues to be the issue on which the success of these programs depends. Half the programs profiled depend on state legislative appropriations for base funding, while four others in two states receive funding from voter-approved bonds. Service revenues, property taxes, ad valorem taxes, member contributions (the interstate compacts receive money from their state members), and county or municipal appropriations account for the balance of primary funding sources. Only one project was funded primarily through direct congressional appropriation. Half the programs receive special EPA contract or grant funds either directly or indirectly through a state agency. Only one program, the Middle Fork mined lands stream restoration project in West Virginia, depended on EPA as its primary revenue source. *The significant dependence on state legislative funding underscores the relationship between watershed management programs and state sponsorship. Unless a new source of primary funding is provided, it seems reasonable to nurture the relationship between the states and watershed management.*

***Staffing and Training.*** The managers whom the reviewers interviewed generally agree that implementing watershed management programs is a time-consuming, labor-intensive process that requires a large amount of personal interaction between project managers, local governments, and those entities that would install BMPs on their land or property. *Having sufficient funding to put a sufficient number of state water quality personnel out in the field*

*will be important to the success of future programs. Providing them with sufficient training in negotiating these agreements, both with local governments and with property owners, will be the next step. Preparing them to manage cooperative planning processes is the third step.*

**Applying Land Use Controls.** Land use controls, street sweeping, urban housekeeping ordinances, and education programs appear to produce benefits, and they remain the cost-efficient choice for addressing some aspects of urban nonpoint problems. Watershed managers would do well to examine how land use powers have been integrated into state and federal river and land conservation plans. Good examples are the Mississippi Headwaters Board, the Pinelands Commission, and the Upper Delaware Scenic and Recreational River. Land management controls include limitations on the disturbance of ridge or bluff lines, steep slopes, and land immediately along streams, lakes or ponds; requirements for soil conservation practices, forest and vegetative cover; and limitations on polluting uses and uses which create impervious land cover.

Certain other land use controls conducive to ecosystem-oriented watershed protection are not as apparent. As yet, there is no strong link to the protection of riparian zones and habitat corridors. There is also little apparent connection between river protection plans and flood plain management.

## **Recommendations**

A phased implementation strategy may help to control financial outlays and stem the onset of new problem areas. An initial phase could:

- Stress the implementation of plans to avoid future hazards
- Require the installation of BMPs for new land uses and changes of land uses
- Require the passage of appropriate ordinances
- Implement lower cost urban practices
- Fund training and state staffing levels
- Introduce a build-up of investment in agricultural BMPs
- Require planning and implementation of BMPs for new public projects such as roads, river projects, conservation programs, and so on

A second phase could address more persistent problems:

- Initiate separation of sanitary and storm sewers on a priority basis
- Begin stormwater retention/detention projects on a priority basis
- Undertake the installation of BMPs in abandoned mine lands watersheds
- On a priority basis, begin retrofitting existing public projects with BMPs and comprehensive plan changes



**Appendix A.**

**Program Profiles**

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## **Notes on Research Methods**

During the course of this investigation, the researchers reviewed nearly seventy programs from across the country to determine if they met the characteristics of an integrated nonpoint source water quality management program. The programs were divided into four types: multi-state programs usually enabled through federal compacts; state level programs that provide guidance to regional or local programs; regional programs in which the states are divided into large units but not on a watershed basis; and individual river or watershed specific programs.

The following sections identify the programs selected and those not selected, along with a brief explanation describing why those not selected were passed over in favor of others.

### **Multi-State Programs—Selected**

The programs chosen for review are:

1. Delaware River Basin Commission—Delaware River
2. Interstate Commission for the Potomac River Basin—Potomac River
3. Ohio River Sanitation Commission—Ohio River

### **State Programs—Selected**

The programs chosen for review are:

1. Arizona Active Management Area Program
2. Chesapeake Bay Critical Area Commission—MD
3. Nebraska Natural Resource District Program
4. Wisconsin Nonpoint Source Pollution Abatement Program
5. Vermont Nonpoint Source Pollution Control Program

### **Regional Programs—Selected**

The programs chosen for review are:

1. Cape Cod Commission—MA
2. New Jersey Pinelands Commission—NJ
3. Northwest Florida Water Management District—FL
4. Phoenix Active Management Area—AZ

**5. South Florida Water Management District—FL****River or Watershed Programs—Selected**

The programs chosen for review are:

1. Anacostia River—MD and DC
2. Barnegat Bay Estuary Program—NJ
3. Black Earth Creek Priority Watershed Project—WI
4. Grande Ronde Critical Basin Project—OR
5. Guadalupe-Blanco River Authority—TX
6. Menomonee River Priority Watershed Project—WI
7. Middle Fork River—WV
8. Mississippi Headwaters Board—MN—Upper Mississippi River (Above St. Paul)
9. Nisqually River Council—WA
10. Lower East Branch Pecatonica River Priority Watershed Project—WI
11. Puget Sound Water Quality Authority—WA
12. Suwannee River Water Management District—FL
13. Sweetwater Authority—CA
14. Tualatin River Critical Basin Project—OR
15. Upper Delaware Scenic and Recreational River—NY—PA
16. Watershed Committee of the Ozarks—MO

## **Part I. Profiles of Multi-State Programs**

- H Delaware River Basin Commission— Delaware River**
- H Interstate Commission for the Potomac River Basin— Potomac River**
- H Ohio River Sanitation Commission— Ohio River**

**Delaware River Basin Commission****Agency**

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**Agency:**

Delaware River Basin Commission

**Telephone:**

609-883-9500

**Address:**

P.O. Box 7360

**Fax Telephone:****City-ST-Zip:**

West Trenton, New Jersey 08628

**Contact Person:**Dick Albert, x 256

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**Notes:**

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**Year and Method of Establishment**

The Delaware River Basin Commission (DRBC) was established in 1961 by an interstate compact. The states involved in this compact are Pennsylvania, Delaware, New Jersey, New York, and the federal government through the Department of the Interior. The Commission was born out of litigation between New Jersey and New York over use of headwater flows to the Delaware. The City of New York proposed to divert most of the flow for use as water supply, while New Jersey and other downstream uses demanded adequate flows to meet many domestic, environmental, and industrial uses. The US Supreme Court finally resolved the controversy, requiring an average daily minimum flow to be maintained at the northernmost gauge in New Jersey and suggesting that management of water resources be coordinated among all the affected states and the federal government, since the Delaware is classified as interstate waters. The resulting compact established the DRBC in 1961.

**Mission Statement/Strategic Focus**

The Commission develops plans, policies, and projects relating to the water resources of the basin. It designs and promotes uniform policies for water conservation, control, use and management in the basin. It also seeks to promote the development and financing of projects relating to the conservation of water and water quality in the basin.



## **Geographic Scale**

The basin covers 12,755 square miles and extends from the mouth of the Delaware Bay to the headwaters above Hancock, New York.

## **Mechanism for Intergovernmental Coordination**

The Delaware River Basin Commission is responsible for managing the water resources of the basin. The Commission includes the Governors of each of the four states and a presidential appointee, traditionally the Secretary of the Interior. Other governmental agencies that play an active role in the management effort of the basin include: the Delaware Department of Natural Resources and Environmental Control, the New Jersey Department of Environmental Protection, the New York Department of Environmental Conservation, the Pennsylvania Department of Environmental Resources, the Pennsylvania Fish Commission, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the National Park Service, the U.S. Army Corps of Engineers, the U.S. Geological Survey, the New York City Department of Environmental Protection, and the Philadelphia Water Department.

## **Sources of Funding and Budget Information**

Sources of funding include the federal government, Pennsylvania Department of Environmental Resources, other signatory states, and corporate grants. The budget amounts to \$2.5-\$3 million per year. Contributors include the States of Delaware (\$253,500), New York (\$269,600), New Jersey (\$554,000), and Pennsylvania (\$633,800); the federal government (\$427,750), federal water pollution control grant (\$240,000), project review fees (\$114,430), interest (\$116,000), and fines (\$27,500).

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## **Management**

### **Organizational Management**

From Article 3, Section 3.6 of the Compact Agreement: "The Commission may plan, improve, operate, own any and all projects, facilities, properties, activities and services determined by the commission to be necessary for the purposes of the commission; establish standards of projects in the basin which affect water resources; conduct and sponsor research on water resources; compile and coordinate systematic stream stage and ground water level forecasting data; conduct special ground water investigations tests; prepare, publish, and disseminate information and reports dealing with the water quality of the basin; negotiate for loans, grants, services, or any other method of aid that would serve to assist the Commission with desired goals; and to exercise the laws and powers as delegated by the compact agreement."

## **Management Techniques**

The Commission has many of the powers that a State would have for managing water resources and water quality. In particular, it issues permits for point source dischargers in the basin, sets water quality standards against which permit applications are tested, and increasingly is involved in setting standards for nonpoint source controls.

## **Enforcement Mechanisms**

The Commission has the power to issue administrative orders to support its permitting authority and to seek redress in any court of competent jurisdiction. The Commission collected \$27,500 in fines in FY 1991.

## **Monitoring System**

The Commission maintains several monitoring programs for water quality. In the Delaware Estuary, it checks 20 monitoring points 18 times per year. This work is conducted in cooperation with New Jersey, Delaware and Pennsylvania. From May through December, the DRBC monitor several points in cooperation with the National Park Service on the main stem and tributaries within and above the Upper Delaware Scenic and Recreational River and the concurrently managed Middle Delaware Scenic and Recreational River and the Delaware Water Gap National Recreation Area.

## **Representative Projects**

Some projects of the basin are Scenic Rivers Protection, the Scenic Rivers Monitoring Program, Toxics Management, Flood Stage Mapping, and Fish Ladder Improvement. Water quality studies were also begun to measure the levels of bacterial concentrations, toxics, thermal stress, sediment oxygen demand, chlorination, heavy metals, pesticides, phenols, PCBs, and the impact of combined sewer overflows. Under contract with the Army Corps of Engineers, the DRBC undertook a project of flood stage mapping for the reach of the Delaware River between River Mile 139.5 and 148.

The Commission recently upgraded water quality standards in the watersheds of the Upper and Middle Delaware National Wild and Scenic Rivers to meet the existing water quality levels in the river. On the Upper Delaware, for instance, the major indicators were raised 30 to 70 percent. These segments, and the tributaries within the boundaries of these nationally significant areas, are now classified as Outstanding Basin Waters. The primary criterion for allowable discharge into these watersheds is "no measurable discharge."

## **Grassroots Involvement**

The Commission maintains several advisory committees for water conservation, water resources management, and several special issues. The Commission undertook an extensive public involvement and comment program in its recent effort to upgrade water quality standards on the Upper and Middle segments of the river.

## **Assistance Provided by US EPA; Assessment of Value of the Assistance**

The Commission has received a \$525,000 grant from the U.S. Environmental Protection Agency to study and develop control strategies for combined sewer overflows in the Delaware Estuary.

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## **Sources**

### **Key Enabling and Governance Documents**

#### **Delaware River Basin Compact**

The DRBC requires the Commission to adopt a Water Resources Program each year based upon its Comprehensive Plan for the use and development of the basin's water resources.

The Commission adopted regulations during 1991 that govern the transfer of water and wastewater to and from the Delaware River Basin. The Commission will seek to discourage the exportation of water from the Delaware Basin or importation of wastewater. All projects involving a significant transfer of water must be submitted to the Commission.

### **Watershed Management Documents**

Comprehensive Plan, Water Code of the Delaware River Basin: policies and regulations, Rules of Practice and Procedure, Water Quality Regulations Document

## Interstate Commission for the Potomac River Basin

### Agency

Agency:  
Interstate Commission for the  
Potomac River Basin

Telephone:  
301-984-1908

Address:  
Suite 300  
6110 Executive Blvd.

Fax Telephone:  
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City-ST-Zip:  
Rockville, MD 20852-3903

Contact Person:  
Beverly Bandler

Notes:

### Year and Method of Establishment

Established as an interstate compact by an Act of Congress in 1940. Members of the Commission include the five signatories (Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia) plus the federal government.

### Mission Statement/Strategic Focus

The ICPRB mission includes interstate and basin-wide coordination; stimulation of federal and state action; basin-wide water quality monitoring evaluation, and other water related studies; liaison with citizen and government groups; dissemination of information about the Potomac Basin; and provision of technical support to compact members.

### Geographic Scale

The basin includes 14,670 square miles in four states (Maryland, Virginia, West Virginia, and the District of Columbia). The basin lies in five geological provinces: Appalachian Plateau, Ridge and Valley, Blue Ridge, Piedmont Plateau, and Coastal Plain. The major tributaries to the basin are the Shenandoah, South Branch, Monocacy, Savage, Cacapon, Anacostia, and Occuquan Rivers; Antietam and Conococheague Creeks.

**Mechanism for Intergovernmental Coordination**

Commissioners appointed by states (and the federal government), meet on a regular basis.

**Sources of Funding and Budget Information**

The ICPRB is supported by contributions from the signatory states, the District of Columbia, and the federal government. The Commission also receives an annual interstate agency grant under the Clean Water Act from the U.S. Environmental Protection Agency in partial support of water quality program activities. The budget was \$1,903,214.00 available in 1992.

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**Management****Type of Authority**

Non-regulatory

**Management Techniques**

Encourage cooperation and coordination, plus public involvement.

**Enforcement Mechanisms**

Non-regulatory

**Monitoring System**

The ICPRB conceived the Baseline Water Quality Monitoring Network (BWQMN). This network is composed of 72 stations strategically located to provide information for basin-wide examination, 32 of which are part of the nationwide EPA Core sampling network.

**Representative Projects**

Anacostia Watershed Restoration Agreement of 1987 signed by the District of Columbia, the State of Maryland, and its affected counties, Montgomery and Prince George's. The goals for this agreement are:

- Achievement of improved water quality and the protection of aquatic life, habitat, and other ecological perspectives.

- Basin-wide management of erosion, sediment, and other sources of pollution; maintenance of the tidal portion of the Anacostia as navigable for commercial and recreational uses.
- Expansion of activities for public recreational use.
- The enhancement of public interest and public participation in restoration activities.

Participating agencies include the Metropolitan Council of Governments, the Maryland Departments of the Environment and Natural Resources, the D.C. Departments of Consumer Affairs and Public Works, Maryland-National Capital Parks and Planning Commission, Montgomery County Department of Environmental Protection, and the Prince George's County Health Department and Department of Environmental Resources, The U.S. Army Corps of Engineers and the National Park Service.

Washington area jurisdictions (working with the Metropolitan Washington COG Water Resources Planning Board), state regulatory agencies, and Regional III of US EPA have joined forces in efforts to improve the Potomac's water quality. Several studies are complete, including an alternative disinfection study, feasibility study, sludge/solid waste co-disposal study (all for the Blue Plains wastewater treatment facility), D.C. combined sewer overflow study, estuary modeling, regional Potomac monitoring, Virginia Embayment Studies, and EPA Chesapeake Bay program studies. ICPRB has two specific tasks: 1) public education and participation and 2) living resources enhancement.

The ICPRB periodically disseminates water quality assessments of the Potomac's water and related land resources.

### **Grassroots Involvement**

There is a large degree of public participation in the ICPRB. The ICPRB Anacostia Public Education and Participation Program has reached over 50,000 people. The three main elements to this program are its newsletter *In the Anacostia Watershed* (12,000 circulation), a coordinator covering the sub-basins, and other educational products and activities. As part of the Commission's information and education activities, the agency publishes a widely read newsletter entitled the *Potomac Basin Reporter* (18,000 circulation). The ICPRB does encourage citizen involvement in Potomac issues. The Commission also publishes technical and citizen-oriented reports and papers concerning the basin and encourages action on important regional issues.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

106 grant, very helpful.

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## **Sources**

### **Key Enabling and Governance Documents**

Potomac Valley Conservancy District Compact

### **Watershed Management Documents**

Anacostia Watershed Restoration Agreement of 1987



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**Ohio River Valley Water Sanitation Commission**

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**Agency**

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**Agency:**

Ohio River Valley Water Sanitation  
Commission (ORSANCO)

**Telephone:**

513-421-1151

**Address:**

49 E. Fourth Street

**Fax Telephone:****City-ST-Zip:**

Cincinnati, Ohio 45202

**Contact Person:**

Alan Vicory

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**Notes:**

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**Year and Method of Establishment**

Established June 30, 1948 by an interstate compact agreement.

**Mission Statement/Strategic Focus**

The Commission shall conduct a survey of the territory included within the District, study the pollution control problems of the District, and make a comprehensive report for the prevention or reduction of stream pollution. The Commission is to recommend to the Governors of the signatory states uniform legislation dealing with the pollution of rivers, streams, and other water resources of the District. The Commission is also established to consult with and advise the various states, corporations, agencies, or persons on issues dealing with water resources. (Stated in Article VIII of the Ohio River Valley Water Sanitation Compact, the original mission).

**Geographic Scale**

The range of the agency spans eight states with a total drainage basin of 203,000 square miles.

**Mechanism for Intergovernmental Coordination**

The agency is directed by a commission of 27 members, three representatives from each signatory state and three from the federal government.

## **Sources of Funding**

Funded (partially) by the federal government and the U.S. Environmental Protection Agency. It is also supported proportionally by the eight member states, taking into account population and land area in the drainage basin.

## **Budget Information**

Backing for each state: Illinois \$40,595, Indiana \$151,415, Kentucky \$173,985, New York \$8,445, Ohio \$205,810, Pennsylvania \$113,175, Virginia \$29,310, W. Virginia \$89,140. EPA 106 grant \$379,825.

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## **Management**

### **Management Structure**

The structure is classified into five general categories: Water Quality Monitoring, Wastewater Discharge Standard Setting and Enforcement, Water Quality Assessment, Toxic Substances Control, and Spill Control.

### **Degree of Authority**

Set pollution control statistics for Ohio River, try to let state handle problem.

### **Management Techniques**

Compact adopted by Congress to follow, work with state agencies - top people from their Board of Directors.

### **Enforcement Mechanisms**

The Commission does have regulatory authority that it does not use unless necessary. ORSANCO's primary task is to continuously monitor water quality in the river. It will notify the proper authorities, state tries to correct situations, go in only if state needs help.

### **Monitoring System**

Established an automated monitoring system which provides continuous measurements of temperature, pH, and dissolved oxygen levels at strategic points on the Ohio River and its tributaries. Monthly samples are taken at 36 locations in the basin and are analyzed for 22 parameters. ORSANCO also monitors the river system

through the use of electro-fishing programs, monitoring wells, and the tracking of certain discharges for the compliance of the Pollution Control Standards.

### **Representative Projects**

Volunteer monitoring project Kentucky, Ohio, Indiana (began in 1992). Sampling programs, organics detection system (at 15 places on river).

### **Grassroots Involvement**

ORSANCO implemented the "Ohio River Sweep" program in conjunction with the Ashland Oil Company. This program was designed to serve as a campaign for public awareness and participation to address the problem of litter along the Ohio River shoreline. In 1992, the program drew over 17,000 volunteers from six states. They gathered 13,000 tons of trash and debris.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

ORSANCO and the EPA operated a water quality testing station where visitors could help perform simple water quality experiments.

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## **Sources**

### **Key Enabling and Governance Documents**

The Ohio River Valley Water Sanitation Compact. June 30, 1948. Agreement signed between the states.

### **Watershed Management Documents**

The ORSANCO Outlook, quarterly newsletter.

Annual Report, Ohio River Valley Water Sanitation Commission.

The Ohio River Valley Water Sanitation Commission and Its Activities, presented at the International Conference on Environmental Pollution, Lisbon, Portugal. April 1991.

## **Part II. Profiles of State Programs**

- H Arizona Active Management Area Program**
- H Nebraska Natural Resource District Program**
- H Wisconsin Nonpoint Source Pollution Abatement Program**
- H Vermont Nonpoint Source Water Pollution Control Program**

## Arizona Department of Water Resources

### Agency

Agency:  
Arizona Department of Water  
Resources

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(602) 542-1550

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15 South 15th Avenue

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Contact Person:  
Mark Frank, Dennis Sundie

### Notes:

This program is marginally relevant to this research. However, focusing as it does on critical groundwater management areas, the coordinating strategies between the state agencies with regard to the protection of groundwater is useful to understand.

### Year and Method of Establishment

Arizona's Groundwater Code was enacted in 1980 to address the groundwater overdraft problem of the state.

### Mission Statement/Strategic Focus

The primary objectives of this plan are: to control the allocation of groundwater in certain areas of the state to remedy the problems of severe over-drafting, and to establish regulatory measures by which conservation goals can be accomplished. The primary goals of the Active Management Areas are to achieve maximum safe yield by the year 2025.

### Geographic Scale

The Groundwater Code established four Active Management Areas within the state where the regulation of groundwater is the most severe. These areas are Phoenix, Tucson, Pinal, and Prescott. The Code also established two Irrigation Non-expansion Areas in Douglas and Joseph City. A third area was added in 1982 in Harquahala.

The Pinal AMA covers approximately 4,000 square miles. This area includes five groundwater sub-basins: Maricopa-Stanfield, Eloy, Vekol Valley, Santa Rosa Valley, and Aguirre.

The Phoenix AMA covers 5,646 square miles. This area is divided into seven sub-basins: East Salt River Valley, West Salt River Valley, Hassayampa, Rainbow Valley, Fountain Hills, Lake Pleasant, and Carefree. The Tucson AMA covers 4,600 square miles and includes both the Upper Santa Cruz and Avra Valley sub-basins. The Prescott AMA cover 485 square miles in central Yavapai County. This area is comprised of Little Chino and the Upper Aqua Fria groundwater sub-basins.

### **Mechanism for Intergovernmental Coordination**

River Basin Coordinating Commission - meet quarterly - North Arizona Council of Governments, Department of Water Resources, USDA Forest Service, Soil Conservation Service. For the purposes of meeting water quality and groundwater quality standards, the Department of Water Resources has entered into a Memorandum of Understanding with the state Department of Environmental Quality to assure the coordination of responsibilities in the Active Management Areas.

### **Sources of Funding and Budget Information**

Funding is from the Department of Agriculture, about \$750,000-\$1 million per 3 years.

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## **Management**

### **Management Structure**

There are five management periods established within the Groundwater Code. The first four of these time periods run for ten years each beginning in 1980, with the remaining fifth period lasting five years. A separate management plan is to be adopted by each of the AMAs. The composition of the management plan is primarily the conservation requirements of persons whom must comply to the rules of groundwater allocation.

The state Environmental Quality Act, which established the Department of Environmental Quality, provides for coordinated enforcement of the federal Clean Water Act, the Safe Drinking Water Act, the Resource Conservation and Recovery Act, and other relevant laws. The Departments of Water Resources and Environmental Quality are empowered to carry out groundwater quality investigations and remediation.

### **Degree of Authority**

The requirement of the management plan are directly enforceable by the Director of Water Resources. Likewise, the Department of Environmental Quality has full permitting authority in the areas of groundwater quality protection.

## **Management Techniques**

The program of most relevance to this research is the Aquifer Protection Permit program. It provides for the protection of aquifers, including the use of Best Management Practices for agricultural uses.

## **Enforcement Mechanisms**

If an annual report suggests that a particular user is in noncompliance with the requirements they are supposed to be meeting, then the Department may audit the records of the person for whom the report was filed. Audits may also be undertaken even if no evidence or suggestion of noncompliance is witnessed. The Department may inspect withdrawal locations to ascertain the compliance of requirements and may obtain search warrants should these measures be necessary. If the Director holds reason to believe a person is in violation of requirements, then he possesses the ability to begin a process of judicial review if the individual can prove their compliance at a hearing. The Director may recommend imposition of a court for a civil penalty of up to ten thousand dollars per day or seek injunctive relief. The Groundwater Code allows for criminal sanctions at the misdemeanor level for those who knowingly violate requirements. No criminal prosecution has been brought to date under the Groundwater Code.

## **Monitoring System**

The monitoring requirements for entities with distribution systems are located in section 4-104 of the Second Management Plans. The goal is to achieve the maximum safest water supply by the year 2025.

## **Representative Projects**

Major programs covered in the Second Management Plans are: agriculture conservation requirements (irrigation water duties, maximum annual groundwater allotments, and operating flexibility accounts, irrigation distribution systems), municipal conservation program, total gallons per day program, alternative conservation program (includes groundwater use limitation requirements, residential GPCD program, nonresidential requirements, small municipal providers, institutional providers, untreated water providers), individual use requirements, municipal distribution systems, monitoring and reporting requirements, industrial conservation program, groundwater quality assessment and management program, and the augmentation and reuse program.

**Grassroots Involvement**

The Department of Water Resources actively encourages public participation and comment. There are events dealing with public education that are sponsored by the Department of Natural Resources.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

None.

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**Sources****Key Enabling and Governance Documents**

Arizona Groundwater Code, Area Management Plan

**Watershed Management Documents**

Producing one - available in July, Arizona Water Resources Study



**Chesapeake Bay Critical Area Commission, MD****Agency****Agency:**

Chesapeake Bay Critical Area  
Commission

**Telephone:**

(410) 974-2426

**Address:**

45 Calvert Street, 2nd Floor

**Fax Telephone:**

(410) 974-5338

**City-ST-Zip:**

Annapolis, MD 21401

**Contact Person:**

Sarah J. Taylor, Executive Director

**Notes:****Year and Method of Establishment**

The Chesapeake Bay Critical Area Commission was created by act of the Maryland General Assembly in 1984. The legislation to create the Commission was one of ten pieces of legislation regarding restoration of the Chesapeake Bay that was enacted by the Maryland General Assembly that year.

**Mission Statement/Strategic Focus**

The Commission's two purposes are described in the enabling legislation:

1. "Establish a Resource Protection Program for the Chesapeake Bay and its tributaries by fostering more sensitive development activity for certain shoreline areas so as to minimize damage to water quality and natural habitats; and "
2. "Implement the Resource Protection Program on a cooperative basis between the State and affected local governments, with local governments establishing and implementing their programs in a consistent and uniform manner subject to State criteria and oversight."

The operating goals are to:

1. Manage adverse impacts on water quality that result from pollutants discharged from structures or conveyances that have runoff from surrounding land
2. Conserve fish, wildlife, and plant habitat
3. Establish land use policies for development in the Chesapeake Bay critical area that accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in that area can create adverse impacts.

## **Geographic Scale**

The critical area is defined in the legislation as the Maryland waters of the Chesapeake Bay, the lands under those waters, and an area 1,000 feet back from the tidal waters of the Bay. The regulations govern the land use and development activities within that boundary of sixteen counties and thirty-seven municipalities.

## **Mechanism for Intergovernmental Coordination**

The General Assembly defined a system of intergovernmental coordination for the Critical Area Commission that is quite different from that negotiated in most states. It defines a sharply hierarchical program in which the Commission has the authority to review and approve local plans, ordinances and significant development proposals; and state projects within the critical area. The legislation urges local jurisdictions to enter into cooperative agreements with relevant state and federal agencies for review of projects, technical support, and advisory functions. The Commission's role as lead agency for the Coastal Zone Program provides federal consistency as well.

## **Sources of Funding and Budget Information**

The Critical Area Commission is funded via appropriations from the state legislature and by contracts via its status as the state participant in the federal Coastal Zone Management Program. Appropriations amount to about \$1.1 million annually. CZM funds, all of which are allocated for planning use by the participating local governments, amounts to about \$800,000 annually.

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# **Management**

## **Organizational Structure**

The Commission is supported by a 25-member Board, a full-time Chairman, an Executive Director, and executive staff. The Board is filled according to a formula defined in the legislation. Each of the seven counties names one member to the Commission. The Chairman is named by and serves at the pleasure of the Governor, while the Executive Director is hired by the Chairman. The Commission is an independent state agency.

## **Types of Authority**

The Commission's authority comes from the enabling legislation and the Criteria for management. The Commission was authorized to prepare the criteria and recommend a system to the legislature. The General Assembly voted upon and approved the

criteria as a group by previous agreement, so as not to bog the system down in special interest amendments.

## **Management Techniques**

The management Criteria approved by the General Assembly provide for a wide range of beneficial environmental management techniques. Three objectives that apply throughout the critical are:

1. Reinforce and expand state programs for sediment control and stormwater management. If standards are maintained, these programs are designated to local jurisdictions for long term management.
2. Conserve or enhance the forest resources within the critical area for water quality benefits. This is done by requiring watercourses, shorelines, and nontidal wetlands to be buffered by strips of natural plant communities.
3. Require that soil conservation and water quality management plans be implemented on all farms. Techniques to be used include the application or installation of best management practices for the following: soil, water, fertilizer, pesticides, crop residues, and animal husbandry.

Within intensely developed area, the following practices are required to correct existing water quality problems from nonpoint sources:

- Establish urban forestry programs and through landscape improvements.
- Reduce the amounts of impervious surfaces
- Redevelopment projects are required to incrementally improve the quality of surface runoff.

In limited developed areas:

- Minimize surface areas disturbed by new development
- Limit the impervious area to 15 percent of the site
- Reduce road standards if safety is unaffected
- Prohibit development on steep slopes
- Limit forest clearing
- Require replanting of all cleared forests

In resource conservation areas:

- Maintain or increase the acreage of forest cover
- Require all farms to adopt a soil conservation and water quality management plan
- Low density development allowed in resource conservation areas must adhere to the standards prescribed in limited development areas.

**Enforcement Mechanisms**

The Chairman of the Commission is given legal standing to pursue violators or to appeal administrative decisions through all means of legal recourse. The Commission is vested with consistency powers to ensure that the program is fully implemented.

**Monitoring System**

The Commission reports that its wide-ranging management area makes monitoring difficult, given the number of other Bay-oriented programs. A University of Maryland study projects a positive long term effect on the Bay from the Critical Area Program.

**How Long Has the Plan of Management Been in Force?**

The Commission was instituted by the General Assembly in 1984.

**Representative Projects**

Commission projects are actually project reviews or ordinance reviews submitted for approval by local jurisdictions or other state agencies.

**Grassroots Involvement**

This is not a grassroots-oriented program.

**Program Benefits Identified to Date**

No clear measurements of benefits is in place.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

Nearly half of the Commission's funding comes from the Coastal Zone Management Program for use in planning functions by local jurisdictions.

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**Sources****Key Enabling and Governance Documents**

Chesapeake Bay Critical Area Commission: Title 14 Independent Agencies, Natural Resources Article Section 8-1801-1816, as amended.

Chesapeake Bay Critical Area Commission: Final Regulations, Subtitle 15 (COMAR 14.15.01 - 14,15,11). 1986.

## Watershed Management Documents

Forty-six of the fifty three affected local units of government have prepared ordinances and plans consistent with critical area criteria. These may be obtained from their planning departments.

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### Notes:

The following counties are within the Chesapeake Bay Critical Area:

Ann Arundel County	Dorchester County	St. Mary's County
Baltimore County	Harford County	Somerset County
Calvert County	Kent County	Talbot County
Carolina County	Prince George's County	Wicomico County
Cecil County	Queen Anne's County	Worcester County
Charles County		

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The following municipalities are within the Chesapeake Bay Critical Area:

Annapolis	Elkton	Oxford
Baltimore City	Federalsburg	Perryville
Betterton	Fruitland	Port Deposit
Cambridge	Greensboro	Princess Anne
Centreville	Havre de Grace	Queen Anne (Town)
Charlestown	Hillsboro	Queenstown
Chesapeake Beach	Indian Head	Rock Hall
Chesapeake City	Leonardtwn	St. Michaels
Chestertown	Mardela Springs	Secretary
Church Hill	Millington	Sharpstown
Crisfield	North Beach	Snow Hill
Denton	North East	Vienna
Easton		

## Nebraska Natural Resource Districts

### Agency

**Agency:**

Nebraska Natural Resource Districts  
National Association of Resource  
Districts

**Telephone:**

(402) 476-2729

**Address:**

1327 H Street

**Fax Telephone:****City-ST-Zip:**

Lincoln, NE 68508

**Contact Person:**

Paul Zilig

**Notes:**

Don't have a comprehensive watershed management program.

### Year and Method of Establishment

The Nebraska legislature created laws in 1969 that combined 154 special interest groups into 24 Natural Resource Districts. In 1989 the number was reduced to 23 due to a merger. These Districts became operational in 1972.

### Mission Statement/Strategic Focus

As stated by the Statutes Relating to the Natural Resource District, the purpose of the Districts are to cover: erosion prevention and control; prevention of damages from floodwater and sediment; flood prevention and control; soil conservation; water supply for any beneficial uses; development, management, utilization, and conservation of groundwater and surface water; pollution control; solid waste disposal and sanitary drainage; drainage improvement and channel rectification; development and management of fish and wildlife habitat; development and management of recreational and park facilities; and forestry and range management.

### Geographic Scale

Encompasses the entire state of Nebraska. Individual NRDs vary in size from district to district.

## **Mechanism for Intergovernmental Coordination**

Inter-local agreements with other agencies, voluntary cooperation

## **Sources of Funding and Budget Information**

The NRDs possess the authority to levy property taxes to fund their programs. The NRDs will also combine and receive funds from other state, local, or federal agencies.

90% from local property tax, 2% federal income at \$8 million annually.

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## **Management**

### **Management Structure**

The NRDs have directors that are elected by local voters, and serve for a four-year term while governing the activities of the District.

In order to bring together all of the NRDs, the Nebraska Association of Resource Districts (NARD) was created in 1972. This association is governed by a board of elected delegates representing each of the 23 NRDs. The responsibilities of the NARD include: to represent the NRDs and their viewpoints at the Nebraska Unicameral, United States Congress, and any other governmental agencies where the natural resource policies of Nebraska are being reviewed and legislatively impacted with various environmental programs; to provide service and materials to the districts which can aid in the implementation of district goals and district operation (such as economical retirement, insurance, and benefit package for NRD staff allowing more local dollars to be spent on projects involving conservation); and to provide director training, workshops, and citizen environmental awareness programs.

### **Degree of Authority**

The NRDs are involved in monitoring and managing Nebraska's surface and groundwater resources. They possess the authority to establish regulations concerning controlling groundwater usage. The NRDs may also form a rural water district to supply for domestic, industrial, and livestock uses. The NRDs are the agencies responsible for organizing and administering these rural water districts in order to provide for a potable supply of water. The NRDs may implement a variety of legislative and administrative programs that allow for the maintenance of a high degree of water quality. The NRDs provide for water quality testing and monitoring programs of rural wells to determine the quality of water supplies and to inform people of potential hazards. NRDs may also ask for and establish areas for special protection due to contamination. Each NRD is required to inspect and certify that all

irrigation systems which pump agricultural chemicals through closed piping comply with the Nebraska Chemigation Act. This act was created in order to mitigate groundwater contamination through the use of irrigation practices. The NRDs sponsored programs aimed at helping the farmer control erosion through conservative soil practices. The NRDs, either alone or with state and federal agencies, build and operate flood control structures. These structures could include dams, reservoirs, levees, dikes, or linear parks along rivers or streams.

### **Management Techniques**

Each NRD has a Ground Water Management Plan that documents resources, establishes management techniques, and protects the groundwater.

### **Enforcement Mechanisms**

No authority over floodplain or zoning authorities.

### **Design of Data Collection Efforts**

NRDs measure and record groundwater levels.

### **Monitoring System**

Studies to determine overall quality

### **Representative Projects**

Many of the NRDs administer the PL 556 - Watershed Program with the Soil and Conservation Service. Under this program, the whole watershed is designated as under the need of protection. Grade stabilization and flood control dams could be implemented to help to slow down the rainwater runoff flowing into rivers and streams. By controlling flooding there is hope that overall soil erosion will be reduced.

### **Grassroots Involvement**

Most NRD board meetings are covered by the media and news releases are often sent to local TV stations, radio stations, and newspapers. Information about the NRDs may be maintained through newsletters, brochures, and visiting speakers. Many of the NRDs will provide displays at various community events. NRDs participate in National Soil and Water Stewardship Week by distributing packets of soil and water conservation materials to schools and churches. There are also educational programs to help both students and teachers become more aware of the natural environment. Many of the NRDs provide scholarships to high school students who pursue a career in the



field of natural resources and teachers who attend environmental education courses or workshops by the NRD themselves.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

Indirect through State - i.e, clean lake study very important to have.

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## **Sources**

### **Key Enabling and Governance Documents**

Groundwater Management Act

Nebraska Chemigation Act

Erosion and Sediment Control Act

Statutes relating to Instream Appropriations

### **Watershed Management Documents**

None

### **Closing Notes**

The 23 NRDs are:

Central Platte NRD	Lower Platte South NRD	South Platte NRD
Lewis and Clark NRD	Lower Republican NRD	Tri-Basin NRD
Little Blue NRD	Middle Niobrara NRD	Twin Platte NRD
Lower Big Blue NRD	Middle Republican NRD	Upper Big Blue NRD
Lower Elkhorn NRD	Nemaha NRD	Upper Elkhorn NRD
Lower Loup NRD	North Platte NRD	Upper Loup NRD
Lower Niobrara NRD	Papio-Missouri River NRD	Upper Republican NRD
Upper Niobrara White NRD	Lower Platte North NRD	

**Wisconsin Nonpoint Source Water Pollution Abatement Program****Agency****Agency:**

Wisconsin Dept. of Natural Resources  
Nonpoint Source and Land Mgmt.  
Section

Bureau of Water Resources Mgmt.

**Address:**

101 S. Webster Street  
P. O. Box 7921

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Madison WI 53707-7921

**Telephone:**

(608) 266-9254

**Fax Telephone:**

(608) 267-2800

**Contact Person:**

Rebecca R. Wallace, P.E., Chief

**Notes:****Year and Method of Establishment**

The Wisconsin Nonpoint Source Water Pollution Abatement Program was enacted by the state legislature in 1978 under S. 144.25 of the Statutes and Chapter NR 120, Wisconsin Administrative Code. It is part of a larger program that provided federal and state funding for pollution cleanup, known as the Wisconsin Fund.

**Mission Statement/Strategic Focus**

The Wisconsin Priority Watersheds Program deals with entire watersheds on a selective or priority basis and strives to control every significant source of nonpoint pollution in these watersheds.

There are three basic premises that shape the program:

1. It must be comprehensive. All critical nonpoint sources must be controlled.
2. Because of the comprehensive nature of Wisconsin's program and the emphasis on water quality goals, the nonpoint source control program is separate from existing soil conservation programs. The two are coordinated through a Memorandum of Understanding.
3. Nonpoint source pollution control is, by definition, a water quality program. As such, it requires strong technical involvement by Wisconsin DNR, the state water quality agency.

## **Geographic Scale**

The program covers the entire state. By 1992, fifty-six watersheds, ranging in size typically from 100 to 300 square miles, had been designated as priority watersheds by the Department of Natural Resources.

## **Mechanism for Intergovernmental Coordination**

The program requires coordinated implementation on a voluntary basis from the state and federal agencies; municipal, county and town governments; and landowners and land operators. The two primary state agencies involved, the Department of Natural Resources and the Department of Agriculture, Trade and Consumer Protection, are tied together by MOU to assure coordination. Local governments are responsible for local implementation. Landowners and municipalities that participate voluntarily receive educational and technical assistance plus 50% to 70% cost sharing from state funds to install approved management practices.

## **Sources of Funding and Budget Information**

The source of funding is the Wisconsin Fund, set up in 1978 to pay for major pollution cleanup programs in the state. It is also responsible for funding the state's point source reduction efforts. The nonpoint program is known as the Wisconsin Nonpoint Source Water Pollution Abatement Program. From FY 1979 through FY 1987, at a time when the program had 29 priority watersheds, the state had allocated \$36 million to the program, less than 20% of which was spent on administration.

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## **Management**

### **Management Structure**

The program is administered by the Department of Natural Resources through the Nonpoint Source and Land Management Section of the Bureau of Water Resources Management. Each watershed plan has five major components that mirror the overall state program:

1. A statement of program purpose and objectives
2. Establishment of criteria for project selection
3. A plan stating objectives and identifying critical pollution sources
4. Program and project administrative structure
5. State budget support

The management plan is a cooperative, coordinated system administered by the Department of Natural Resources. The counties, participants in the preparation of the watershed assessment which is the basis for the plan, participate in the planning process via resolution of the County Boards of Supervisors. The counties enter into agreements with DNR for the purpose of receiving funds for management, enforcement, and cost-sharing with private property owners and land operators.

### **Types of Authority**

The program essentially is a voluntary program that works to recruit at least 75% of the property owners or operators that create nonpoint problems. Counties and municipalities are encouraged to enact or strengthen erosion control ordinances and stormwater management plans. Some may be asked to enact special ordinances governing the control of animal waste.

The primary vehicle for implementation is the cost share agreement between the county and the property owner/operator. It specifies a package approach to the installation of Best Management Practices to ensure that all forms of pollution reduction are employed, rather than those viewed as most desirable by landholders.

### **Management Techniques**

The purpose of the program is to control nonpoint source pollution in a systematic manner so surface and groundwater quality goals can be accomplished within a reasonable time frame. The program is designed to deal with the wide variety of nonpoint sources that exist throughout the state including sediment from croplands, construction sites, stream banks, and grazed woodlots; nutrient loads from barnyard runoff, cropland runoff, manure spread on croplands, and runoff from city lawns and streets; and heavy metals and other toxic substances in stormwater runoff from various urban sources.

The three major program objectives are to:

1. Identify the most effective approach for achieving specific water quality objectives and to provide adequate financial and technical assistance to landowners and operators for installation of approved nonpoint source control practices
2. Provide coordination between the nonpoint source pollution control program and other state water quality programs
3. Focus limited technical, educational and financial resources on critical geographic areas

The DNR uses six selection criteria to select priority watershed projects. They are:

1. Severity of the water quality problems
2. The magnitude of the pollutant load and potential for significant reduction

3. Willingness of landowners to participate
4. Willingness of local government to participate
5. Willingness and capability of local government to control nonpoint pollution; for instance, their willingness to enact erosion control ordinances for construction sites
6. Potential public use and benefits that will result from the project

The watershed project covers an eight to nine year period. Following approval of the watershed plan, three years are allotted to recruiting landowners to participate and entering into agreements to install the practices. They then have up to five years to install the BMP systems.

The state cost-share rates for Best Management Practices are as follows:

Best Management Practice	Flat Cost-Share Rate
Contour Farming.....	\$6.00/ac.
Strip Cropping.....	\$12.00/ac.
Field Strip Cropping.....	\$10.00/ac.
Reduced Tillage.....	\$15.00/ac. 1
Reduced Tillage.....	\$45.00/ac. 2

1. Reduced tillage systems for short crop rotations, and establishment of forages and small grains (Includes no-till).
2. Reduced tillage systems for continuous row cropping or long rotations (does not include no-till).

Best Management Practice	State Cost-Share Rate	
<u>Rural BMPs</u>		
Contour Farming.....	50%	*
Contour Strip Farming .....	50%	*
Field Strip Cropping.....	50%	*
Field Diversions and Terraces.....	70%	
Grassed Waterways .....	70%	
Reduced Tillage.....	50%	
Critical Area Stabilization .....	70%	1
Grade Stabilization Structures.....	70%	
Agricultural Sediment Basins.....	70%	
Shoreline and Streambank Stabilization.....	70%	
Shoreline Buffers .....	70%	1
Barnyard Runoff Management.....	70%	
Animal Lot Relocation.....	70%	
Manure Storage Facilities.....	70%	**
Livestock Exclusion from Woodlots .....	50%	
Wetland Restoration.....	70%	1
Roofs for Barnyard Runoff Management & Manure Storage Facilities .....	70%	
Nutrient and Pesticide Management.....	50%	2
<u>Urban BMPs</u>		
Critical Area Stabilization .....	70%	3
Grade Stabilization Structures.....	70%	
Shoreline and Streambank Stabilization.....	70%	
Shoreline Buffers .....	70%	3
Wetland Restoration.....	70%	3
Structural Urban Practices.....	70%	4
Street Sweeping .....	50%	5

1. Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs.
2. Spill control basins have a cost-share rate of 70 percent.
- \* Wildlife habitat restoration components of this practice are cost-shared at 70 percent.
- \*\* Maximum cost-share amount is \$10,000 including no more than \$5,000 for manure transfer equipment.
3. Easements may be used in conjunction with these practices.
4. Applies only to structures for established urban areas. Established urban surfaces are considered to be those in existence prior to the date the DNR approves the watershed plan.
5. This is an alternative best management practice not listed in NR 120 of the Wisconsin Administrative Code..

The projected total budget for the rural portion of the watershed plan includes capital costs, easements, local government costs, information and education, and other direct costs.

**Priority Watershed Plans  
Urban Strategies Eligible for Funding**

Urban Strategy	Flat Cost-Share Rate
Development of Construction Erosion Control Ordinances .....	100%
Development of Stormwater Management Ordinances .....	100%
Engineering Studies for Existing Urban Areas; Studies for Planned Urban Areas .....	100% 1
Design and Engineering for Structural BMPs .....	100%
Local Enforcement Staff.....	100% 2
Staff for Accelerated Street Sweeping.....	100% 2
Development of Alternative Financing And Admin. Strategies ..	100%

1. Funding not available for components dealing exclusively with drainage and flooding.
2. Funding limited to five years. Level of staffing based on a work plan submitted by local units of government and approved by the DNR.

Landowners, land operators, villages, cities, counties, and state agencies all have a hand in implementing the program. Their major responsibilities are as follows:

**Landowners and Land Operators:** Adopt Rural Best Management Practices which reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources.

For the urban program, private landowners in certain circumstances will install BMPs on their property.

**Villages and Cities:** For the rural program, enact a manure storage ordinance meeting the provisions outlined by the Department of Agriculture, Trade and Consumer Protection in Ag 166.98. The intent of this ordinance is to prevent pollution of groundwater by poorly designed and constructed animal waste storage facilities.

For the urban program, there are two parts to the program, a set of core programs and segmented programs (those projects requiring site specific investigations prior to implementation). The core tasks are to:

- Enact an adequate construction erosion ordinance
- Develop and implement a community specific program of urban housekeeping practices that reduce urban nonpoint source pollution
- Implement the information and education strategy

The segmented program tasks are to:

- Identify high priority segments the community wishes to pursue in existing and planned urban areas, including an evaluation of source reduction and financing
- Conduct engineering feasibility and site location studies for high priority areas
- Adopt, administer, and enforce a comprehensive stormwater management ordinance
- Enter into cost-share agreements for eligible BMPs
- Conduct detailed alternative financing/implementation studies which determine the means to pay for administering nonpoint source control program in each municipality

**Counties:** For the rural program:

- Develop farm conservation plans consistent with the needs of the project
- Enter into nonpoint source cost-share agreements with eligible landowners and enforce the terms and provisions of the agreements and management their reimbursement
- For county-owned and operated lands, enter into cost-share agreements with the DNR to correct identified nonpoint sources and fulfill their obligations as cost-share recipients
- Design best management practices and verify proper practice installation
- Prepare and submit annual work plans and an annual work load analysis and grant application to the Department of Agriculture, Trade and Consumer Protection
- Prepare and submit annual resource management reports to monitor implementation by tracking changes in the nonpoint source inventory and quantifying pollutant load reductions which result from installing BMPs.
- Conduct the information and education activities identified in the plan for which they are responsible

For urban areas, the counties must take the same urban actions as municipalities for their unincorporated areas.

**Department of Natural Resources:** DNR responsibilities include project administration, financial support via local assistance grant agreements and nonpoint source grant agreements; project evaluation; technical assistance; assisting county staff with site reviews of projects affecting wetlands or groundwater; and assisting county staff with the integration of fish and wildlife management concerns into the BMPs.

**Department of Agriculture, Trade and Consumer Protection:** The DATCP role is identified in s. 144.25, stats, ch. 92 stats; and NR 120. The major responsibilities are: manage a training program for the staff involved in implementation; act as a



clearinghouse for information related to agricultural BMPs, sustainable agriculture and nutrient and pest management; assist in carrying out the information and education programs, assist in identifying watershed participants subject to federal or state conservation compliance programs; assist counties in developing manure storage ordinances; assist in developing technical standards for agricultural BMPs; and assist in evaluating the site specific practicality of implementing rural BMPs.

### **Management Techniques**

This is a management plan for the abatement of rural nonpoint source pollution. The Best Management Practices employed generally use specific standard specifications included in the Soil Conservation Service Field Office Technical Guide. Additional specifications may apply. The techniques used include:

Contour Farming	Grade Stabilization Structures
Contour Strip Cropping	Agricultural Sediment Basins
Field Strip Cropping	Shoreline and Streambank Stabilization
Field Diversions and Terraces	Shoreline Buffers
Grassed Waterways	Barnyard Runoff Management
Reduced Tillage	Animal Lot Relocation
Critical Area Stabilization	Manure Storage Facilities
Livestock Exclusion from Woodlots	Wetland Restoration
Roofs for Barnyard Runoff Management & Manure Storage Facilities	Nutrient and Pesticide Management

### **Enforcement Mechanisms**

Wisconsin DNR has the power to review and approve local plans, including all aspects of administration and management. Stormwater management plans must be consistent with the state model ordinance and must meet pollutant reduction goals. Individual BMPs are controlled via contract. Landowners or operators required to participate but who do not would lose the cost-share arrangement in favor of a low-interest loan program.

### **Monitoring System**

The plan includes a regimen for monitoring both administrative and pollutant load management systems. The County is primarily responsible for administrative and pollutant load tracking. The system using CAMPS, the Computer Assisted Management and Planning System, developed by SCS.

### **How Long Has the Plan of Management Been in Force?**

This program was enacted in 1978.

## **Representative Projects**

There are fifty-six priority watershed plans in practice or under development. Four examples—Lower East Branch Pecatonica River, Black Earth Creek, Milwaukee River, and Menomonee River—are included as separate profiles in this report.

## **Grassroots Involvement**

DNR convenes advisory subcommittees to assist in preparing the plan. Acting primarily as a policy guidance group, the committee also reviews plan chapters. Members include representatives of local governments, conservation groups, interested citizens, and utility and planning agencies. Each plan has an extensive program built in for raising awareness and providing information. It uses printed materials, audio-visual programs, exhibits, media, tours, demonstrations, signs, workshops, meetings, and youth education. Sub-groups targeted include rural landowners and operators, local governments, urban residents, business and industry, and youth. The program is tailored for each sub-group and designed by the University of Wisconsin Extension.

## **Program Benefits Identified to Date**

Results over the first eight years indicate pollutant load reductions of 50% to 70%.

## **Assistance Provided by US EPA; Assessment of Value of the Assistance**

US EPA has funded many of these plans in part through the Section 319 program. The assistance is considered very valuable by the State.

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## **Sources**

### **Key Enabling and Governance Documents**

Section NR 120.08(2)(cr) of the Wisconsin Administrative Code. 1978.

### **Watershed Management Documents**

*Nonpoint Source Evaluation Monitoring Activities.* Prepared by the Wisconsin Department of Natural Resources. March 1991. Publication WR-279-91.

*Fields and Streets,* the Newsletter for Wisconsin's Nonpoint Source Water Pollution Abatement Program. Wisconsin Department of Natural Resources.

*Nonpoint Source Pollution: Where To Go with the Flow: Wisconsin's Challenge for the Next Decade.* Wisconsin DNR Special Report. January-February 1986.

## Vermont Nonpoint Source Management Program

### Agency

**Agency:**

Vermont Agency of Natural Resources  
Dept. of Environmental Conservation  
Water Quality Division

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**Address:**

Building 10 North  
103 South Main Street

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Waterbury, CT 05671-0408

**Contact Person:**

Stephan B. Syz

**Notes:**

This analysis is based in part on a document entitled *Vermont Nonpoint Source Management Program; Phase One of the State Clean Water Strategy*, dated August, 1988. A newer version of this report was released at press time. Germane data will be included in the print version of this report.

### Year and Method of Establishment

The Vermont Nonpoint Source Management Program was prepared in response to the federal Clean Water Act Amendments of 1987. It is a state program managed by the Vermont Agency of Natural Resources, Department of Environmental Conservation. The process which led to the enactment of this program was commissioned by the Secretary of the Vermont Agency of Natural Resources. It is part of the Vermont Clean Water Strategy.

The Secretary commissioned the Vermont Nonpoint Source Task Force and directed it to perform two tasks: (1) using a public process, identify priority or targeted waterbodies to be emphasized in future nonpoint programs, and (2) review the technical and programmatic adequacy of nonpoint source control measures, including best management practices and implementation programs. Vermont is one of the first states with an EPA-approved NPS program. It was approved in March 1989.

### Mission Statement/Strategic Focus

The goal of this program is to meet the spirit and intent of the Federal Clean Water Act. The program is seeking to make every stream and water body in the state suitable for all uses. The review processes completed by the state indicate that the following nonpoint problems exist and are the priorities for action in this plan:

**Surface Waters**

Siltation and turbidity  
 Nutrients  
 Flow alteration  
 Noxious aquatic plants

**Groundwater**

Pollutants originating from landfills  
 Petroleum product storage or transport  
 Human waste disposal systems

**Geographic Scale**

The Vermont program is statewide in scope, addressing 17 separate watershed basins, some lake drainage and some river and stream drainage. The plan covers the state's 5,264 stream miles; 600 lakes and ponds over five acres in area, covering 228,383 total acres (including Lake Champlain at 174,175 acres); and approximately 220,000 acres of wetlands. Focal points of the planning and management efforts are the state's twelve regional planning and development commissions; fourteen natural resource conservation districts, and five district fisheries managers, part of the Vermont Department of Fish and Wildlife. The average size of the water basins is 565 square miles.

**Mechanism for Intergovernmental Coordination**

None specifically defined.

**Sources of Funding and Budget Information**

As of December 1992, Vermont had received \$645,700 from US EPA for Section 319 during FY 1991-1992. Additional funding from EPA was provided from Section 205 (j) and 604(b) funds. Most of this funding is passed through to municipalities and the regional planning and development commissions. The Lake Champlain Special Designation Act provides \$25 million to address lake-wide pollution control projects, of which \$265,000 was allocated in 1991 to three nonpoint source projects. The USDA operates several programs aimed at reducing agricultural pollution, including the Rural Clean Water Program. The most aggressive program in the state, for the St. Albans watershed, has resulted in signed contracts from farmers covering 35% of the watershed at a cost of \$2.2 million.

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**Management**
**Organizational Structure**

Vermont's Nonpoint Source Management Program is a straightforward implementation of EPA's guidance on nonpoint management as governed by the 1987 Clean Water Act

**Amendments.** Similarly to the successful Wisconsin program, Vermont has completed a process of assessment and identification, followed by a program for installation of BMPs, local coordination, coordination with other state and federal agencies, active educational programs, regular monitoring, and continued planning. Because the state is more homogeneous than many and has a small population, it is not wracked with the extreme burdens of large scale combined sewer overflows, and can concentrate its program on the rural parts of the state.

### **Types of Authority**

Vermont is one of the few states in which land use control authority resides at the state level. The state has also adopted many different programs that address nonpoint source problems wholly or in part. The Lake Champlain Special Designation enables the state to pursue special programs to monitor and control phosphorus loading, a significant problems, and to attack a noxious plant the Eurasian Milrift, that threatens 12% of the state's larger lake acreage.

One program that is unusual compared to other states is a system for identifying high priority river basins, establishing river management goals, and applying those standards for hydroelectric facility relicensing by the Federal Energy Regulatory Commission. Hydroelectric relicensing is a major water resource issue in Vermont, but FERC historically overrides state concerns on the environmental impacts of hydropower development in favor of increased power production. The program, is designed to address directly language in the Federal Power Act that says FERC may adopt state comprehensive plans that address all river uses, including hydropower uses. This proposes a "highest and best use" strategy that designates some rivers for hydropower development and others for other public purposes.

In Vermont four rivers have had comprehensive river plans prepared that will lead to local river protection efforts, may include hydropower relicensing sensitive to state concerns. These rivers will be focal points of nonpoint source management programs.

### **Management Techniques**

The nonpoint program uses six basic management systems to achieve its goals. They are education, financial assistance, technical assistance, monitoring and evaluation, regulatory enforcement and oversight, and continued planning. As with other state nonpoint programs, it identifies certain impaired and threatened surface and ground water areas as water resources of primary concern. Eighty-seven surface water bodies and four groundwater bodies are accorded this distinction.

The state has adopted ten sets of Best Management Practices which apply directly to the nonpoint source program. They are:

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**Best Management Practice ..... Responsible Agency/Department**


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Agricultural Acceptable Management Practices	VT Department of Agriculture
Acceptable Management Practices for Silviculture	VT Dept. of Forests, Parks, and Recreation
Policy on Gold Dredging	VT Agency of Natural Resources
Rules and Standards for Septic Systems	VT Agency of Natural Resources
Procedures for Bridge Cleaning	VT Agency of Transportation
Soil Erosion and Sediment Control on Construction Sites Handbook	VT Department of Environmental Conservation
Standards for Ground Water Protection	VT Department of Environmental Conservation
Standards for Ski Trail Erosion Control	VT Dept. of Forests, Parks, and Recreation
Policies for Controlling Spread of Nuisance Aquatic Plants	VT Department of Environmental Conservation
Wetland Rules	VT Department of Environmental Conservation

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The 305(b) report prepared in December 1992 defines a four-year action plan to address nonpoint issues. The program, which includes budget estimates for the period, is outlined in the following table.

### **Enforcement Mechanisms**

Best Management Practices are installed under contract with a managing agency. The contract itself is one device to assure implementation. However, most BMP programs are voluntary, and may get no more than 15 percent of the watershed's land area under contract. Other than that, the state has full authority to carry out its regulatory and monitoring systems.

### **Monitoring System**

Monitoring programs are built into all phases of the program.

**Vermont Nonpoint Source Management Program  
Program and Funding Projections 1989-1992**  
(Taken from Vermont NPS Management Program 8/88)

Major Priority Action Program	Available Funds 1989	Needed 1990	Needed 1991	Needed 1992
Control/Reduce Agricultural Land Runoff	\$ 2,000,000	\$ 2,800,000	\$ 2,800,000	\$ 3,700,000
Control/Reduce Erosion/Sedimentation from Construction Sites & Logging Operations	65,000	55,000	75,000	55,000
Reduce River Flow Alteration & Regulation Impacts	75,000	145,000	95,000	95,000
Reduce Threat, Control Spread & Alleviate Impairments Caused by Eurasian Milfoil	82,000	472,000+	465,000+	465,000+
Lake Champlain Phosphorus Management Strategy	850,000	Unknown	Unknown	Unknown
Lake Watershed Growth Management	157,000	90,000	90,000	90,000
Correction of CSO Problems	14,000,000	20,000,000	29,000,000	31,000,000
Landfill Assessment and Management	890,000	1,900,000	Unknown	Unknown
Management/Remediation of Hazardous Sites and Generators	2,500,000	4,100,000	4,100,000	4,100,000
Protection of Wetlands	40,000	185,000	185,000	185,000
Ground Water Management & Protection	130,000 (Needed) 25,000	1,600,000+	1,600,000+	1,600,000+
Aquatic Toxicity Assessment	25,000	50,000	50,000	50,000
Reduce Impacts of Hydroelectric Modifications in Upland Areas	5,000	75,000	75,000	75,000
Design/Implement Atmospheric Deposition Monitoring (Acid and Toxic Forms), Seek Federal Adoption of Emission Standards	50,000	150,000	150,000	150,000
Reduce/Eliminate Failed Septic Systems	40,000	175,000	175,000	175,000
<b>Total Funding Available/Needed</b>	<b>\$20,934,000</b>	<b>\$31,797,000+</b>	<b>\$40,760,000+</b>	<b>\$43,640,000+</b>

**How Long Has the Management Program Been in Force?**

The document was approved by US EPA in March 1989.

## **Representative Projects**

Vermont is one of the few states that have enacted shoreland zoning programs. These require local governments to establish setback and management systems for development, including agriculture, around lakes larger than five acres. This technique is applicable to the lake watershed growth management program listed above. The state also uses an agricultural BMP program similar to that used in Wisconsin.

## **Grassroots Involvement**

The process to identify priority watersheds included twelve regional workshops and one statewide meeting. The Nonpoint Source Task Force consisted of twenty representatives from diverse organizations, including four state agencies, municipal governments, industry and tourism groups, environmental and planning organizations.

## **Program Benefits Identified to Date**

Vermont reports several benefits from the nonpoint program to date. They include: establishment of minimum flows below hydroelectric facilities through the comprehensive rivers planning initiative, lake water quality protection efforts, the designation of three outstanding resource waters and reclassification of two stream segments from Class B to Class A.

## **Assistance Provided by US EPA; Assessment of Value of the Assistance**

Vermont has received \$645,700 from US EPA for Section 319 projects during FY 1991-1992. Funding from EPA was provided from Section 205 (j) and 604(b) funds. Most of this is passed through to municipalities and the regional planning and development commissions. The funding appears to be critical to the success of the program.

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## **Sources**

### **Key Enabling and Governance Documents**

Vermont Nonpoint Source Management Program; Phase One of the State Clean Water Strategy. Vermont Agency of Natural Resources, Department of Environmental Conservation, Water Quality Division. Waterbury, Vermont. August 1988.

### **Watershed Management Documents**

1992 Water Quality Assessment (Section 305(b) Report). Agency of Natural Resources, Department of Environmental Conservation, Water Quality Division. Waterbury, VT. December 1992.



### **Part III.**

## **Profiles of Sub-State or Regional Programs**

- H Cape Cod Commission – MA
- H New Jersey Pinelands Commission – NJ
- H Northwest Florida Water Management District – FL
- H Phoenix Active Management Area – AZ
- H South Florida Water Management District – FL
- H Southwest Florida Water Management District – FL

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**Cape Cod Commission, MA**

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Thomas C. Cambareri  
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**Notes:**

The focus of the Cape Cod Commission is on groundwater protection.

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**Year and Method of Establishment**

The Cape Cod Commission was formally approved as the regional land use regulatory agency for Barnstable County and its incorporated municipalities in 1990. Prior to that time, it had operated as a regional planning and advisory agency. The Commission had been formed initially by Act of the Massachusetts legislature.

The voters of Barnstable County moved the Commission from being a normal regional planning agency with advisory powers to one with regulatory powers due to the impacts of development and growth on the Cape, and concern about the regions resources, especially its water supply.

**Mission Statement/Strategic Focus**

The Commission is empowered with three responsibilities: (1) regulatory control of developments with regional impact (DRIs); (2) comprehensive planning services for the county and its political subdivisions; and (3) technical services in support of the regulatory and comprehensive planning programs. The Regional Policy Plan sets the minimum performance standards for land use/growth management, natural resources, economic development, community facilities and services, affordable housing and historic preservation.

The Regional Plan has two goals related to water quality and nonpoint sources of pollution:

1. Maintain the overall quality and quantity of Cape Cod's ground water to ensure a sustainable supply of high quality untreated drinking water and to preserve and improve the ecological integrity of marine and fresh surface waters
2. Encourage the use of public and private sewage treatment facilities in appropriate areas where they will provide environmental or other public benefits and where they can be adequately managed and maintained

### **Geographic Scale**

The Commission is responsible for all of Barnstable, which is wholly the arm of Cape Cod. It is seventy in length and covers 399 square miles.

### **Mechanism for Intergovernmental Coordination**

The Cape Cod Commission is a regional commission empowered by the Cape Cod Commission Act under the laws of the Commonwealth of Massachusetts. The approval to regulate development proposals of regional impact and districts of critical planning concern was granted by the voters in 1988 and 1990. The Regional Policy Plan, which was required by the Legislative Enabling Act, sets minimum performance standards for land use and growth management and Local Comprehensive Plans.

### **Sources of Funding and Budget Information**

The Commission's Water Resources Program received about \$70,000 funding this year. It is drawn mostly from a variety of grant programs, both state and federal. The total budget is \$1.9 million drawn mostly from property taxes.

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## **Management**

### **Organizational Structure**

Each of the fifteen municipalities sends a representative to the Commission. They are joined by a Governor's appointee, a representative of the minority community, a Native American representative, and a County Commissioner.

### **Types of Authority**

The Commission has the authority to regulate Developments of Regional Impact (DRIs) and Districts of Critical Planning Concern (DCPCs). DRIs are projects, according to interim standards, that would construct thirty or more new housing units, or 10,000 square feet or more of new commercial space. DCPCs allow increased scrutiny on areas needing special attention. Adopting upon a nomination process, these areas may

possess a major public capital facility, or significant coastal, natural, historic, economic, cultural, archeological, architectural or recreational resources. They may also be areas with sensitive ecological conditions rendering them unsuitable for development.

The voting members of the Commission have the power to approve, approve with conditions, or disapprove permit applications falling under the scope of these thresholds.

The Commission is also empowered to prepare the Regional Policy Plan for the county. It is a plan emphasizing goals and objectives, rather than specific standards or techniques.

The Cape Cod Aquifer, which serves nearly all of Cape Cod, was designated by US EPA as a Sole Source Aquifer. The EPA and MA Department of Environmental Quality Engineering, in cooperation with the US Geological Survey, initiated the Cape Cod Aquifer Management Project to improve the coordination of groundwater management.

State programs that affect the management area include the Department of Environmental Protection's (DEP) Groundwater Discharge Permit Program, the Wellhead Protection Program, the Aquifer Lands Acquisition Program, and Massachusetts Environmental Protection Act. A detailed study of the safe yield of the aquifer is being completed under the auspices of the State Water Management Act. Once completed the DEP will regulate groundwater withdrawals to ensure a safe yield.

Finally, the municipalities each have their own land use plans that affect the management of nonpoint source water pollution.

### **Management Techniques**

The Commission sets minimum performance standards to meet important objectives pertaining to the protection of groundwater. One of these states that all development and redevelopment shall not exceed 5 ppm nitrate-nitrogen loading for impact on groundwater according to a Commission approved methodology.

Another is for *Wellhead Protection Areas*, defined as zones of contribution to existing public and community water supply wells. Maintaining the 5 ppm nitrate-nitrogen impact standard, the plan states that DRIs that generate more than 2000 gpd of sewage effluent may be required to perform a cumulative impact analysis according to Commission-approved methodology.

For these areas, commercial and industrial proposals that involve the use, treatment, generation, storage or disposal of hazardous waste or hazardous materials, with the exception of retail sales and household uses, are not permitted.

Public and private sewage or septage treatment is generally not permitted in these areas.

**Fresh Water Recharge Areas** consist of recharge areas to fresh water ponds. To control phosphorus inputs, 300 foot setbacks from these sites is required for subsurface disposal unless the applicant demonstrates by groundwater study that the site is not in a Fresh Water Recharge Area.

DRI's that generate over 2000 gpd of sewage effluent may be required to delineate ground water recharge areas to potentially affected fresh water ponds to identify and mitigate adverse impacts.

**Marine Water Recharge Areas** are nitrogen-sensitive embayments. Development proposals may be required to delineate the ground water recharge areas to downgradient embayments and other marine waters that may be nitrogen sensitive in order to avoid or mitigate adverse impacts.

Development and redevelopment shall not exceed identified critical nitrate-nitrogen loading standards for nitrogen impact on marine ecosystems. Proposals that would generate more than 2000 gpd of sewage effluent may be required to prepare a cumulative impact analysis, including flushing rate determination, prior to a permit being issued.

**Impaired Areas** are sites where ground water may have been degraded by point and nonpoint sources of pollution, including but not limited to unsewered residential developments where lots, on average are less than 20,000 sq. ft; landfills, septage and wastewater treatment plant discharge sites; high density commercial and industrial areas; and those downgradient areas where the ground water may have been degraded by these sources. All identified growth centers are also classified as Impaired Areas.

Generally, development shall meet the 5 ppm standard for nitrate-nitrogen loading for impact on ground water, but may increase to 10 ppm where it can be demonstrated that such increase will cause no significant adverse impact on wetlands, water bodies, public or private drinking water supply wells and potential water supply wells.

Where existing development exceeds 10 ppm, redevelopment of that property shall not increase the existing nitrate-nitrogen loading factor.

Public and private sewage treatment facilities and other similar remedial systems shall be encouraged to locate in Impaired Areas. The development of public or community water supply systems shall be encouraged for areas serviced by private wells in Impaired Areas.

**Water Quality Improvement Areas** are Impaired Areas that are located within Wellhead Protection Areas, Fresh Water and Marine Water Recharge Areas. In such areas, water quality improvement is a major goal. In these areas, development shall not

exceed 5 ppm of nitrate-nitrogen loading or an identified marine water standard as applicable. Where existing development exceeds that standard, redevelopment shall improve existing levels of nitrate-nitrogen loading. Public and private sewage treatment facilities may only be used in Water Quality Improvement areas within Wellhead Protection Areas to remedy existing problems.

**Potential Public Water Supply Areas** are sites identified as future well sites and their associated recharge areas. No development shall be permitted in the well site area and in the area within 400 feet of the potential well site. Within the recharge areas, the plan states that DRIs that generate more than 2000 gpd of sewage effluent may be required to perform a cumulative impact analysis.

For these areas, commercial and industrial proposals that involve the use, treatment, generation, storage or disposal of hazardous waste or hazardous materials, with the exception of retail sales and household uses, are not permitted. Public and private sewage or septage treatment is generally not permitted in these areas.

### **Enforcement Mechanisms**

Permits are subject to a strict and rigorous review process. Enforcement of the regional plan takes place through the appropriate authorities of agencies or units of government that identify violators.

### **Monitoring System**

The Commission maintains an active program in monitoring recharge and discharge zones in the county. Ground water observation wells are placed throughout the county and regularly sampled to track enforcement and current subsurface conditions.

### **How Long Has the Plan of Management Been in Force?**

The regional plan was adopted June 20, 1991.

### **Representative Projects**

The Commission's water resource office takes on many technical assistance projects that include watertable mapping, hydrogeologic landfill assessments, hazardous waste site management, wellhead protection delineations, non-point source nitrogen loading as well as supporting regulatory and comprehensive planning efforts of the Commission..

### **Grassroots Involvement**

Grassroots involvement comes through the participation by each of the municipalities in the voting decisions of the Commission, and the development of Local

Comprehensive Plans that are consistent with the Commission Regional Policy Plan and technical service outreach and assistance to the communities.

### **Program Benefits**

The system has been in place for less than two years. The impact on water quality is not yet known. Other benefits include approval conditions emplaced upon developments, adoption of a regional set of minimum performance standards, comprehensive land use planning, and supported technical assistance to the communities.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

Over the years, EPA has provided funding to the Commission for projects authorized under Sections 205(j), 604(b), and 319(h). Given the emphasis of the regional plan on protecting the sole source aquifer, the funding has been invaluable.

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## **Sources**

### **Key Enabling and Governance Documents**

Regional Policy Plan, County of Barnstable, Massachusetts. Prepared by Cape Cod Commission. Final Draft June 20, 1991.

### **Watershed Management Documents**

Nitrogen Loading. Technical Bulletin 91-001 (Final). Cape Cod Commission, Water Resources Office. Barnstable, MA. April 1992.

Sub-Marine Groundwater Discharge and Nitrate Loading to Shallow Coastal Embayments. in Proceedings of Focus, Eastern Regional Groundwater Conference, October 13-15, 1992, at the Newton Marriott, MA. Thomas C. Cambareri, Eduard M. Eichner, Craig A. Griffeth. Cape Code Commission. Barnstable, MA.

Draft Scope of Work for Watershed Delineations of Barnstable's Coastal Embayments. Cape Cod Commission, Water Resources Office. October 22, 1992.

**NW Florida Water Management District****Agency****Agency:**

Northwest Florida Water  
Management District

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**Notes:****Year and Method of Establishment**

The District is empowered under the Water Resources Act, enacted by the Florida legislature in 1972.

**Mission Statement/Strategic Focus**

The mission of the Northwest Florida Water Resource District is to implement the provisions of the 1972 Florida Water Resources Act, Chapter 373. The District goals include: to insure the adequate supply of water through the promotion of conservation, resource protection, and the development of alternative water supply; to enhance and protect natural systems through land management and water resource management; to minimize the harm caused by flooding; to improve the quality of available water resources; to encourage public participation and education concerning comprehensive water management; and to further develop the District's overall water management capabilities, and abilities that provide assistance to local agencies.

The focus of the profile is the Surface Water Improvement and Management Program (SWIM), a system authorized by the state legislature in 1987. It is a broad spectrum program designed to improve the water quality and related aspects of the state's surface waters. In terms of Northwest Florida, this becomes a comprehensive plan for the restoration and preservation of the Apalachicola River and Bay, Lake Jackson, Deer Point Lake, and the Pensacola Bay system.



## **Geographic Scale**

The District encompasses 16 counties stretching from the St. Marks River Basin in Jefferson County to the Perdido River in Escambia County. There are five major drainage basins located in the District. The total area contained within the District is 11,200 square miles.

## **Mechanism for Intergovernmental Coordination**

The District used technical advisory groups, an interstate coordination committee, and similar devices, depending on the issue facing the agency.

## **Sources of Funding and Budget Information**

Under Chapter 373 of the Florida Statutes, water management districts possess the authority to levy ad valorem taxes to support water management activities. The Northwest Water District is allowed 0.05 of a mil (five cents for every \$1,000 of taxable property) as a taxing authority limit.

Funds are also received from state general revenues, special grant programs and state land acquisition trust funds.

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## **Management**

### **Management Structure**

The District is served by a Governing Board, Executive Director, and Deputy Executive Director. The Governing Board is a nine-member unit appointed by the Governor, and confirmed by the Florida State Senate, whose primary function is to oversee the activities of the District. Board members serve four year terms, receive no salary, and may be reappointed. One member is selected from each of the five major hydrologic basins and four are selected at-large from throughout the District. The organization is also split into four different divisions: the Division of Resource Management, the Division of Administration, the Division of Land Management, and the Division of Resource Regulation.

### **Degree of Authority**

The District is authorized to participate in technical evaluations, develop basin management and special project plans, evaluate growth management plans of local governments, purchase and manage wetlands and related uplands, implement flood control, and regulate surface water management facilities, consumptive use of water,

aquifer recharge, and well construction. Technical assistance to state, county, or local governments is also provided when requested.

### **Management Techniques**

The SWIM program addresses five major program areas: nonpoint source pollution, point source pollution, habitat preservation and restoration, public education and awareness, and interagency coordination and cooperation. The program identifies watersheds on a priority basis for action. Targeted watersheds must have at least regional or state level significance.

### **Enforcement Mechanisms**

Regulatory program for some wetlands, encourage other agencies to enforce.

### **Monitoring System**

The monitoring system focuses at present on ambient surface waters. The District takes monthly samples, and at certain times, it may establish a monitoring network in specific areas.

### **Representative Projects**

Projects the District is currently engaged in or have recently completed include: the City of Tallahassee/Leon County Stormwater Management Plan, Escambia County Utilities Authority Ground Water Modeling Project, Surface Water Improvement and Management (SWIM) Plans, Ambient Ground Water Monitoring Program, Ambient Surface Water Monitoring Project, Renovation of Megginnis Arm Stormwater Treatment Facility, Megginnis Arm Sediment Removal Project, Interstate 10 Storm Water Treatment Facility, Jackson County Permitting Program, RUA Western Subregional Well Field, Apalachicola-Chattahoochee-Flint River Comprehensive Study, Apalachicola River and Bay Freshwater Needs Assessment, City of Quincy Stormwater Plan, delineation of Karst Features in Leon County, Waterways Educational Program, purchase of Garcon Point, Land Acquisition and Management, District-wide Abandoned Well Plugging Program, Regulations Protect the Water Resources of the Region, Analysis of Sediments Within Fords Arm, Permanent Outdoor Educational Displays for Lake Jackson, Leon County and City of Tallahassee Stormwater Monitoring Project, Diagnostic Feasibility Study for Lake Munson, and Restoration Plans for the Pensacola Bay Area.

### **Grassroots Involvement**

The District has two programs designed to help educate the public on comprehensive water management. The Water-Ways Educational Program entitled *WaterWays*:

*Exploring Northwest Florida's Water Resources* was extended into six additional counties in 1991. All of the public middle schools within the District receive these materials. Since its beginning the program has served as a model for other educational programs throughout Florida and the United States at large. The District also has educational displays at five boat landing sites at Lake Jackson. These displays include information concerning Lake Jackson and its surrounding resources. The purpose of these displays are to educate the public about the uniqueness of the lake and methods as to how to preserve and protect. These exhibits highlight the recreational, aesthetic, biological, and hydrological values of the lake.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

The District has received various grants in the past from US EPA, which the District has found to be very valuable.

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## **Sources**

### **Key Enabling and Governance Documents**

Chapter 373, Florida Statutes

1972 Florida Water Resources Act

### **Watershed Management Documents**

Lake Jackson Management Plan, effective December 1990

Pensacola Bay System S.W.I.M. Plan, adopted November 1990

Apalachicola River and Bay SWIM Plan, adopted May 1992.

Deer Point Lake SWIM Plan, adopted April 1991.

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**New Jersey Pinelands Commission**

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**Agency**

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New Jersey Pinelands Commission

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**Notes:**

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**Year and Method of Establishment**

Congress in 1978 created the Pinelands National Reserve and called upon the state of New Jersey to create a planning and management agency to carry out the effort. The New Jersey Legislature did that in 1979, creating the New Jersey Pinelands Commission. Its mission is to carry out the Pinelands Comprehensive Plan, a framework for protecting the natural resources, and particular the groundwater, of the 1.1 million acre area.

**Mission Statement/Strategic Focus**

The primary goal of the Pinelands Comprehensive Management Plan is to preserve, protect, and enhance the natural and cultural resources of the Pinelands. These resources include the quality and quantity of surface and ground water, characteristic landscape features, biological diversity, historic and archaeological sites, and compatible agricultural uses.

**Geographic Scale**

The Pinelands is located in southern New Jersey. It is 1.1 million acres in size and stretches through all or part of seven counties, and 56 municipalities. There are two management areas in the Pinelands, a core Preservation Area of 337,000 acres, and an outer Protection area covering the remainder of the acreage. Over 360,000 acres is presently in public ownership, including four areas covering 46,000 occupied by

military installations. The two aquifers underlying the Pinelands hold an estimated 17 trillion gallons of water, enough to cover all of New Jersey to a depth of ten feet.

### **Mechanism for Intergovernmental Coordination**

The NJ Pinelands Commission is enabled under state law as a state commission. There is also concurrent legislation from Congress that structures the management focus and techniques. The Commission has fifteen members—seven appointed by the Governor, one each appointed by the seven counties, and one appointed by the US Secretary of the Interior. The Commission also reviews and approves land use decisions made by the 56 municipalities.

The Commission has also entered into five memoranda of understanding to provide for coordinated management of various potential environmental hazards within the management area.

### **Sources of Funding and Budget Information**

The Pinelands are the beneficiaries of funding for land acquisition from the National Park Service. A sum of \$26 million was authorized in the 1978 legislation, of which \$8.25 million was made obligated immediately. The State of New Jersey also acquires land in the Pinelands through the Green Acres Fund, a voter-approved bond for acquisition. By 1991, nearly \$50 million was invested in land acquisition, purchasing a total of 63,400 acres. These funds do not pass directly through Commission accounts.

The Commission budget for FY 1991 was \$2,491,500, nearly all of which comes from state appropriations. The remainder comes from interest on investments, and \$15,000 from federal contracts.

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## **Management**

### **Management Structure**

See the section above on intergovernmental cooperation.

### **Types of Authority**

The Pinelands Commission likely possesses the most aggressive land use and preservation capabilities of any conservation body in the country. Its mandate includes the acquisition of 100,000 acres, and it has the power to review and approve land use controls that are as stiff as any around. Each of the land use plans of the seven counties and the 52 municipalities must conform to the Comprehensive Plan. At present, the seven counties and 49 municipalities have prepared conforming plans and ordinances.

The Commission also has project review responsibilities. In 1991, the Commission reviewed over 1,800 permit applications.

### **Management Techniques**

The Pinelands Comprehensive Plan is a major document covering fourteen distinct areas of natural resource and infrastructure management. With respect to the control of nonpoint pollution, the plan employs the following techniques:

Above and beyond individual elements, the Comprehensive Plan is designed to protect the area as a national reserve. The resource being reserved by Congress is the groundwater. Therefore, the land use plans, infrastructure management, Pinelands Development Credit plan, the land use plan, and the system for consistent state and federal permitting are all directly designed to protect the water resources of the Pinelands.

**Land Use.** Land use provisions are adopted that affect nonpoint sources of pollution:

- Minimum lot sizes ranging from 3.2 to 10 acres outside of municipal boundaries
- Lawn size restricted to 2,000 square feet (Minimize yard chemicals)
- Sharp frontage restrictions along waterbodies – 15 feet per 1,000 feet
- When using standard septic systems, minimum lot size is 3.2 acres and system is above groundwater levels
- When using innovative treatment systems, minimum lot size is at least one acre

**Water Quality.** The Comprehensive Plan governs point and nonpoint sources of water pollution. Nonpoint measures include:

- For on-site conventional septic waste water treatment systems, the location of the system and its discharge point, and the size of the parcel on which the system is located, will ensure that ground water exiting from the parcel or entering a surface body of water will not exceed 2 parts per million nitrate/nitrogen
- The depth to seasonal high water table is at least five feet
- For surface water runoff, the volume of runoff generated from the parcel by a 50-year/24 hour storm will not increase as a result of any development of the parcel
- Surface water runoff from impervious surfaces will be retained to facilitate infiltration into the ground water;
- Runoff shall not be recharged where depth to water table is more than 20 feet below the surface, wherever practical
- Excessively and somewhat excessively drained soils, as defined by the Soil Conservation Service, should be avoided for recharge of runoff wherever practical

- Regarding prohibited chemicals and materials, the use of septic tank cleaners and waste oil is prohibited
- Storage facilities for de-icing chemicals shall be lined to prevent leaking into the soil, and shall be covered with an impermeable surface which shields the facility from precipitation
- The application of herbicide to any road or public utility right-of-way unless necessary to protect an adjacent agricultural activity is prohibited
- No hazardous, toxic, chemical, petroleum (including oil spill pollutants), septic or nuclear waste or liquid sludge shall be discharged or disposed of on any land in the Pinelands, except as part of a land application of liquid sludge for agricultural purposes.

**Mineral Extraction.** Mining activities are governed by the following water quality related standard:

- Surface runoff will be maintained on the parcel in a manner that will provide for on-site recharge to groundwater

**Forestry.** Forestry standards are reasonably strict in the Pinelands. Water quality related standards are:

- Avoids wetland areas except as absolutely necessary
- Avoids stream crossings with high unstable banks
- Stream banks shall be stabilized during and after harvesting
- Culverts and bridges are temporary
- Trees that stabilize banks will remain standing
- A 25' vegetated buffer along streams, ponds, lakes, and marshes shall be maintained
- The use of active or intermittent stream channels for skidding of logs is prohibited
- Skidding shall not occur within 25' of streams, lakes, ponds, and marshes except for necessary crossings
- Accessways for forestry activities shall be located at least 100 feet from streams, ponds, lakes and marshes where practical
- Landings shall be located in well drained areas where practical, at least 200 feet from ponds, lakes, and marshes
- Filter strips shall be located between harvest areas, lands, and skid trails; and streams, ponds, lakes, and marshes

**Agriculture.** Best management practices are required for the following:

- Erosion and runoff
- Animal waste

- Fertilizers and pesticides

***General Standards for the Protection of Wetlands (Includes all water bodies).***

Wetlands include swamps, bogs, marshes, lakes and ponds, and rivers and streams. Development is prohibited in all such areas. A 300' buffer strip is also required around any such area. Significant adverse impacts (not allowable) include any of the following:

- An increase in surface water runoff discharging into a wetland
- A change in the normal seasonal flow patterns in the wetland
- An alternation of the water table in the wetland
- An increase in erosion resulting in increased sedimentation in the wetland
- A loss of wetland habitat
- A reduction in wetland habitat diversity
- A change in wetlands species composition
- A significant disturbance of areas used by indigenous and migratory wildlife for breeding, nesting, or feeding.

**Enforcement Mechanisms**

While the Commission reported over 1,800 permit applications and 13,500 inquiries in FY 1991, it also reported 136 violations, of which 67 had been resolved. Enforcement requires the coordination and cooperation of several state agencies, federal agencies and over 60 local governments.

The Commission is seeking additional authority from the state legislature for enforcement. Specifically, it is seeking the authority to issue administrative orders, levy fines, and withhold final approval on permits if persistent violations by an applicant at other sites have not been resolved.

**Monitoring System**

The Commission issues an annual surface water quality report based on gauge results at 175 testing stations located throughout the management area. This provides baseline data. It monitors twelve sites on the Great Egg Harbor River as part of the overall effort for the Great Egg National Scenic and Recreational River. It is designed to assess the hydrologic impact of sewerage in Monroe Township. It monitors ten sites in the Atsion River watershed in cooperation with the US Geological Survey as part of a similar effort to monitor sewerage impacts. The Commission is testing innovative septic systems to find more compatible alternatives to address the sandy soils and near-to-the-surface groundwater in many parts of the management area.



The Commission is also putting the finishing touches on a detailed long term monitoring program to assess the impact of the plan on the management area.

### **How Long Has the Plan of Management Been in Force?**

The comprehensive plan went into effect on January 16, 1981.

### **Representative Projects**

The primary Commission programs are for project review and review of ordinances, amendments, and variances. The new comprehensive monitoring program will be the basis for many long term Commission decisions.

### **Grassroots Involvement**

The Commission handles grassroots involvement through a citizens advisory committee and through its outreach program. In 1991, Commission staff and associated speakers reached over 5,000 people via 150 speaking engagements, field trips, and slide shows.

### **Program Benefits Identified to Date**

The Commission reports that 63,400 acres has been acquired through FY 1991. In addition, it estimates that 96% of all new homes have been located in regional growth areas and out of the sensitive preservation zones.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

None identified.

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## **Sources**

### **Key Enabling and Governance Documents**

National Parks and Recreation Act. P.L. 95-625, Section 502. 92 STAT. 3492. 1978.

Pinelands Protection Act. 1979 Senate No. 3091. Title 13 of the New Jersey Revised Statutes. June 28, 1979.

**Watershed Management Documents**

**New Jersey Pinelands Comprehensive Management Plan. New Jersey Pinelands Commission. November 1980.**

**An Assessment of Sewer and Water Supply Alternatives for Pinelands Growth Areas in the Mullica River Basin. New Jersey Pinelands Commission. 1988.**

**An Assessment of the Hydrologic Impact Resulting From Development in Regional Growth Areas in Hamilton Township, Atlantic County. New Jersey Pinelands Commission. August 1990.**

**Long Term Pinelands Monitoring Program; Task 1: Study Area Selection. New Jersey Pinelands Commission. April 1992.**

**A Brief History of the New Jersey Pinelands and the Pinelands Comprehensive Management Plan. Pinelands Commission. August 1989.**

**1991 Annual Report. New Jersey Pinelands Commission. New Lisbon, NJ. 1991.**

## Phoenix Active Management Area

### Agency

**Agency:**

Phoenix Active Management Area

**Telephone:**

(602) 542-1512

**Address:**

15 South 15th Avenue

**Fax Telephone:****City-ST-Zip:**

Phoenix, Arizona 85007

**Contact Person:**

Mark Frank, Area Director

**Notes:**

Plans for the Prescott, Pinal, and Tucson Active Management Areas are in most ways identical to the Phoenix AMA plan, and therefore they are not printed reported on here.

**Year and Method of Establishment**

Established in 1980 as a result of the Arizona Groundwater Code.

**Mission Statement/Strategic Focus**

The main goal of the Phoenix AMA is to obtain safe-yield of the area's groundwater by the year 2025 or before. Objectives of the Department include: to set water requirements which allow for the conservation efforts of all groundwater users; to provide the monetary and technical staff assistance for the implementation of water conservation of groundwater; design projects intended to increase the water supply of the AMA; to inform the public of water legislation, water demands and supplies, and the Tucson AMA; and to suggest a method by which alternative water supplies can be utilized.

**Geographic Scale**

The Phoenix AMA covers 5,646 square miles and is divided into seven sub-basins. The sub-basins include: East Salt River Valley, West Salt River Valley, Hassayampa, Rainbow Valley, Fountain Hills, Lake Pleasant, and Carefree. Most of the urban and agricultural activity of the area is centered around the East and West Salt River Basins.

## **Mechanism for Intergovernmental Coordination**

Water management functions of the area is performed by a number of different agencies. City, county, and regional governmental authorities exercise control over flood control, wastewater management, water production, water quality management, planning, and zoning. Federal water management involves the Bureau of Reclamation's activities in the construction of the Central Arizona Project (CAP), and the U.S. Environmental Protection Agency's Superfund and National Pollutant Discharge Elimination System (NPDES) permit programs. The U.S. Geological Survey assists with the collection of data. The Indian communities of Fort McDowell, Gila River, and Salt River Pima-Maricopa are all governed by their respective councils. Also there are several water groups and organizations whose role is significant to the conservation of groundwater resources.

## **Sources of Funding and Budget Information**

The Department of Water Resources and the Department of Environmental Quality are funded through the normal appropriations process by the state legislature. Information on allocations to this program were not immediately available.

Funding for water augmentation (the introduction of new water supplies), primarily from the federal Central Arizona Project, is tied to a complicated federal repayment mechanism that is not relevant to this analysis.

A separate fund known as the Augmentation and Conservation Assistance Fund provides for the collection of fees on groundwater withdrawals of up to \$2.00 per acre-foot per year. Monies in the fund designated for augmentation will be used to provide funds for augmentation projects and studies initiated or conducted by the Department of Water Resources, and for cost-sharing grants for augmentation projects and studies initiated or conducted by others. Revenues are projected to peak early at around \$2 million, then dwindle to \$1.3 million over time as conservation practices reduce demands for groundwater withdrawals.

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## **Management**

### **Management Structure**

The Department of Water Resources is empowered by the legislature to prepare and implement the Active Management Area plans. The program staff for the Active Management Area acts largely in a coordinating capacity designed to encourage the flow of public information and education and to encourage maximum participation in the program by the public.

## **Management Techniques**

This program is one that primarily provides for the acquisition, distribution and protection of public water supplies. While water quality management can logically be thought of as part of this process, it nevertheless is a small part of the overall program. The goal of the program is to manage the quality of the groundwater and to maximize the quantity of water available for beneficial use consistent with the overall goal of maximum safe yield. The water quality program has four objectives:

1. Protection of groundwater quality from degradation
2. Collect groundwater quality data on a continual basis
3. Identify areas of poor quality groundwater
4. Correct groundwater quality problems

The accompanying strategies to achieve these objectives are to:

- Prevent the introduction of contaminants to aquifers
- Prevent or minimize the migration of poor quality groundwater
- Monitor groundwater quality trends
- Encourage the beneficial use of poor quality groundwater
- In cooperation with the Department of Environmental Quality, oversee remedial action to correct groundwater quality problems
- Cooperate with other water quality management agencies

The principle nonpoint source control program to be employed under this program is the aquifer protection permitting program. It specifically provides for the use of BMPs for agricultural activities.

Remediation projects could include nonpoint source control programs, but none have been proposed at this time.

## **Enforcement Mechanisms**

The Department of Water Resources is empowered with an elaborate monitoring enforcement program to ensure that the objectives are reached. The agency plans to use public information and education as the primary vehicle through which to secure enforcement of the Groundwater Code. However, the agency is also empowered to levy civil and criminal penalties to ensure the program is implemented.

## **Monitoring System**

The Groundwater Code allows the AMA to enter the property where water withdrawal or transportation facilities are located, and where the use of groundwater is located.

The AMA can then inspect facilities, obtain data or access records, and determine compliance with codes and regulations.

### **Representative Projects**

The major programs designed within the project include: the groundwater quality assessment and management program, the agricultural conservation program, the municipal conservation program, the industrial conservation program, and the augmentation and reuse program.

### **Grassroots Involvement**

The plan was developed with the participation of four technical advisory committees addressing agriculture, augmentation and water quality, municipal and industrial, and turf (lawn and landscaping uses).

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

None directly noted.

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## **Sources**

### **Key Enabling and Governance Documents**

Arizona Groundwater Code

### **Watershed Management Documents**

Second Management Plan, 1990-2000, Phoenix Active Management Area. Arizona Department of Water Resources. March 1991. (See also similar plans for the Prescott, Pinal, and Tucson Active Management Areas).

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## South Florida Water Management District

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### Agency

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**Agency:**

South Florida Water Management  
District

**Telephone:**

(407)-686-8800

**Address:**

P.O. Box 24680

**Fax Telephone:****City-ST-Zip:**

West Palm Beach, Florida 33416-4680

**Contact Person:**

David Thatcher (407) 687-6330

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### Notes:

State law requires cities and counties in Florida to submit comprehensive plans to the state for approval. These plans must include programs to address infrastructure needs and environmental issues.

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### Year and Method of Establishment

Established 1972 as a result of the Florida Water Resources Act.

### Mission Statement/Strategic Focus

"Manage water and related resources for the benefit of the public and in keeping with the needs of the region." The key elements of their mission include: environmental protection and enhancement, water supply, flood protection, and water quality protection. The mission is accomplished through planning and research, operations and maintenance, community and government relations, land management, regulation, and construction. Also included in the mission statement is the responsibility to assist both public and governmental officials with the protection of water resources.

### Geographic Scale

The total area covered by the region is 17,930 square miles and encompasses the entire South Florida peninsula from Orlando to the Florida Keys. There are two basins located within the district—Big Cypress and Okeechobee—within all or part of sixteen counties.

## **Mechanism for Intergovernmental Coordination**

The district is managed by a Governing Board composed of nine members appointed by the Governor—four specific counties within the District and five appointed at-large. The Governing Board appoints the agency's Executive Director and the Director of the Office of Internal Audit. The District has a Local Government Assistance Program designed to form and maintain partnerships with local governments so that their views may be implemented into the District plan. The District works closely with local governments as they update their comprehensive plans enabling the District to share its goals for the future as well as expertise and water resource data.

## **Sources of Funding and Budget Information**

The district is a special taxing district with the budget of the district being funded through various sources. Taxes are levied in each of the two basins and then added to the overall tax of the District.

The budget for Fiscal Year 1993 is \$213.5 million. This includes \$160,738,435 in tax revenues and \$17,564,922 from intergovernmental funds.

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## **Management**

### **Management Structure**

The District works in eight different program areas. These program areas are: water resource management planning; regulation; acquisition and development of lands and facilities; implementation through external entities; operation and maintenance of water management land tracts; hydrologic, hydrogeologic, and environmental support services; and administration and indirect support services.

### **Degree of Authority**

Establishment of a number of regulatory programs. Permits are needed to construct water wells; take water from lakes, canals, streams, and the ground; construct and operate surface water management systems; and use district canal and levee right-of-way or other District lands. Permits for the management and storage of surface water require more of a variety of BMPs to address water quality and the maintenance of pre-development discharge rates for stormwater runoff.

### **Management Techniques**

This section will highlight only the nonpoint source pollution control techniques employed by the District. Techniques employed by the District include:



**Land acquisition.** The District has acquired 21,000 acres to protect the Everglades, Big Cypress, the Kissimmee River, and Lake Okeechobee values over the past twenty years toward an ultimate goal of 68,000 acres.

**Florida Department of Environmental Regulation Dairy Rule.** The Dairy Rule is designed specifically to reduce phosphorus inflows to Lake Okeechobee and the Everglades. Enacted in 1987, it requires that phosphorus inflows be reduced by 40% in Lake Okeechobee and 25% in the Everglades by requiring the use of BMPs by dairy operators in the basin. Specifically targeted are high intensity use areas such as feedlots, milking barns, holding pens, milk herd pastures with a vegetative cover of 80% or less. The rule requires that animal or other high-nutrient waste be collected stored and distributed over the farm by spray irrigation. Forty-nine farms are targeted, 30 of which are installing the systems.

The BMPs are those described in the USDA Soil Conservation Service Technical Office Guide. BMP practices employed include fencing cattle away from watercourses; collection, storage, containment and treatment of manure and wastewater runoff from high intensity areas; crop spray irrigation and land application of wastewater, solids and sludge; and buffer zones along watercourses and drinking water supplies.

The State Department of Agriculture and Consumer Services provided funding for cost-sharing the installation of BMPs. Additionally, a dairy buy-out program was instituted for farmers unwilling or unable to comply with the Dairy Rule. Eighteen farms participate in the program. The program pays dairies the dollar amount required to construct BMPs to stop milk production, then the District adds additional funds to relocate the cows and place a deed restriction on the property prohibiting future use as a dairy or concentrated animal feeding operation. This has cost a combined \$8.45 million for the relocation of just over 14,000 cows. One other farm was purchased as part of the Save Our Rivers program.

**Works of the District Regulatory Program.** Working in tandem with the Dairy Rule, the Works of the District permit is also designed to reduce phosphorus loads from non-dairy land operations. This requires land operators undertaking specific uses to apply for a permit, be subject to water quality monitoring to track phosphorus-laden runoff, and install remedial BMPs if the monitoring indicates that there is a 50% probability that discharge reduction objectives will not be met. Nearly 500 such permits have been issued. The uses for which general permits are required are: urban stormwater, golf courses, sugar cane, horse farms, nurseries, land spreading of sludge, and sod farms. Individual permits are required for dairies not covered by the Dairy Rule, improved pasture, vegetable farms and row crops, heifer farms, hog farms, poultry farms, and goat farms.

**The Use of BMPs in the Everglades Agricultural Area.** The SWIM plan for the Everglades concentrates on lowering phosphorus levels from point and nonpoint

sources in the District. Studies indicate that phosphorus levels could be reduced by employing the appropriate BMPs listed below:

- Calibrated soil test recommendations could reduce P from 0-25%. This procedure reduces the potential for overfertilizing.
- Banding fertilizer for vegetable production instead of broadcasting it could reduce P discharges from 10-40 percent and application rates of 50 percent.
- Preventing fertilizer spills and the spreading of fertilizer into drainage ditches could reduce P discharges by 0-15 percent.
- Minimizing water table fluctuations by not overdraining in vegetable and sugar cane fields could reduce P losses by 0-50 percent.
- Applicable only to sugar cane production, retention of on-farm drainage could reduce P losses from 15-60 percent by keeping water continuously moving from field to field.
- Retention of vegetables field drainage water in sugar cane or fallow lands could reduce P losses from 20-90 percent from any particular farm.
- Aquatic cover crop for off-season vegetable production and fallow rotation of sugar cane could reduce P losses from 5-20 percent. A crop such as rice will uptake a portion of the excess phosphorus that becomes readily available during any fallow flooding operation.
- On-farm retention ponds used to store excess rainfall for later use as irrigation water could reduce P losses from 10-60 percent.

**Stormwater Treatment Areas.** Stormwater treatment areas are large-scale constructed wetlands designed to trap and absorb pollutant loads in stormwater runoff in agricultural drainage canals. They succeed through the employment of intensive management of the wetland.

### **Enforcement Mechanisms and Schedule**

The District is empowered to issue permits, violation of which may result in fines or additional court actions.

### **Monitoring System**

The division of the District responsible for permit enforcement monitors activity in the watershed via aerial fly-overs every 1-2 weeks. The program also uses satellite imagery to monitor land use and other changes in the environment.

1989-1990 the District developed a ten year strategic plan designed to be crucial to agency planning projects and the annual budget process.

**Representative Projects**

Projects currently being worked on by the District include: Everglades restoration and Surface Water Improvement and Management Plan (SWIM) program, Kissimmee River restoration, the Lake Okeechobee SWIM program, and the "Save Our Rivers" program. Each of these projects contain smaller efforts within them.

**Grassroots Involvement**

Actively seek public participation.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

No financial assistance from US EPA.

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**Sources****Key Enabling and Governance Documents**

Florida Statutes, Chapter 373.

**Watershed Management Documents**

Draft Indian River Lagoon Surface Water Improvement and Management Plan. South Florida Water Management District and St. Johns River Water Management District. September 1992. Also contains Appendices A-H.

Biscayne Bay Surface Water Improvement and Management Plan. South Florida Water Management District. April 1989. Also contains Appendices A-K.

The Everglades: Surface Water Improvement and Management Plan. South Florida Water Management District. March 1992. Also contains Supporting Information Document and Appendices A-G.

Draft Lake Okeechobee Surface Water Improvement and Management Plan Update. South Florida Water Management District. October 1992. Also contains Appendices A-H.

## **Part IV.**

### **Profiles of Individual River or Watershed Programs**

- H Anacostia River—MD and DC
- H Barnegat Bay Estuary Program—NJ
- H Black Earth Creek Priority Watershed Project—WI
- H Grande Ronde Critical Basin Project—OR
- H Guadalupe-Blanco River Authority—TX
- H Menomonee River Priority Watershed Project—WI
- H Middle Fork River—WV
- H Milwaukee River Priority Watershed Project—WI
- H Mississippi Headwaters Board—MN—Upper Mississippi River (Above St. Paul)
- H Nisqually River Council—WA
- H Lower East Branch Pecatonica River Priority Watershed Project—WI
- H Puget Sound Water Quality Authority—WA
- H Suwannee River Water Management District—FL
- H Sweetwater Authority—CA
- H Tualatin River Critical Basin Project—OR
- H Upper Delaware Scenic and Recreational River—NY and PA
- H Watershed Committee of the Ozarks—MO

## Anacostia Watershed Restoration Committee

### Agency

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**Agency:**

Metropolitan Washington Council of  
Governments

**Telephone:**

(202) 962-3343

**Address:**

777 North Capitol Street

**Fax Telephone:**

(202) 962-3203

**City-ST-Zip:**

Washington, DC 20002-4226

**Contact Person:**

Jim Shell, Chief  
Anacostia Restoration Team

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**Notes:**

The Anacostia Watershed Restoration Committee serves as the basin-wide coordinator for the program to restore the highly urbanized Anacostia watershed.

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### Year and Method of Establishment

In 1987 the District of Columbia, the State of Maryland, Montgomery County, and Prince George's County signed into effect the Anacostia Watershed Restoration Agreement. The Agreement formalized a cooperative partnership to restore the Anacostia River and tributaries and utilized all resources to achieve this goal. To guide the restoration process, the Agreement called for the establishment of the AWRC to develop a restoration plan and coordinate the efforts of the local, state, and federal agencies.

### Mission Statement/Strategic Focus

The main goals of this agreement are: to improve the water quality of the region; to protect the ecology and wildlife of the river; manage erosion, sediment, and pollution; maintain part of the waterway as navigable; expand the opportunities for the public use of the area for recreational purposes; and to enhance public participation and awareness.

## **Geographic Scale**

The drainage area encompasses 179 square miles. Two physiographic areas comprise the region, the Piedmont Plateau and the Coastal Plain. The sub-basins of the region include: Sligo Creek, Northwest Branch, Paint Branch, Little Paint Branch, Indian Creek, Beaverdam Creek, Northeast Branch, Lower Beaverdam Creek, and the Tidal Anacostia. The watershed is highly urbanized.

## **Mechanism for Intergovernmental Coordination**

The AWRC is involved with policy issues related to the goal of improving water quality and protecting aquatic habitat within the Anacostia River and its tributaries. In addition, the Committee is charged with enacting the goals of the Six-Point Action Plan to restore the Anacostia River. The six goals are:

- GOAL #1     Dramatically reduce pollutant loads delivered to the tidal estuary to improve water quality conditions by the turn of the century.
- GOAL #2     Protect and restore the ecological integrity of urban Anacostia streams to enhance aquatic diversity and provide for a quality urban fishery.
- GOAL #3     Restore the spawning range of anadromous fish to historical limits.
- GOAL #4     Increase the natural filtering capacity of the watershed by sharply increasing the acreage and quality of tidal and non-tidal wetlands.
- GOAL #5     Expand forest cover throughout the watershed and create a contiguous corridor of forest along the margins of its streams and rivers.
- GOAL #6     Make the public aware of its key role in the cleanup of the river, and increase volunteer participation in watershed restoration activities.

## **Sources of Funding and Budget Information**

Congressional appropriation, Sec. 106 of Clean Water Act, funding for Maryland and Washington, DC.

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## **Management**

### **Management Structure**

Under the Anacostia Watershed Restoration Committee, there are other committees established. These committees include: the Reforestation Work Group (RWG) which provides the technical assistance on and coordinates the activities of waterway reforestation; the Small Habitat Improvement Work Group (SHIP) which seeks to design low cost, small-scale projects implemented by citizen/environmental groups concerning the restoration of habitats; and the Anacostia Monitoring Subcommittee which monitors progress made in achieving non-point source pollution reduction goals.

### **Degree of Authority**

The AWRC is not a regulatory agency in itself, but its members, being other local, state, and federal government agencies, have considerable regulatory authority over the river system, and the Committee acts as a successful coordinating body.

### **Management Techniques**

The Committee uses the existing authorities of its members to carry out the plan. Much of the management is a series of over 440 restoration projects, including wetlands creation, stream restoration, sewer and stormwater management, fishery enhancement projects, riparian reforestation, and public participation projects.

### **Enforcement Mechanisms**

The members of the Committee use their existing authorities to secure enforcement of the program. However, the program is oriented decidedly more toward restoration and improvement projects than toward enforcement actions.

### **Monitoring System**

The watershed area is monitored by the coordinated Anacostia Monitoring Subcommittee (CAMP). The Metropolitan Council of Governments (COG) assumes the responsibility for the coordination of activities involved with the sampling processes of the various agencies involved, and maintains a computerized data base. The agencies that participate in the sampling activities are: the Maryland Department of the Environment, D.C. Environmental Control Division, Maryland National Capital Parks and Planning Commission, Montgomery County Department of Environmental Protection, and the Prince George's County Health Department.

Long term monitoring programs are also developed for each of nine priority sub-watersheds.

### Representative Projects: Summary of Anacostia Restoration Blueprint

Note: This list is preliminary and is subject to change based on AWRC review.

*Stormwater Retrofits Projects: includes the creation of new best management practices or modifications of existing ponds or BMP's to improve the quality of urban runoff.*

total number of projects	159
total area controlled	approximately 35 square miles
projects in-progress or completed to date	45 (28%)
estimated capital cost	\$27.6 million

*Stream Restoration Projects: includes bioengineering and other measures that stabilize eroding stream banks and create better fish habitat.*

total number of projects <sup>2</sup>	60
total project length	approximately 20 stream miles
projects in-progress or completed to date	8 (13%)
projected capital cost <sup>1</sup>	\$8.0 million

*Fish Passage Projects: includes projects to eliminate barriers to anadromous and resident fish migration.*

total number of projects	31
projects in-progress or completed to date	6 (20%)
projected capital cost <sup>1</sup>	\$1.1 million

*Riparian Reforestation: includes the reestablishment of forest habitats within 300 feet of the Anacostia and its tributaries.*

total number of projects <sup>2</sup>	68
total project length	approximately 15 stream miles
projects in-progress or completed to date	25 (37%)
projected capital cost <sup>1</sup>	\$800,000

*Wetland Creation: includes the creation of emergent wetlands in both tidal and non-tidal areas.*

total number of projects <sup>2</sup>	34
area	one square mile
projects in-progress or completed to date	10 (30%)
projected capital cost <sup>1</sup>	\$7.3 million

*Small Habitat Improvement Program (SHIP): includes small scale restoration projects (excluding reforestation) suitable for implementation by citizens. These projects include stormdrain stenciling, stream cleanups, wildflower plantings, etc.*

total number of projects	400
projects in planning	72 (18%)
projects completed	12
projected capital cost <sup>1</sup>	\$800,000



*Other Restoration Projects: includes CSO abatement, river dredging, sewer rehabilitation, reclamation and other activities that contribute to the restoration of the river.*

total number of projects	17
projects in-progress or completed to date	3 (25%)
projected capital cost <sup>1</sup>	\$70 million

- Notes:
1. Cost projections do not include costs for project planning, design, permitting, maintenance, and land acquisition (if any). Projections are based on 1990 dollars, and therefore will increase gradually over the next decade.
  2. The total number of restoration projects in this category may increase as further field surveys are performed.
  3. Does not include wetland acreage created by stormwater retrofit projects, which is significant.

### Grassroots Involvement

The public participation program involved with the Anacostia River began in the spring of 1988. This program is said to be highly active and involves a large number of participants. The program includes a newsletter, *In the Anacostia Watershed*, a coordinator for each of the nine priority sub-basins, and a wide variety of other educational activities.

### Assistance Provided by US EPA; Assessment of Value of the Assistance

Financial - very valuable, help to educate citizens regarding what is being done to preserve water quality. There is also a connection to EPA through the Chesapeake Bay Program.

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## Sources

### Key Enabling and Governance Documents

1987 Anacostia Watershed Restoration Agreements

## **Watershed Management Documents**

Under direction of the AWRC, MWCOG staff have developed a Six-Point Action Plan to restore the Anacostia River; a document that identifies six broad goals and a strategy for restoring the watershed. In addition, the AWRC directed MWCOG staff to prepare a blueprint of planned restoration activities that will be needed to implement the goals of the Six-Point Action Plan.

There are periodic "State of the Anacostia" status reports issued by the Committee through the Council of Governments with the ICPRB. Sub-watershed action plans, known as SWAPs, are being developed for the nine priority sub-watersheds.

## Barnegat Bay Watershed Plan

### Agency

**Agency:**

New Jersey Dept. of Environmental  
Protection and Energy

Office of Land and Water Planning

**Address:****Telephone:**

(609) 984-0058 or (609) 292-2113

**Fax Telephone:**

(609) 984-2147

**City-ST-Zip:**

Trenton, NJ

**Contact Person:**

Theresa Fowler PP, AICP

**Notes:**

Water Quality in the Bay is currently being degraded by nonpoint sources of pollution, especially those sources involved with land use development. This is a new plan without special funding. Therefore, project sponsors it will be indicated in stages.

### Year and Method of Establishment

The New Jersey State Legislature's enactment of P.L. 1987, Chapter 397 mandated a study of the Bay and the effects of growth and development upon it.

The Association is still in its formative stage.

### Mission Statement/Strategic Focus

The Watershed Management Plan for Barnegat Bay is divided into seven chapters, each with its own set of action plans. These chapters are: Watershed Management, Sensitive Area Protection, Water Area and Use, Fisheries Management, Public Access, Public Participation and Education, and Research and Monitoring.

Each action plan consists of several action items. Each action item includes a management objective; the rationale for most objectives; the lead agency responsible for overseeing the action item; cooperating parties; possible secondary sources; and required legislation or policy changes.

The objectives for watershed management include: to encourage planning and regulatory agencies to promote land use that will protect and preserve the natural environment; to improve water quality of the Bay, primarily through the decrease in nonpoint sources, to the extent where biotic and recreational potentials are reached; to

promote development which minimizes the increase in storm water run-off and associated pollution; to maintain open shoreline; and to recommend and promote development strategies that minimize the impact to natural habitat and maintains wildlife corridors. The objectives for watershed protection include: to maintain and improve the overall water quality of the Bay through land use methods sensitive to the natural environment; to protect and enhance the overall quality of natural habitats near the shore or in estuarine environments critical to maintaining a balanced ecosystem; and to maintain and improve the quality and diversity of native flora, fauna, and biological communities. The objectives for water area and use include: to reduce erosion of natural shorelines and wetlands due to wake of watercraft; the restriction of vessels in the proximity of near shore critical habitats, to regulate waterfront to reduce safety hazards of waterfront property, to minimize the conflict between watercraft by identifying areas suitable for special uses, encouraging those uses in specified areas and to establish special speeds in hazardous areas; to improve adherence to Boat Operation Regulation; to minimize the conflict between watercraft and fishing equipment; to permit or expand facilities only in environmentally suitable areas; to minimize the need for structural shore protection of natural shorelines; to maintain navigation channels that facilitate recreational uses and cause minimal impact to the environment; and to manage the existing and proposed boating facilities to have little impact upon the environment. The proposed plan also includes management suggestions for fisheries, and the objectives listed include: to reduce user conflicts relevant to the Blue Crab; to enact regulations concerning the Blue Crab fishery in order to protect resources of the Barnegat Bay; to obtain additional information and amend regulation concerning winter flounder populations; and to obtain information and amend regulations concerning the American eel fisheries. The Public Access section of the Watershed Plan proposes a series of public and private actions to maintain, enhance, and protect physical and visual access to the Barnegat Bay waterfront. The Public Participation and Education objective of the plan is to encourage the implementation of the management plan and to support environmental education that promotes and encourages an environmental ethic in the citizens of the Bay area emphasizing their connection to and impact on the health and welfare of the region. The objectives for Research and Monitoring include: the establishment of an integrated program of data collection, analysis, synthesis, and interpretation that will enhance baseline information; characterize spatial and temporal trends of conditions in the Bay and the human factors affecting those conditions; to establish and maintain a system of priorities, funding , and dissemination of research that will aid in the knowledge of the Bay and its systems.

### **Geographic Scale**

The Barnegat Bay watershed lies within the coastal plain of New Jersey, and is a 75 square mile ecosystem. The Bay drains from an area of approximately 450 square miles. The watershed area consists of four different sub-areas: the barrier islands; the northeast mainland area; the southeast mainland area, in which environmentally sensitive areas such as the Barnegat National Wildlife Refuge and the Manahawkin

Fish and Wildlife Management areas are located; and the western side of the watershed protected by the Pinelands Comprehensive Management Plan.

### **Mechanism for Intergovernmental Coordination**

The plan creates no new coordinating or planning agency. The only mechanism for intergovernmental coordination is the plan itself, which lists specific action items and the lead and cooperating agencies relevant to implement each item. The plan has been endorsed by the lead and cooperating agencies involved. Because most of the watershed is located within Ocean County, much of the responsibility for implementing the plan fall on that county, and it has the job of overseeing plan implementation. The role of the state is to provide technical assistance and funding to local governments.

### **Sources of Funding and Budget Information**

The plan assigns responsibilities but it provides no funding. Rather, it lists funding sources to implement each action item, usually recommending the state as the funder. Not surprisingly, the plan is being implemented in stages.

There is no budget for implementing the plan. Rather, the plan recommends that agencies seek additional appropriations to implement those parts of the plan for which each is responsible.

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## **Management**

### **Organizational Management**

The plan provides for coordinated implementation without benefit of a new central body responsible for oversight. The authority of the plan lies in the endorsements and sign-offs it has received from potential participators. The Watershed Management Plan recommends that participating agencies make specific policy or legislative changes to implement various aspects of the plan.

### **Management Techniques**

The primary emphasis is on strengthening existing plans and ordinances. The management plan endorses but does not mandate other tools such as cluster zoning, transfers of development credits, property donation, regional tax base sharing, development allocation, performance zoning, and others. The plan also suggests that designation as a component of the National Estuary Program would be beneficial.

The plan proposes the following elements to control nonpoint source pollution:

- Municipalities should adopt stormwater management plans and ordinances
- Conduct demonstration projects to encourage and test BMPs, that are innovative, low-cost, and long-term
- Alter flood control systems to also serve stormwater management needs
- Conduct training programs on nonpoint source control for municipal and county employees
- Install native species landscaping to demonstrate water conservation, pesticides reduction and fertilizer reduction on public lands and common open spaces
- Amend municipal construction codes to include provisions for water quality improvement including requiring grass swales in place of roadway curbs
- Enact soil erosion and sediment control ordinances to reduce sedimentation
- Empower Ocean County to review programs with regional impact such as drainage, roadways, and similar projects in order to control cumulative impacts
- Develop a coastal nonpoint pollution control program as stipulated by the NJ Coastal Zone Reauthorization amendments of 1990
- NJ DEPE should initiate monitoring program to identify areas in Barnegat Bay that have exceeded water quality standards.
- Provide for cluster zoning to reduce impervious surfaces and provide buffers to sensitive areas
- Establish minimum buffers adjacent to coastal wetlands
- Create critical zones no less than 150 feet in width along the Bay and other water bodies and storm sewer inlets
- Establish incentives program, such as conservation easements and re-evaluation of real property, to entice property owners and real estate developers to create buffer areas consisting of indigenous vegetation to protect wetlands and surface waters

### **Enforcement Mechanisms**

Enforcement is up to the individual agencies that are implementing their aspects of the plan. Interestingly, the plan endorses the creation of a "baykeeper" citizens watchdog position.

### **Monitoring System**

The plan recommends that the NJ Department of Environmental Protection and Energy establish a system to monitor the bay's resources.

**Representative Projects**

The plan recommends several specific enhancement projects related to stormwater management, point source infrastructure, and public access.

**Grassroots Involvement**

The plan recommends that "residents of the watershed", "members of the watershed association", and the "baykeeper" be involved in implementing specific tasks in the action program.

Additionally, the plan proposes a multi-faceted information program to educate the public about the Bay program.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

The US EPA is listed as a participating agency in many of the action recommendations. The program is beginning to get underway, so there is no way to assess the value of assistance.

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**Sources****Key Enabling and Governance Documents**

No enabling documents. No formal authorization has been issued.

**Watershed Management Documents**

A Watershed Management Program for the Barnegat Bay (Draft). New Jersey Department of Environmental Protection and Energy. Volumes I and II. August 1992.

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**Black Earth Creek Priority Watershed, WI**

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**Agency:**

Wisconsin Dept. of Natural Resources  
Nonpoint Source and Land Mgmt.  
Section

Bureau of Water Resources Mgmt.

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**Notes:**

This appendix includes a separate profile on the Wisconsin Nonpoint Source Water Pollution Abatement Program.

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**Year and Method of Establishment**

The Black Earth Creek Priority Watershed plan was prepared under the provisions of the Wisconsin Nonpoint Source Water Pollution Abatement Program, initiated in 1984 under Chapter NR 120, Wisconsin Administrative Code.

**Mission Statement/Strategic Focus**

The management plan sets forth several goals:

- A 50 percent reduction in the sediment from croplands, construction sites and other sources of sediment
- A 50 percent reduction in the manure entering the stream
- Habitat restoration in selected stream segments

**Geographic Scale**

The Black Earth Creek Watershed is located primarily in Dane County, Wisconsin. Approximately 100 square miles in size, it flows to Blue Mounds Creek, a tributary of the Wisconsin River, a tributary of the Mississippi River. Land use in the watershed is 56 percent agricultural and 32 percent forested.



## Mechanism for Intergovernmental Coordination

The management plan is a cooperative, coordinated system administered by the Department of Natural Resources. Dane County, through its Land Conservation Committee, participates in the planning process via resolution of the County Board of Supervisors. The county entered into an agreement with DNR for the purpose of receiving funds for management, enforcement, and cost-sharing with private property owners and land operators.

## Sources of Funding and Budget Information

The state program provides cost-share funds to assist in implementing the nonpoint program. Projects may be funded up to five years after the watershed plan is approved by DNR. Funding does not cover some costs such as land acquisition or the renovation or construction of new storm sewer systems needed to comply with this program or other state or federal laws.

The state program provides for cost-sharing agreements to be entered into between the participating counties and landowners or land operators. If landowners fail to participate voluntarily, the offer of the cost-sharing arrangement may be revoked and a low-interest loan arrangement may be substituted.

The state cost-share rates for Best Management Practices are as follows:

Best Management Practice	Flat Cost-Share Rate
Contour Farming.....	\$6.00/ac.
Strip Cropping.....	\$12.00/ac.
Field Strip Cropping.....	\$10.00/ac.
Reduced Tillage.....	\$15.00/ac. 1
Reduced Tillage.....	\$45.00/ac. 2

1. Reduced tillage systems for short crop rotations, and establishment of forages and small grains (Includes no-till).
2. Reduced tillage systems for continuous row cropping or long rotations (does not include no-till).

Best Management Practice	State Cost-Share Rate	
<u>Rural BMPs</u>		
Contour Farming.....	50%	*
Contour Strip Farming .....	50%	*
Field Strip Cropping.....	50%	*
Field Diversions and Terraces.....	70%	
Grassed Waterways .....	70%	
Reduced Tillage.....	50%	
Critical Area Stabilization .....	70%	1
Grade Stabilization Structures.....	70%	
Agricultural Sediment Basins.....	70%	
Shoreline and Streambank Stabilization.....	70%	
Shoreline Buffers .....	70%	1
Barnyard Runoff Management.....	70%	
Animal Lot Relocation.....	70%	
Manure Storage Facilities.....	70%	**
Livestock Exclusion from Woodlots .....	50%	
Wetland Restoration.....	70%	1
Roofs for Barnyard Runoff Management & Manure Storage Facilities .....	70%	
Nutrient and Pesticide Management.....	50%	2
<u>Urban BMPs</u>		
Critical Area Stabilization .....	70%	3
Grade Stabilization Structures.....	70%	
Shoreline and Streambank Stabilization.....	70%	
Shoreline Buffers .....	70%	3
Wetland Restoration.....	70%	3
Structural Urban Practices.....	70%	4
Street Sweeping .....	50%	5

1. Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs.
2. Spill control basins have a cost-share rate of 70 percent.
- \* Wildlife habitat restoration components of this practice are cost-shared at 70 percent.
- \*\* Maximum cost-share amount is \$10,000 including no more than \$5,000 for manure transfer equipment.
3. Easements may be used in conjunction with these practices.
4. Applies only to structures for established urban areas. Established urban surfaces are considered to be those in existence prior to the date the DNR approves the watershed plan.
5. This is an alternative best management practice not listed in NR 120 of the Wisconsin Administrative Code.

The projected total budget for the rural portion of the watershed plan includes capital costs, easements, local government costs, information and education, and other direct costs. The table specifies the state share versus the local share.

**Black Earth Creek Priority Watershed Plan**  
**Projected Budget (8 Years) for Rural Operations**  
*(Assumes 100% Participation by Landowners and Land Operators)*

<b>Cost Center</b>	<b>Dane Co.</b>
BMP Capital Costs	\$ 1,165,250
Easement Costs	_____
Staff Needs	225,000
Information Education/Direct	8,000
Other Direct	15,000
Total State Share	\$ 1,398,250
Local Share	328,714
Total Budgeted Cost	\$ 2,726,964

The urban segment of the program provides services to thirteen municipalities including the City of Milwaukee. Cost-sharing will not cover the cost of land acquisition or the renovation or construction of storm sewer systems. Cost-sharing is available for the following actions in addition to the listing of eligible BMPs above:

## Black Earth Creek Priority Watershed Plan Urban Strategies Eligible for Funding

Urban Strategy	Flat Cost-Share Rate
Development of Construction Erosion Control Ordinances .....	100%
Development of Stormwater Management Ordinances .....	100%
Engineering Studies for Existing Urban Areas; Studies for Planned Urban Areas .....	100% 1.
Design and Engineering for Structural BMPs .....	100%
Local Enforcement Staff.....	100% 2
Staff for Accelerated Street Sweeping.....	100% 2
Development of alternative financing and admin. strategies .....	100%

1. Funding not available for components dealing exclusively with drainage and flooding.
2. Funding limited to five years. Level of staffing based on a work plan submitted by local units of government and approved by the DNR.

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## Management

### Organizational Structure

The plan is carried out under a joint plan approved by the Wisconsin Department of Natural Resources, the Department of Agriculture, Trade and Consumer Programs, and the Dane County Land Conservation Department. Also participating are the Soil Conservation Service and the Agricultural Stabilization and Conservation Service. The University of Wisconsin Extension provides support in developing and conducting a public information and education program aimed at increasing voluntary participation in the project. Three villages—Cross Plains, Middleton, and Manzanie—participate in the urban program.

### Types of Authority

Landowners, land operators, villages, cities, counties, and state agencies all have a hand in implementing this program. Their *major* responsibilities are as follows:

***Landowners and Land Operators:*** Adopt Rural Best Management Practices which reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources.

For the urban program, private landowners in certain circumstances will install BMPs on their property.

**Villages:** For the rural program, enact a manure storage ordinance meeting the provisions outlined by the Department of Agriculture, Trade and Consumer Protection in Ag 166.98. The intent of this ordinance is to prevent pollution of groundwater by poorly designed and constructed animal waste storage facilities.

For the urban program, there are two parts to the program, a set of core programs and segmented programs (those projects requiring site specific investigations prior to implementation). The core tasks are to:

- Enact an adequate construction erosion ordinance
- Develop and implement a community specific program of urban housekeeping practices that reduce urban nonpoint source pollution
- Implement the information and education strategy

The segmented program tasks are to:

- Identify high priority segments the community wishes to pursue in existing and planned urban areas, including an evaluation of source reduction and financing
- Conduct engineering feasibility and site location studies for high priority areas
- Adopt, administer, and enforce a comprehensive stormwater management ordinance
- Enter into cost-share agreements for eligible BMPs
- Conduct detailed alternative financing/implementation studies which determine the means to pay for administering nonpoint source control program in each municipality

### ***Dane County***

- Develop farm conservation plans consistent with the needs of the project
- Enter into nonpoint source cost-share agreements with eligible landowners and enforce the terms and provisions of the agreements and management their reimbursement
- For county-owned and operated lands, enter into cost-share agreements with the DNR to correct identified nonpoint sources and fulfill their obligations as cost-share recipients
- Design best management practices and verify proper practice installation
- Prepare and submit annual work plans and an annual work load analysis and grant application to the Department of Agriculture, Trade and Consumer Protection
- Prepare and submit annual resource management reports to monitor implementation by tracking changes in the nonpoint source inventory and quantifying pollutant load reductions which result from installing BMPs.

- Conduct the information and education activities identified in the plan for which they are responsible

**Department of Natural Resources:** DNR responsibilities include project administration, financial support via local assistance grant agreements and nonpoint source grant agreements; project evaluation; technical assistance; assisting county staff with site reviews of projects affecting wetlands or groundwater; and assisting county staff with the integration of fish and wildlife management concerns into the BMPs.

**Department of Agriculture, Trade and Consumer Protection:** The DATCP role is identified in s. 144.25, stats, ch. 92 stats; and NR 120. The major responsibilities are: manage a training program for the staff involved in implementation; act as a clearinghouse for information related to agricultural BMPs, sustainable agriculture and nutrient and pest management; assist in carrying out the information and education programs, assist in identifying watershed participants subject to federal or state conservation compliance programs; assist counties in developing manure storage ordinances; assist in developing technical standards for agricultural BMPs; and assist in evaluating the site specific practicality of implementing rural BMPs.

## Management Techniques

This is a management plan for the abatement of rural nonpoint source pollution. The Best Management Practices employed generally use specific standard specifications included in the Soil Conservation Service Field Office Technical Guide. Additional specifications may apply. The techniques used in this plan include:

Contour Farming	Grade Stabilization Structures
Contour Strip Cropping	Agricultural Sediment Basins
Field Strip Cropping	Shoreline and Streambank Stabilization
Field Diversions and Terraces	Shoreline Buffers
Grassed Waterways	Barnyard Runoff Management
Reduced Tillage	Animal Lot Relocation
Critical Area Stabilization	Manure Storage Facilities
Livestock Exclusion from Woodlots	Wetland Restoration
Roofs for Barnyard Runoff Management & Manure Storage Facilities	Nutrient and Pesticide Management

## Enforcement Mechanisms

Wisconsin DNR has the power to review and approve local plans, including all aspects of administration and management. Stormwater management plans must be consistent with the state model ordinance and must meet pollutant reduction goals. Individual BMPs are controlled via contract. Landowners or operators required to participate but who do not lose the cost-share arrangement in favor of a low-interest loan program.

## **Monitoring System**

The plan includes a regimen for monitoring both administrative and pollutant load management systems. Wisconsin DNR is primarily responsible for administrative and pollutant load tracking. It uses the WIN (Wisconsin Nonpoint) System for monitoring the reduction of sediment, and the Wisconsin Modified ARS model to evaluate the reduction of manure from barnyards. The Dane County Land Conservation Department uses its GIS system to monitor reductions in pollutant and sediment loads throughout the watershed.

## **How Long Has the Plan of Management Been in Force?**

The management plan was prepared and approved in March 1989. It was added as an amendment to the regional water quality management plan for the Lower Wisconsin River Basin and as part of the area management plan for Dane County.

## **Representative Projects**

The Black Earth Creek Watershed is divided into seventeen sub-watersheds, each with its own management objectives. One of these is for the Headwaters to County Highway P area. It is divided into two segments. For the upper area, the plan lists three objectives:

- Prevent potential discharge of toxic substances into the stream
- Maintain integrity of recharge area of springs
- Reduce sediment and oxygen demanding substances to protect next stream segment downstream by 50%

The lower segment has these objectives:

- Maintain a Class I trout fishery in this stream by:
  - increasing dissolved oxygen levels
  - lowering high water temperatures
  - reducing sedimentation
  - decreasing organic loading to this stretch of stream
- Improve habitat to reduce macrophyte-caused dissolved oxygen sags and to reduce sedimentation
- Reduce sediment and oxygen demanding substances by 50% to protect next stream downstream segment.

## **Grassroots Involvement**

This plan has an extensive program built in for raising public awareness and providing public information. The program uses printed materials, audio-visual programs,

exhibits, media, tours, demonstrations, signs, workshops, meetings, and youth education. Sub-groups specifically targeted include rural landowners and operators, local governments, urban residents, business and industry, and youth. The program is tailored for each sub-group.

**Program benefits identified to date**

No data available.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

None identified.

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**Sources****Key Enabling and Governance Documents**

The enabling legislation is woven into the state administrative code.

**Watershed Management Documents**

*A Plan for the Control of Nonpoint Sources and Related Resource Management in the Black Earth Creek Priority Watershed Project.* Prepared cooperatively by the Wisconsin Department of Natural Resources; and the Department of Agriculture, Trade and Consumer Protection, in cooperation with the Dane County Land Conservation Department. March 1989. Publication WR-218-89.

*Nonpoint Source Evaluation Monitoring Activities.* Prepared by the Wisconsin Department of Natural Resources. March 1991. Publication WR-279-91.

*Fields and Streets*, the Newsletter for Wisconsin's Nonpoint Source Water Pollution Abatement Program. Wisconsin Department of Natural Resources.



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## Grande Ronde Critical Basin Project

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OR Dept. of Environmental Quality

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811 SW Sixth Avenue

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### Notes:

The program is less than two years old, and is just now moving beyond the monitoring/sampling stage.

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### Year and Method of Establishment

A 1987 consent decree issued by the U.S. District Court directed the state of Oregon to enforce water quality management programs for streams classified as water quality-limited under the Clean Water Act. The state was ordered by the judge to adopt two total maximum daily load (TMDL) plans per year. Thus far, fifteen rivers in Oregon have been designated as priority waterbodies under the Department of Environmental Quality's Critical Basin Program, among them the Grande Ronde in eastern Oregon. Monitoring work began in earnest on the Grande Ronde in 1991. The Critical Basin Program is Oregon's system for designating priority watersheds under EPA rules for nonpoint source management.

### Mission Statement/Strategic Focus

Samples indicate that the river exceeds allowable standards for pH, dissolved oxygen, fecal bacteria, phosphorus, nuisance algal growth, and temperature. The goal of the program is to restore the river to "high quality water" status, that is, to return the river to a condition that supports all beneficial uses. The project has five objectives:

1. Characterize water quality problems, pollution sources and factors that impact water quality in the basin
2. Establish water quality objectives or targets

3. Develop an implementation strategy and schedule, including responsible parties and designated management agencies, program plan schedules, permit amendments, compliance dates and a monitoring plan
4. Work with the public, potentially affected parties and local governments to develop an understanding of the project and the water quality objectives, and to foster effective implementation
5. Coordinate with other agencies conducting studies and projects in the basin to share information and accomplish the water quality, flow and habitat goals for the basin.

### **Geographic Scale**

The Grande Ronde River Basin covers 5,265 square miles in northeastern Oregon and southeastern Washington, of which 4,916 square miles are in Oregon. The main stem of Grande Ronde is about 210 miles in length. It flows into the Snake River, a tributary of the Columbia River.

### **Mechanism for Intergovernmental Coordination**

Many agencies have direct involvement with the waters of the Grande Ronde, including the Bureau of Reclamation, the US Forest Service, the US Soil Conservation Service, the Oregon Department of Environmental Quality, the Oregon Department of Fish and Wildlife, the Oregon Department of Water Resources, the Confederated Tribes of the Umatilla, and the Northwest Power Planning Council. The DEQ coordinates with each in work that protects water quality and promotes beneficial uses.

### **Sources of Funding and Budget Information**

State appropriations for the DEQ are the source of funds for the program.

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## **Management**

### **Organizational Structure**

Plans would be implemented under the leadership of the Department of Environmental Quality. The state's Strategic Water Management Group, a coordinating group empowered by the legislature, identified twenty-eight authorities in Oregon law and regulation that pertain, at least in part, to the management of nonpoint sources of water pollution. It would be expected that DEQ would coordinate the installation of BMPs with these agencies as appropriate.

## **Types of Authority**

The Grande Ronde is a river with which many different agencies have an active interest. DEQ has interest for water quality purposes, the Department of Water Resources tracks it as an Oregon State Scenic Waterway and as a stream restoration project. The USDA Forest Service is studying the river as a potential component of the National Wild and Scenic Rivers System. Several agencies have banded together on the Power Planning Council's Model Watershed program and also on the Upper Grande Ronde Anadromous Fish Habitat Restoration Program. Each of these programs is directly related to the protection of beneficial uses and the control of nonpoint sources.

## **Management Techniques**

Since the assessment phase is not yet complete, active management has not yet begun. The Department will establish TMDLs and load allocations in 1993 to address pH, dissolved oxygen, and algal growth. A plan to address temperature reduction will go into operation in 1994.

The Grande Ronde is also part of the Northwest Power Planning Council's Model Watershed Program. The Council sponsored a major regional hydropower study, focused particularly on the Columbia River basin, that also addressed other public uses and demands for river systems in the area. In particular, restoration of historical salmon migrations was identified as a high priority.

## **Enforcement Mechanisms**

This program operates under its existing authorities without separate authorization by the legislature. As such, those authorities each have established enforcement mechanisms to assure the program is carried out by the public.

## **Monitoring System**

An elaborate monitoring system is in place. Many agencies contribute to the monitoring activities, including the Bureau of Reclamation, the US Forest Service, the US Soil Conservation Service, the Oregon Department of Environmental Quality, the Oregon Department of Fish and Wildlife, the Oregon Department of Water Resources, the Confederated Tribes of the Umatilla, and the Northwest Power Planning Council.

## **How Long Has the Plan of Management Been in Force?**

Program will go into operation in mid-1993.

**Representative Projects**

No management plan in place yet.

**Grassroots Involvement**

The Critical Basin Program exists in part due to litigation by environmental organizations in the Northwest to force the states to improve their efforts to implement the provisions of the Clean Water Act.

**Program Benefits Identified to Date**

Program is still in the assessment stage. No benefits yet.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

No direct assistance sited.

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**Sources****Key Enabling and Governance Documents****Watershed Management Documents**

1988 Water Quality Status Assessment (305b) Report, Appendix T-C5, Grande Ronde River Total Maximum Daily Load Report. Oregon Department of Environmental Quality. 1988.

Grande Ronde Critical Basin Project Workplan. Oregon Department of Environmental Quality. June 5, 1991. Updated March 24, 1992.

## Guadalupe-Blanco River Authority of Texas

### Agency

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<u>Address:</u> P.O. Box 271 933 E. Court Street	<u>Fax Telephone:</u> (210) 379-9718
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Notes:

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### Year and Method of Establishment

The Guadalupe-Blanco River Authority (GBRA) was created in 1935 by an act of Texas Legislature.

### Mission Statement/Strategic Focus

The GBRA was established in order to develop, conserve, and protect the waters of the Guadalupe River Basin.

### Geographic Scale

The Authority covers ten—Kendall, Comal, Hays, Guadalupe, DeWitt, Caldwell, Gonzalez, Victoria, Refeigio, Calhoun counties, an area of about 7,000 square miles..

### Mechanism for Intergovernmental Coordination

GBRA is governed by a board of nine directors appointed by the Governor. Each member serves a six-year term with three directors appointed or reappointed every two years. Management and administrative functions are performed by the General Manager under practices that are established by the board.

## **Sources of Funding and Budget Information**

The GBRA cannot levy taxes or assessments. Revenues are from services including water supply, power generation, and provision of sewer and other services. GBRA operates on a fiscal year that runs from September 1st to August 31st. The budget is about \$13 million per year. There are 121 employees.

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## **Management**

### **Organizational Structure**

The GBRA is divided into eleven divisions that include: the General Guadalupe Valley Hydroelectric, Rural Utilities, Water Supply, Calhoun Canal, Port Lavaca Water Treatment Plant, Calhoun County Rural Water Supply, Victoria Regional Waste Disposal, Coleta Creek, Luling Water Treatment Plant, and Canyon Hydroelectric Division.

### **Degree of Authority**

The Authority is non-regulatory, although it has major responsibilities for the construction and operation of water projects.

### **Management Techniques**

The GBRA primarily operates water resources projects.

### **Enforcement Mechanisms**

It is not a regulatory authority. It has intervened in support of a lawsuit against a federal agency to protect water supplies.

### **Monitoring System**

There is monthly water quality testing and a fully equipped testing and research laboratory.

### **Representative Projects**

Coleta Creek - Constructing cooling pond reservoir. Canyon Hydroelectric Generator, sponsor of Canyon Reservoir construction, operate wastewater plant in Victoria; rural waste water treatment plants.

**Grassroots Involvement**

The GBRA sponsored a program entitled "Major Rivers" as a state-wide education program designed to introduce students to Texas River systems, water and wastewater treatment, conservation, and the preservation of natural resources. The GBRA has also developed its own educational program entitled Journey Through the Guadalupe Basin.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

None

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**Sources****Key Enabling and Governance Documents**

Enabling Act passed in 1935 by the Texas Legislature. Last revision was in 1975. Vernon's Civil Statutes, Article 8280-106.

**Watershed Management Documents**

Regional Water Plan for the Guadalupe River Basin. Guadalupe-Blanco River Authority and HDR Engineering, Inc. January 1991.

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**Menomonee River Priority Watershed, WI**

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**Agency:**

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Section

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**Notes:**

This appendix includes a separate profile on the Wisconsin Nonpoint Source Water Pollution Abatement Program.

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**Year and Method of Establishment**

The Menomonee River Priority Watershed plan was prepared under the provisions of the Wisconsin Nonpoint Source Water Pollution Abatement Program, initiated in 1984 under Chapter NR 120, Wisconsin Administrative Code.

**Mission Statement/Strategic Focus**

The Menomonee River Watershed is one of five watersheds within the Milwaukee River Watershed, an 838 square mile drainage that flows into Lake Michigan at Milwaukee, Wisconsin.

The management plan sets forth several goals:

- Overall, a 50 percent reduction in the existing 1985 sediment loading is needed to improve the aquatic habitat in nearly all streams in the watershed.
- A high reduction level (50 percent to 70 percent) in phosphorus loading to most streams is needed to reduce the prevalence of excessive aquatic weed and algae growth.
- A reduction in the concentration of heavy metals and other toxic materials in urban runoff. In this watershed, lead is used as an indicator pollutant for evaluating the impact of urban runoff on water quality.



- Watershed wide, a 35 percent to 70 percent reduction in lead concentrations in stormwater effluents is needed to achieve a level below the acute toxicity standard set forth in Chapter NR 105 of the Wisconsin Administrative Code.
- A reduction in heavy metals from future urban areas, existing and planned areas) to 50 percent of the 1985 level will also be needed to reduce the lead concentrations measured in the Menomonee River to levels that do not violate toxicity standards for fish and aquatic life.

### **Geographic Scale**

The Menomonee River Watershed includes 167 miles of streams within an area of 136 square miles. There are no significant lakes.

### **Mechanism for Intergovernmental Coordination**

The management plan is a cooperative, coordinated system administered by the Department of Natural Resources. The counties, participants in the preparation of the watershed assessment which is the basis for the plan, participate in the planning process via resolution of the County Boards of Supervisors. The counties enter into agreements with DNR for the purpose of receiving funds for management, enforcement, and cost-sharing with private property owners and land operators.

### **Sources of Funding and Budget Information**

The state program provides cost-share funds to assist in implementing the nonpoint program. Projects may be funded up to five years after the watershed plan is approved by DNR. Funding does not cover some costs such as land acquisition or the renovation or construction of new storm sewer systems needed to comply with this program or other state or federal laws.

The state program provides for cost-sharing agreements to be entered into between the participating counties and landowners or land operators. If landowners fail to participate voluntarily, the offer of the cost-sharing arrangement may be revoked and a low-interest loan arrangement may be substituted.

Best Management Practice	State Cost-Share Rate	
<u>Rural BMPs</u>		
Contour Farming.....	50%	*
Contour Strip Farming .....	50%	*
Field Strip Cropping.....	50%	*
Field Diversions and Terraces.....	70%	
Grassed Waterways .....	70%	
Reduced Tillage.....	50%	
Critical Area Stabilization .....	70%	1
Grade Stabilization Structures.....	70%	
Agricultural Sediment Basins.....	70%	
Shoreline and Streambank Stabilization.....	70%	
Shoreline Buffers .....	70%	1
Barnyard Runoff Management.....	70%	
Animal Lot Relocation.....	70%	
Manure Storage Facilities.....	70%	**
Livestock Exclusion from Woodlots .....	50%	
Wetland Restoration.....	70%	1
Roofs for Barnyard Runoff Management & Manure Storage Facilities .....	70%	
Nutrient and Pesticide Management.....	50%	2
<u>Urban BMPs</u>		
Critical Area Stabilization .....	70%	3
Grade Stabilization Structures.....	70%	
Shoreline and Streambank Stabilization.....	70%	
Shoreline Buffers .....	70%	3
Wetland Restoration.....	70%	3
Structural Urban Practices.....	70%	4
Street Sweeping .....	50%	5

1. Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs.
2. Spill control basins have a cost-share rate of 70 percent.
- \* Wildlife habitat restoration components of this practice are cost-shared at 70 percent.
- \*\* Maximum cost-share amount is \$10,000 including no more than \$5,000 for manure transfer equipment.
3. Easements may be used in conjunction with these practices.
4. Applies only to structures for established urban areas. Established urban surfaces are considered to be those in existence prior to the date the DNR approves the watershed plan.
5. This is an alternative best management practice not listed in NR 120 of the Wisconsin Administrative Code..

The state cost-share rates for Best Management Practices are as follows:

Best Management Practice	Flat Cost-Share Rate
Contour Farming.....	\$6.00/ac.
Strip Cropping.....	\$12.00/ac.
Field Strip Cropping.....	\$10.00/ac.
Reduced Tillage.....	\$15.00/ac. 1
Reduced Tillage.....	\$45.00/ac. 2

1. Reduced tillage systems for short crop rotations, and establishment of forages and small grains (Includes no-till).
2. Reduced tillage systems for continuous row cropping or long rotations (does not include no-till).

The projected total budget for the rural portion of the watershed plan includes capital costs, easements, local government costs, information and education, and other direct costs. The table specifies the state share versus the local share.

**Menomonee River Priority Watershed Plan**  
**Projected Budget (8 Years) for Rural Operations**  
*(Assumes 75% Participation by Landowners and Land Operators)*

Cost Center	Ozaukee	Washington	Waukesha	Totals
BMP Capital Costs	\$ 205,589	\$ 138,233	\$ 49,695	\$ 393,517
Easement Costs	45,000	112,500	22,500	180,000
Staff Needs	106,973	128,740	51,355	287,067
Information Education/Direct	_____	_____	_____	0
Other Direct	15,000	15,000	8,000	38,000
Total State Share	\$ 372,562	\$ 394,473	\$ 131,550	\$ 898,584
Local Share	90,392	44,513	20,363	155,268
Total Budgeted Cost	\$ 462,954	\$ 438,986	\$ 151,913	\$ 1,053,852

The urban segment of the program provides services to thirteen municipalities including the City of Milwaukee. Cost-sharing will not cover the cost of land

acquisition or the renovation or construction of storm sewer systems. Cost-sharing is available for the following actions in addition to the listing of eligible BMPs above:

### Menomonee River Priority Watershed Plan Urban Strategies Eligible for Funding

Urban Strategy	Flat Cost-Share Rate
Development of Construction Erosion Control Ordinances .....	100%
Development of Stormwater Management Ordinances .....	100%
Engineering Studies for Existing Urban Areas; Studies for Planned Urban Areas .....	100% 1
Design and Engineering for Structural BMPs .....	100%
Local Enforcement Staff.....	100% 2
Staff for Accelerated Street Sweeping.....	100% 2
Development of alternative financing and admin. strategies .....	100%

1. Funding not available for components dealing exclusively with drainage and flooding.
2. Funding limited to five years. Level of staffing based on a work plan submitted by local units of government and approved by the DNR.

For the thirteen municipalities, the DNR estimates the cost of detailed engineering feasibility studies to be \$5,411,500. The cost of implementing the recommended urban program in existing urban areas ranges from \$90,880,000 to \$181,780,000 (50 percent to 100% participation), the state's share being \$11,814,000 to \$23,628,800 (50 percent to 100% participation). The cost of implementing the recommended urban practices in planned urban areas amount to \$3,451,600 for wet detention strategies and \$444,720 for stormwater management planning. Some of the counties have indicated that they may have difficulty allocating the large non-state sums to the program.

## Management

### Organizational Structure

The plan is carried out under a joint plan approved by the Wisconsin Department of Natural Resources, the Department of Agriculture, Trade and Consumer Programs, and the Counties of Ozaukee, Washington, and Waukesha. Also participating are the Soil Conservation Service and the Agricultural Stabilization and Conservation Service. The University of Wisconsin Extension provides support in developing and conducting a public information and education program aimed at increasing voluntary participation in the project. Thirteen cities and villages including the City of Milwaukee participate in the urban program.

## Types of Authority

Landowners, land operators, villages, cities, counties, and state agencies all have a hand in implementing this program. Their *major* responsibilities are as follows:

***Landowners and Land Operators:*** Adopt Rural Best Management Practices which reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources.

For the urban program, private landowners in certain circumstances will install BMPs on their property.

***Villages and Cities:*** For the rural program, enact a manure storage ordinance meeting the provisions outlined by the Department of Agriculture, Trade and Consumer Protection in Ag 166.98. The intent of this ordinance is to prevent pollution of groundwater by poorly designed and constructed animal waste storage facilities.

For the urban program, there are two parts to the program, a set of core programs and segmented programs (those projects requiring site specific investigations prior to implementation). The core tasks are to

- Enact an adequate construction erosion ordinance
- Develop and implement a community specific program of urban housekeeping practices that reduce urban nonpoint source pollution
- Implement the information and education strategy.

The segmented program tasks are to:

- Identify high priority segments the community wishes to pursue in existing and planned urban areas, including an evaluation of source reduction and financing.
- Conduct engineering feasibility and site location studies for high priority areas.
- Adopt, administer, and enforce a comprehensive stormwater management ordinance.
- Enter into cost-share agreements for eligible BMPs.
- Conduct detailed alternative financing/implementation studies which determine the means to pay for administering nonpoint source control program in each municipality.

***Counties of Ozaukee, Washington, and Waukesha:***

For the rural program:

- Develop farm conservation plans consistent with the needs of the project
- Enter into nonpoint source cost-share agreements with eligible landowners and enforce the terms and provisions of the agreements and management their reimbursement
- For county-owned and operated lands, enter into cost-share agreements with the DNR to correct identified nonpoint sources and fulfill their obligations as cost-share recipients
- Design best management practices and verify proper practice installation
- Prepare and submit annual work plans and an annual work load analysis and grant application to the Department of Agriculture, Trade and Consumer Protection
- Prepare and submit annual resource management reports to monitor implementation by tracking changes in the nonpoint source inventory and quantifying pollutant load reductions which result from installing BMPs.
- Conduct the information and education activities identified in the plan for which they are responsible

For urban areas, the counties must take the same urban actions as municipalities for their unincorporated areas.

***Department of Natural Resources:*** DNR responsibilities include project administration, financial support via local assistance grant agreements and nonpoint source grant agreements; project evaluation; technical assistance; assisting county staff with site reviews of projects affecting wetlands or groundwater; and assisting county staff with the integration of fish and wildlife management concerns into the BMPs.

***Department of Agriculture, Trade and Consumer Protection:*** The DATCP role is identified in s. 144.25, stats, ch. 92 stats; and NR 120. The major responsibilities are: manage a training program for the staff involved in implementation; act as a clearinghouse for information related to agricultural BMPs, sustainable agriculture and nutrient and pest management; assist in carrying out the information and education programs, assist in identifying watershed participants subject to federal or state conservation compliance programs; assist counties in developing manure storage ordinances; assist in developing technical standards for agricultural BMPs; and assist in evaluating the site specific practicality of implementing rural BMPs.

**Management Techniques**

This is a management plan for the abatement of rural nonpoint source pollution. The Best Management Practices employed generally use specific standard specifications

included in the Soil Conservation Service Field Office Technical Guide. Additional specifications may apply. The techniques used in this plan include:

Contour Farming	Grade Stabilization Structures
Contour Strip Cropping	Agricultural Sediment Basins
Field Strip Cropping	Shoreline and Streambank Stabilization
Field Diversions and Terraces	Shoreline Buffers
Grassed Waterways	Barnyard Runoff Management
Reduced Tillage	Animal Lot Relocation
Critical Area Stabilization	Manure Storage Facilities
Livestock Exclusion from Woodlots	Wetland Restoration
Roofs for Barnyard Runoff Management & Manure Storage Facilities	Nutrient and Pesticide Management

### **Enforcement Mechanisms**

Wisconsin DNR has the power to review and approve local plans, including all aspects of administration and management. Stormwater management plans must be consistent with the state model ordinance and must meet pollutant reduction goals. Individual BMPs are controlled via contract. Landowners or operators required to participate but who do not lose the cost-share arrangement in favor of a low-interest loan program.

### **Monitoring System**

The plan includes a regimen for monitoring both administrative and pollutant load management systems. Ozaukee County is primarily responsible for administrative and pollutant load tracking. The system uses CAMPS, the Computer Assisted Management and Planning System, developed by SCS.

### **How Long Has the Plan of Management Been in Force?**

The management plan was prepared and approved in March 1992. An earlier regional nonpoint water quality management plan was prepared by the South Eastern Wisconsin Regional Planning Commission in 1979.

### **Representative Projects**

Not applicable.

### **Grassroots Involvement**

DNR convened the Menomonee River Advisory Subcommittee to assist in preparing the plan. Acting primarily as a policy guidance group, it also reviewed plan chapters.

Members included representatives of local governments, conservation groups, interested citizens, and utility and planning agencies.

This plan has an extensive program built in for raising public awareness and providing public information. The program uses printed materials, audio-visual programs, exhibits, media, tours, demonstrations, signs, workshops, meetings, and youth education. Sub-groups specifically targeted include rural landowners and operators, local governments, urban residents, business and industry, and youth. The program is tailored for each sub-group.

#### **Program benefits identified to date**

The plan has been in operation for less than one year. No data available.

#### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

Region V of the US EPA provided Section 319 funds to pay in part for this plan.

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### **Sources**

#### **Key Enabling and Governance Documents**

The enabling legislation is woven into the state administrative code.

#### **Watershed Management Documents**

*A Nonpoint Source Control Plan for the Menomonee River Priority Watershed Project.*, Prepared cooperatively by the Wisconsin Department of Natural Resources; and the Department of Agriculture, Trade and Consumer Protection, in cooperation with the Ozaukee, Washington, and Waukesha County Land Conservation Departments and the Menomonee River Advisory Subcommittee. March 1992. Publication WR-244-92.

*Nonpoint Source Evaluation Monitoring Activities.* Prepared by the Wisconsin Department of Natural Resources. March 1991. Publication WR-279-91.

*Fields and Streets*, the Newsletter for Wisconsin's Nonpoint Source Water Pollution Abatement Program. Wisconsin Department of Natural Resources.



## Middle Fork River Watershed Pilot Project

### Agency

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**Agency:**

Middle Fork River Watershed Project  
West Virginia Division of  
Environmental Protection

**Telephone:**

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**Address:**

10 McJunkin Road

**Fax Telephone:****City-ST-Zip:**

Nitro, WV 25143

**Contact Person:**

Ken Politan

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**Notes:**

Preparation is underway to develop a watershed plan for the Middle Fork River next year.

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### Year and Method of Establishment

On February 21, 1991 in West Virginia a signing of a Memorandum of Understanding (MOU) took place to address the problems of nonpoint acid mine drainage in the rivers of West Virginia. The signatory agencies include: the West Virginia Division of Natural Resources, the West Virginia Division of Environmental Protection, the West Virginia State Soil Conservation Committee, the U.S. Office of Surface Mining, the U.S. Environmental Protection Agency, and the U.S. Soil Conservation Surface.

### Mission Statement/Strategic Focus

The main objective of this MOU is to reduce the harmful effects caused by acid mine drainage through the establishment of a national pilot program for the watershed. Activities will involve technical, regulatory, and procedural aspects.

### Geographic Scale

The Middle Fork River Watershed encompasses a 151 square miles in three counties of north central West Virginia. The area includes roughly 227 miles of stream course.

### Mechanism for Intergovernmental Coordination

The Memorandum of Understanding described above.

## **Sources of Funding**

The major sources of funds for this project include the West Virginia Division of Environmental Protection special reclamation funds for bond forfeiture sites, Abandoned Mines Lands Fund (AML) administered by the U.S. Office of Surface Mining, Rural Abandoned Mine Program (RAMP) portion of AML funds, 10 percent set-aside of AML funds established under the 1990 SMCRA Amendments, and the Nonpoint Source Program under Section 319(h) of the Clean Water Act. This project will continue to coordinate the activities and seek the financial support of support groups other than the signatory agencies.

## **Budget Information**

The estimated cost of reclaiming the mine sites is \$5 million. As additional information is obtained concerning the treatment of these mines, the budget will be adjusted accordingly.

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## **Management**

### **Organizational Structure**

The signatory agencies have developed work plans to achieve the goals established by the pilot program.

### **Degree of Authority**

The agencies have the capability under existing authority to undertake this pilot project.

### **Management Techniques**

Initial efforts to reduce acid mine drainage and reclaim abandoned mine lands have included the construction of alkaline trenches leading to a wetland system, construction of wetlands designed to treat acid mine drainage, and land reclamation activities. BMPs have been initiated in the watershed to improve the water quality in the river and to restore water uses downstream. Actions taken in situ to remedy the acid mine drainage are:

- Design, construction and monitoring of four engineered wetland cells

Additional work done included the assessment phase: inventory of abandoned mines and active mines, undertake ongoing monitoring of the Pierce Contour engineered wetland (an abandoned mine site); mapping and database compilation of inventoried

sites and water quality data; surface and groundwater quality monitoring plan; biomonitoring plan for each surface water station; and a public information campaign to secure applications for assistance under the Rural Abandoned Mine Program.

Future programs include fish re-stocking, additional abatement sites, and fish habitat improvements (shading, vegetation, and establishment of pools and riffles).

### **Enforcement Mechanisms**

Enforcement falls to the existing authorities of the participating agencies. No special enforcement programs have been enacted for this pilot project.

### **Monitoring System**

The lower 24 miles of the river, where the most damage has occurred, is monitored.

### **Representative Projects**

This is a pilot project.

### **Grassroots Involvement**

No active public involvement, although the public may be involved later in order to build additional support for the project.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

US EPA provided section 319h funds to assist with the project. Funds paid for the establishment of a geographic information system, a baseline monitoring program, installation of an engineered wetland to assimilate acid mine drainage, and continued efforts to evaluate and implement abatement technology at sites identified as causing major stream degradation.

Funds under Section 106 have been used to support groundwater monitoring at six stations.

Region III personnel provide technical assistance and to investigate potential resources to support the project.

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## Sources

### Key Enabling and Governance Documents

Memorandum of Understanding, February 21, 1991, between the Office of Surface Mining, US Department of the Interior; US Environmental Protection Agency; US Soil Conservation Service; West Virginia Soil Conservation Committee; WV Department of Commerce, Labor, and Environmental Resources, Division of Natural Resources, Division of Energy (now the Division of Environmental Protection)

### Watershed Management Documents

Federal and State Cooperative Effort to Reduce Acid Mine Drainage in the Middle Ford River Watershed. By signatory parties. April 1992. Produced under cooperative agreement with US EPA by the Terrene Institute.

## Mississippi Headwaters Board

### Agency

Agency:  
Mississippi Headwaters Board

Telephone:  
218-547-3300

Address:  
Cass County Courthouse

Fax Telephone:  
218-547-2440

City-ST-Zip:  
Walker, Minnesota 56484

Contact Person:  
Molly MacGregor

### Notes:

The MHB is a corridor plan, not a watershed plan, but it includes many management elements for nonpoint source control.

### Year and Method of Establishment

The Mississippi Headwaters Board (MHB) was established in 1980 under a joint powers agreement of the eight counties in the headwaters region of the Mississippi River. It was formed in response to a proposal to designate the river as a component of the National Wild and Scenic Rivers System.

### Mission Statement/Strategic Focus

The tasks of the MHB include preserving and protecting the shorelands of the River and the lakes in the signatory counties, stewardship, and water quality. The Board was also assigned the task of conducting an inventory of the resources in the vicinity, including such aspects as cultural sites, protected waters, scenic waters, endangered species, and recreational areas.

### Geographic Scale

The first four hundred miles of the River are included as under the authority of the MHB. The Board's authority stretches over an area of 1000 feet in wild areas, and 500 feet in populated areas.

### **Mechanism for Intergovernmental Coordination**

The board must depend upon counties for information due to the small size of the organization and the amount of land covered. The MHB requires that county commissioners report on development within their area in order to provide for a constant and consistent flow of information between agencies. Due to this dependency upon county officials, the MHB hosts annual training sessions for local officials. One mechanism for intergovernmental coordination used by the MHB has been the development of working relationship with other agencies.

### **Sources of Funding and Budget Information**

In 1990 the MHB received a grant from the Charles B. Blandin Foundation to develop a Mississippi Headwaters River Watch. This River Watch is to be a citizen's river monitoring and protection group. This program is designed to complement the other monitoring programs of the MHB.

The State of Minnesota provides a grant of \$95,000, which the counties must match with in-kind services. The total annual budget is approximately \$250,000.

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## **Management**

### **Organizational Structure**

The Board consists of eight representatives, one appointed from each of the signatory counties. The Board convenes once a month, and is served by a committee comprised of zoning officers and land commissioners from the signatory counties, the Chippewa National Forest, county Soil and Water Conservation Districts, townships, and the Minnesota Department of Natural Resources, and property owners from each of the signatory counties, and four members at large. These individuals represent conservation groups, recreational groups, agriculture, cultural interest, and the like.

### **Degree of Authority**

The MHB is established by Minnesota Statutes (103F.361-.377). The Board has the power to certify local zoning decisions. The Board receives its mandate through the adoption of shoreline ordinance and land use and recreation management plans. The Board can then review and certify actions that are variances of the ordinance.

### **Management Techniques**

While the MHB's direct management area extends back from the Upper Mississippi only 1,000 feet, the management focus on nonpoint source control is as strong as that

for the Chesapeake Bay Critical Area Program. The program employs the following management techniques:

**Stormwater Management.** BMPs for urban water quality described by the Minnesota Water Pollution Control Agency are recommended for use.

- Existing natural drainageways, wetlands, and vegetated soil surfaces must be used to convey, store, filter, and retain stormwater runoff before discharge to public waters.
- When conditions prevent the use of natural features and vegetation for controlling stormwater runoff, constructed devices may be used with preference given to the use of surface drainage, vegetation, and infiltration rather than pipes or man-made facilities.
- Development must be planned and conducted in a manner that will minimize the extent of disturbed areas, runoff velocities, erosion potential, and reduce and delay runoff volumes. Disturbed areas must be stabilized and protected soon after and facilities or methods used to retain sediment on site.
- New development may not have impervious surface coverage of more than 25 percent; stormwater facilities must adhere to the field office technical guide of the County Soil and Water Conservation District; and stormwater outfalls must be filtered or settled and surface-skimmed to trap suspended elements before discharge; and a natural landscape protection plan must be prepared.

**Shoreland Alternation.** Alterations of vegetation or topography are regulated to prevent erosion to public waters, fix nutrients, preserve shoreland aesthetics, prevent bank slumping, and for other purposes.

- For agricultural uses, a conservation plan that maintains vegetation on steep slopes, avoids bluff impact zones, and operates meets the minimum standards of the County Soil and Water Conservation District recommendations for agriculture and water quality is required.
- A vegetation management plan is required to minimize erosion and to protect water quality.
- New animal feedlots are prohibited in the river corridor.
- Existing feedlots may continue provided they are not expanded.
- Best management practices are required for forestry practices
- Intensive vegetation clearing within the setback and bluff impact zones and on steep slopes is not allowed. Drainage or filling of wetlands is generally not permitted.

**Public Roads and River Crossings.** New road construction and reconstruction is sharply controlled to avoid sensitive areas and minimize adverse impacts. Some of the hazards that should be avoided are:

Areas of plastic soils subject to extensive slippage	Intrusions into stream valleys and open exposures of water	Ridge crests and high points
Building within 200 feet of the Mississippi River	Areas with high water tables	Forests (prefer forest fringes)
Soils whose high susceptibility to erosion would create sedimentation and pollution problems	Cuts and fills during construction	Open space recreation areas
Wetlands	Steep slopes	

**Sand, Gravel, and Borrow Pits.** This is a conditional use for which site development and restoration plans are required. They are designed to control dust, discharge of materials that may be pollutants, vegetative alterations, topographic alterations, soil erosions, groundwater contamination, and the system for rehabilitation.

### Enforcement Mechanisms

The capability to review and approve local zoning decisions is the teeth in the MHB enforcement program. Violators are required to take down/replace what has been damaged. MHB may assess fines or initiate remedial litigation to secure enforcement.

The MHB's biggest obstacle has been the refusal of state agencies to incorporate the Board's authority to certify local zoning decisions in their planning process. A suggested way of improving the authority of the Board is to expand the role of the Board under the Clean Water Act to address water quality.

The MHB has achieved success in the denial of zoning permits due to the adoption of uniform codes for the eight counties involved.

### Monitoring System

The MHB reviews the operations of its member counties and cooperating managing agencies. Monitoring has long since been a goal of the Mississippi Headwaters Board. With the assistance of the River Watch Network, a monitoring system called the Mississippi Headwaters River Watch has been implemented. The program is a partnership of school, citizen groups, government agencies, and private sector individuals who work together to realize the potential damage of human use on river resources. Some of the practices monitored include failing septic tanks, land development, vegetation removal, and agricultural practices.



## **Representative Projects**

### **Grassroots Involvement**

The MHB is involved with the public through the dissemination of information and education. The Board provides information on the impact of land use on water quality through the publication of a User's Guide to Shoreland Development and a video on lakes. The Board traditionally relies on non-traditional methods to get their point across; such as a training workshop held for the administration of local land use regulations. The MHB also produces a newsletter, public education materials, canoe trips, and property guides.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

None

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## **Sources**

### **Key Enabling and Governance Documents**

The Minnesota Statutes, Mississippi Headwaters Conservation Ordinance, Mississippi Headwaters Management Plan.

### **Watershed Management Documents**

Mississippi Headwaters Management Plan. Mississippi Headwaters Board. July 1992.

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**Nisqually River Council, WA**

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Agency:  
Nisqually River Council

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(206) 459-6780 / 438-7425

Address:  
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Fax Telephone:  
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Yelm, WA 98597

Contact Person:  
Steve Craig or Peter Moulton

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**Notes:**

The River Council is staffed by personnel from the WA Department of Ecology

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**Year and Method of Establishment**

The Nisqually River Management Plan was adopted by the Washington State legislature in June of 1987. The plan was prepared pursuant to an act of the legislature adopted in 1985 directing the Department of Ecology to prepare a plan which provided for a balanced stewardship of the basin's economic, cultural and environmental resources. The river was first recognized in 1972 under the state Shorelands Management Act which identified the Nisqually as a river of statewide significance.

**Mission Statement/Strategic Focus**

The twenty-one member Nisqually River Council is a broadly-based organization committed to the protection and enhancement of the Nisqually River and its basin.

**Geographic Scale**

The river is 78 miles in length, extending from its origins as the west drainage of Mount Rainier on the Nisqually Glacier in Mount Rainier National Park, downstream through the Nisqually Indian Reservation, the Fort Lewis military complex to the Nisqually National Wildlife Refuge on Puget Sound. Flowing through three counties, the management area extends back from the river a maximum of 3/4 of a mile. The boundary is defined by viewshed. The Council is actively involved in issues throughout the basin. The watershed covers 722 square miles.

## **Mechanism for Intergovernmental Coordination**

The state legislation provides for the formation of the Nisqually River Council as an interagency body that functions through the use of its members existing authorities and as an advocate and coordinator of agency actions.

## **Sources of Funding and Budget Information**

The program is funded through the Department of Ecology by the legislature. The annual budget is \$100,000, of which 50% is spent on staff and 50% on projects. Project money is matched on a 1 to 1 basis by other agencies participating directly in the project.

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## **Management**

### **Organizational Structure**

There are twenty-one agencies and units of government that are members of the Nisqually River Council. They are: three counties (Pierce, Thurston, and Lewis), three municipalities (Town of Yelm, Town of Eatonville, City of Roy), seven state agencies (Parks and Recreation Commission, Secretary of State, and the Departments of Natural Resources, Agriculture, Ecology, Fisheries, and Wildlife), the University of Washington's Pack Experimental Forest, Fort Lewis, US Army Corps of Engineers, Nisqually Indian Tribe, Nisqually National Wildlife Refuge, Mount Rainier National Park, Gifford Pinchot National Forest, and Tacoma City Light. In addition, there is the Citizens Advisory Committee with twenty-one members representing all facets of the public. The CAC sends three to the Council itself. The Council and Advisory Committee meets monthly.

### **Types of Authority**

The Council relies on the existing authorities of its members. Its central powers are those of advocacy for the river and coordination of actions of member agencies.

### **Management Techniques**

The use of existing authorities implies that member agencies and governments will make many decisions regarding the Nisqually River plan. For instance, two of the three counties have moved during the past year to incorporate the plan into their comprehensive land use and zoning plans, one as an endorsement that carries a commitment of consistency, the other by adding the plan as overlay zone. Stormwater management plans are in preparation, and special water quality studies are underway.

**Enforcement Mechanisms**

The council relies on effective coordination to generate appropriate enforcement actions by the member agencies.

**Monitoring System**

The Council maintains an active program for monitoring water quality through a Riverwatch-type effort. Additionally, the program funded the purchase of water quality equipment for the Nisqually Tribe.

**How Long Has the Plan of Management Been in Force?**

The plan was approved in June 1987.

**Representative Projects**

The Nisqually Basin Watch enables citizens who live in or visit the Nisqually area to help protect it by alerting the proper authorities in case of illegal burning, dumping, poaching, or similar activities.

The Nisqually River Education Project works through the Yelm school district. A field-oriented environmental education program, it is a Riverwatch-type program. There is also a separate water quality monitoring program.

**Grassroots Involvement**

A citizens advisory committee with twenty-one members regularly meets to provide advice and convey citizen concerns to the river council.

**Program Benefits Identified to Date**

Program staff indicates that the primary benefit has been unanimity of purpose among the participating agencies and units of government.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

The program was a Northwest region finalist in EPA's 1992 national Pollution Prevention Awards for geographic initiatives.

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## Sources

### Key Enabling and Governance Documents

WA SHB 323, 1985. Study authorization. Washington State legislature.

### Watershed Management Documents

Nisqually River Management Plan. Nisqually River Task Force, Shorelands and Coastal Zone Management Program, Washington Department of Ecology. Olympia, WA. 1987.

Nisqually River Public Access Site Feasibility Analysis. Prepared by Jones & Jones, Architects and Landscape Architects, for the Nisqually River Council, through the Washington State Department of Ecology. June 1989.

Nisqually Basin Interpretation and Environmental Education Enhancement Feasibility Analysis. Prepared by Jones & Jones, Architects and Landscape Architects, for the Nisqually River Council, through the Washington State Department of Ecology. June 1988.

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**Lower East Branch Pecatonica River Priority Watershed, WI**

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**Agency:**

Wisconsin Dept. of Natural Resources  
Nonpoint Source and Land Mgmt.

**Section**

Bureau of Water Resources Mgmt.

**Address:**

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P.O. Box 7921

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**Contact Person:**

Rebecca R. Wallace, P.E., Chief

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**Notes:**

This appendix includes a separate profile on the Wisconsin Nonpoint Source Water Pollution Abatement Program.

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**Year and Method of Establishment**

The Lower East Branch Pecatonica River Priority Watershed plan was prepared under the provisions of the Wisconsin Nonpoint Source Water Pollution Abatement Program, initiated in 1989 under Chapter NR 120, Wisconsin Administrative Code.

**Mission Statement/Strategic Focus**

The Lower East Branch Pecatonica River Watershed plan has several goals:

- A 25 percent reduction in the sediment reaching streams from agricultural uplands in all subwatersheds.
- A 40percent reduction in streambank sediment delivered to all streams and a 25% overall repair of bank habitat in all subwatersheds.
- A 60 percent reduction in organic pollutants from barnyards in all subwatersheds with an emphasis on several high priority creeks.
- A 50 percent reduction in organic pollutants from winter-spread manure on "unsuitable" acres in all subwatersheds.
- A restoration of 30% of degraded wetlands.
- Control of gullies producing over 30 tons of sediment per site per year.

## **Geographic Scale**

The Lower East Branch Pecatonica River Watershed includes an area of 145 square miles and seventeen sub-watersheds. The Pecatonica drains into the Sugar River in southern Wisconsin which in turn flows into the Rock River, a tributary of the Mississippi River. Eighty-two percent of the land is agricultural, with a population of only 2,800.

## **Mechanism for Intergovernmental Coordination**

The management plan is a cooperative, coordinated system administered by the Department of Natural Resources. The counties, participants in the preparation of the watershed assessment which is the basis for the plan, participate in the planning process via resolution of the County Boards of Supervisors. The counties enter into agreements with DNR for the purpose of receiving funds for management, enforcement, and cost-sharing with private property owners and land operators.

## **Sources of Funding and Budget Information**

The state program provides cost-share funds to assist in implementing the nonpoint program. Projects may be funded up to five years after the watershed plan is approved by DNR. Funding does not cover some costs such as land acquisition or the renovation or construction of new storm sewer systems needed to comply with this program or other state or federal laws.

The state program provides for cost-sharing agreements to be entered into between the participating counties and landowners or land operators. If landowners fail to participate voluntarily, the offer of the cost-sharing arrangement may be revoked and a low-interest loan arrangement may be substituted.

The state cost-share rates for Best Management Practices are as follows:

### Lower East Branch Pecatonica River Priority Watershed Plan Cost Share Rates by Type of BMP

Best Management Practice	State Cost-Share Rate
<b><i>Rural BMPs</i></b>	
Contour Farming.....	50% *
Contour Strip Farming .....	50% *
Field Strip Cropping.....	50% *
Field Diversions and Terraces.....	70%
Grassed Waterways .....	70%
Reduced Tillage.....	50%
Critical Area Stabilization .....	70% 1
Grade Stabilization Structures.....	70%
Agricultural Sediment Basins.....	70%
Shoreline and Streambank Stabilization.....	70%
Shoreline Buffers .....	70% 1
Barnyard Runoff Management.....	70%
Animal Lot Relocation.....	70%
Manure Storage Facilities.....	70% **
Livestock Exclusion from Woodlots .....	50%
Wetland Restoration.....	70% 1
Roofs for Barnyard Runoff Management & Manure Storage Facilities .....	70%
Nutrient and Pesticide Management.....	50% 2

1. Easements may be entered into with landowners identified in the watershed plan in conjunction with these BMPs.
2. Spill control basins have a cost-share rate of 70 percent.
- \* Wildlife habitat restoration components of this practice are cost-shared at 70 percent.
- \*\* Maximum cost-share amount is \$10,000 including no more than \$5,000 for manure transfer equipment.



### Lower East Branch Pecatonica River Priority Watershed Plan Flat Cost Share Rates

Best Management Practice	Flat Cost-Share Rate
Contour Farming.....	\$6.00/ac.
Strip Cropping.....	\$12.00/ac.
Field Strip Cropping.....	\$10.00/ac.
Reduced Tillage.....	\$15.00/ac. 1
Reduced Tillage.....	\$45.00/ac. 2

1. Reduced tillage systems for short crop rotations, and establishment of forages and small grains (Includes no-till).
2. Reduced tillage systems for continuous row cropping or long rotations (does not include no-till).

The projected total budget includes capital costs, easements, local government costs, information and education, and other direct costs. The table specifies the state share versus the local share.

### Lower East Branch Pecatonica River Priority Watershed Plan Projected Budget (8 Years) for Operations (Assumes 75% Participation by Landowners and Land Operators)

Cost Center	Green	Lafayette	Totals
BMP Capital Costs	\$ 1,412,668	\$ 1,658,798	\$ 3,071,466
Easement Costs	129,300	229,500	358,800
Staff Needs	667,714	713,121	1,380,835
Information Education/Direct	2,002	2,002	4,004
Other Direct	100,000	100,000	200,000
Total State Share	\$ 2,311,684	\$ 2,703,421	\$ 5,015,105
Local Share	623,076	728,753	1,351,829
Total Budgeted Cost	\$ 2,939,760	\$ 3,432,174	\$ 6,366,934

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## Management

### Organizational Structure

The plan is carried out under a joint plan approved by the Wisconsin Department of Natural Resources, the Department of Agriculture, Trade and Consumer Programs, and the Counties of Green and Lafayette. Also participating are the Soil Conservation Service and the Agricultural Stabilization and Conservation Service. The University of Wisconsin Extension provides support in developing and conducting a public information and education program aimed at increasing voluntary participation in the project.

### Types of Authority

Landowners, land operators, villages, cities, counties, and state agencies all have a hand in implementing this program. Their *major* responsibilities are as follows:

***Landowners and Land Operators:*** Adopt Rural Best Management Practices which reduce nonpoint sources of water pollution and protect and enhance fish, wildlife and other resources.

***Counties of Green and Lafayette:*** Enact a manure storage ordinance meeting the provisions outlined by the Department of Agriculture, Trade and Consumer Protection in Ag 166.98. The intent of this ordinance is to prevent pollution of groundwater by poorly designed and constructed animal waste storage facilities.

- Develop farm conservation plans consistent with the needs of the project
- Enter into nonpoint source cost-share agreements with eligible landowners and enforce the terms and provisions of the agreements and management their reimbursement
- For county-owned and operated lands, enter into cost-share agreements with the DNR to correct identified nonpoint sources and fulfill their obligations as cost-share recipients
- Design best management practices and verify proper practice installation
- Prepare and submit annual work plans and an annual work load analysis and grant application to the Department of Agriculture, Trade and Consumer Protection
- Prepare and submit annual resource management reports to monitor implementation by tracking changes in the nonpoint source inventory and quantifying pollutant load reductions which result from installing BMPs.
- Conduct the information and education activities identified in the plan for which they are responsible

***Department of Natural Resources:*** DNR responsibilities include project administration, financial support via local assistance grant agreements and nonpoint source grant agreements; project evaluation; technical assistance; assisting county staff with site reviews of projects affecting wetlands or groundwater; and assisting county staff with the integration of fish and wildlife management concerns into the BMPs.

***Department of Agriculture, Trade and Consumer Protection:*** The DATCP role is identified in s. 144.25, stats, ch. 92 stats; and NR 120. The major responsibilities are: manage a training program for the staff involved in implementation; act as a clearinghouse for information related to agricultural BMPs, sustainable agriculture and nutrient and pest management; assist in carrying out the information and education programs, assist in identifying watershed participants subject to federal or state conservation compliance programs; assist counties in developing manure storage ordinances; assist in developing technical standards for agricultural BMPs; and assist in evaluating the site specific practicality of implementing rural BMPs.

## **Management Techniques**

This is a management plan for the abatement of rural nonpoint source pollution. The Best Management Practices employed generally use specific standard specifications included in the Soil Conservation Service Field Office Technical Guide. Additional specifications may apply. The techniques used in this plan include:

Contour Farming	Grade Stabilization Structures
Contour Strip Cropping	Agricultural Sediment Basins
Field Strip Cropping	Shoreline and Streambank Stabilization
Field Diversions and Terraces	Shoreline Buffers
Grassed Waterways	Barnyard Runoff Management
Reduced Tillage	Animal Lot Relocation
Critical Area Stabilization	Manure Storage Facilities
Livestock Exclusion from Woodlots	Wetland Restoration
Roofs for Barnyard Runoff Management & Manure Storage Facilities	Nutrient and Pesticide Management

Management activity is aimed at four specific areas:

- About 27,268 critical acres of agricultural lands with soil losses above 0.26 tons/acre/year and above the "T" measurement for tolerable soil losses
- Approximately 97 barnyard animal lots that contribute in excess of five pounds of phosphorus, with high priority given to those exceeding seven pounds
- Farm operations in which manure is spread on 10 or more unsuitable acres during winter. Unsuitable means have a slope in excess of 6 percent of that are flood prone.

- Farm operations with stream banks that are trampled, eroding at a rate in excess of 0.07 tons per linear foot per year and with stream banks in excess of 2,000 feet.

### **Enforcement Mechanisms**

Wisconsin DNR has the power to review and approve local plans, including all aspects of administration and management. Individual BMPs are controlled via contract. Landowners or operators required to participate but who do not lose the cost-share arrangement in favor of a low-interest loan program.

### **Monitoring System**

The plan includes a regimen for monitoring both administrative and pollutant load management systems. Green and Lafayette Counties are responsible for administrative and pollutant load tracking. The system using a CAMPS, the Computer Assisted Management and Planning System, developed by SCS.

### **How Long Has the Plan of Management Been in Force?**

The management plan was prepared and approved in September 1991. It was adopted in addition as an amendment to the regional water quality management plan for the Sugar-Pecatonica river basin.

### **Representative Projects**

Not applicable.

### **Grassroots Involvement**

This plan has an extensive program built in for raising public awareness and providing public information. The program uses printed materials, audio-visual programs, exhibits, media, tours, demonstrations, signs, workshops, meetings, and youth education. Sub-groups specifically targeted include rural landowners and operators, local governments, urban residents, business and industry, and youth. The program is tailored for each sub-group. An advisory group is planned.

### **Program Benefits Identified to Date**

The plan has been in operation for less than two years. No data available.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

Region V of the US EPA provided Section 319 funds to pay in part for this plan.

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## Sources

### Key Enabling and Governance Documents

The enabling legislation is woven into the state administrative code.

### Watershed Management Documents

*Nonpoint Source Control Plan for the Lower East Branch Pecatonica River Priority Watershed Project.* Prepared cooperatively by the Wisconsin Department of Natural Resources; and the Department of Agriculture, Trade and Consumer Protection, in cooperation with the Green and Lafayette County Land Conservation Departments. June 1992. Publication WR-288-92.

*Nonpoint Source Evaluation Monitoring Activities.* Prepared by the Wisconsin Department of Natural Resources. March 1991. Publication WR-279-91.

*Fields and Streets*, the Newsletter for Wisconsin's Nonpoint Source Water Pollution Abatement Program. Wisconsin Department of Natural Resources.

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**Puget Sound Water Quality Authority**

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**Agency**

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**Agency:**

Puget Sound Water Quality Authority

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**Fax Telephone:****City-ST-Zip:**

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**Contact Person:**Cathy Minsch, 206-493-9408 direct

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**Notes:**

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**Year and Method of Establishment**

The Puget Sound Water Quality Authority was created in 1985 by an act of the Washington State Legislature. (RCW 90.70.001)

**Mission Statement/Strategic Focus**

The Puget Sound Water Quality Authority along with EPA Region X and the Washington Department of Ecology manages the Puget Sound Estuary Program. The principle responsibility of the Authority is to oversee development and implementation of the Puget Sound Water Quality Management Plan. Major initiatives under this plan include: monitoring, research, education and public involvement, nonpoint source pollution, shellfish protection, municipal and industrial discharges, contaminated sediments and dredging, stormwater and combined sewer overflows, wetlands protection, spill prevention and response, laboratory support, household hazardous waste, and legal and personnel support. The plan aims to prevent the type of development that presents management challenges to more urbanized eastern estuaries—to not make the same mistakes. The goal of the nonpoint program is to reduce and ultimately eliminate harm from nonpoint sources of pollution to Puget Sound, including pathogens, toxic contaminants, and sediment.

The nonpoint program employs three strategies:

1. Target state and local resources on priority watersheds through a cooperative local watershed planning process
2. Supplement the watershed plans with education and preventive programs

3. Develop or enhance state programs or regulations for those nonpoint sources that are most effectively controlled at the state level

### **Geographic Scale**

The jurisdiction of the Authority includes the Puget Sound south of Admiralty Inlet; the waters north to the Canadian border, including portions of the Strait of Georgia; the Strait of Juan de Fuca just south of the Canadian border; and all of the land draining into these waters.

### **Mechanism for Intergovernmental Coordination**

The Puget Sound Water Quality Authority oversees implementation of the water quality management plan. It plays a coordinating role.

### **Sources of Funding and Budget Information**

Most of the funding has been requested from the state legislature, with the remaining assisted by the Centennial Clean Water Fund. Possible other sources of funding that has been identified include: discharge permit fees, the state general fund, the state toxics fund, local funding, and federal funding. Estimated costs in 1987 were \$26 million.

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## **Management**

### **Organizational Structure**

The Puget Sound Water Quality Authority has eleven members appointed by the governor. Both the Department of Ecology Director and the Commissioner of Public Lands serve as ex-officio members to the board. The authority holds monthly board meetings, as well as numerous informal meetings for citizen groups.

### **Degree of Authority**

Cannot require local governments to comply - but it is happening - required to submit bi-annual reports to measure degree of compliance.

### **Management Techniques**

The PSWQA standards for nonpoint source water pollution control provide for the adoption of watershed action plans by watershed management committees. These watersheds are chosen via the priority watershed selection process. Led by the Department of Ecology and the affected counties, the committee would have as

members all affected local governments, special purpose districts, tribes, interested state agencies, and others. The Department of Ecology administers a grant fund from the Centennial Clean Water Fund to finance the watershed action planning work. The Washington Conservation Commission funds local conservation districts to participate in the planning. Tax relief for property owners whose lands have been fenced as part of plan implementation may apply for open space tax status.

The following listing shows the array of management techniques employed under this program:

- Agriculture BMPs (consistent with the US SCS Technical Office Guide)
- Stormwater BMPs
- Control of on-site sewage disposal
- Education programs
- Certification of on site septic systems by qualified professionals
- Dairy Waste Management Plan
- Boater education program
- Construction of pumpouts at priority state parks
- Enforcement of marine sanitation device regulations
- Potential use of no-discharge areas
- No anchorage areas

The following table summarizes the estimated cost of the nonpoint program from the 1990-91 biennium through FY 1994 (in millions of dollars):

Fiscal Year	1999-91	1992	1993	1994
Budget Projection	\$13.6	\$9.4	\$8.9	\$6.9

*(In millions of dollars)*

### Enforcement Mechanisms

Oversee water quality monitoring, so it is in the best interest of local governments to comply with the objectives of the plan.

### Monitoring System

Measuring results project - interview people in watershed area to monitor how well plan is doing - also program to measure water quality.



**Representative Projects**

Stormwater program, outreach program - staff liaisons with local governments, wetlands program

**Grassroots Involvement**

Strongly encouraged by public outreach and input.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

Yes, via National Estuary Program, - very valuable.

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**Sources****Key Enabling and Governance Documents**

Statute - cwq070 - that created WQA, National Estuary Section 320 under Clean Water Act.

**Watershed Management Documents**

1989 Puget Sound Water Quality Management Plan. Adopted October 19, 1988. Puget Sound Water Quality Authority.

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## Suwannee River Water Management, FL

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### Agency

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<u>City-ST.-Zip:</u> Live Oak, Florida 32060	<u>Contact Person:</u> Marvin Raulston

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### Notes:

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### Year and Method of Establishment

Established in 1972 as a public agency by Chapter 72-299, Laws of Florida, 1972, under the provision of the Florida Water Resources Act.

### Mission Statement/Strategic Focus

"The mission of the Suwannee River Water Management District is to implement the programs described in Chapter 373, Florida Statutes, in order to manage water and related natural resources for the present and future residents of the region and the state" (p.9, Citizen's Guide). Elements of this statement include, the development of regulatory programs, implementation of land acquisition and management programs, the promotion of public awareness, to provide for the availability of water of sufficient quality, and to encourage nonstructural surfacewater management techniques.

### Geographic Scale

This district covers 9,950 square miles in two states (Florida and Georgia).

### Mechanism for Intergovernmental Coordination

In order to eliminate the duplication of permitting efforts, the District possesses the ability to enter into agreements with other agencies that hold powers that affect the water resources of the State. Agreement Number 82/83-1 between the District and the Florida Department of Environmental Regulation states that these two agencies entered

into agreement in regards to public drinking water applications, applications for projects involving the construction and operation of artificial recharge facilities, and applications for projects utilizing land disposal of treated wastewaters.

### **Sources of Funding and Budget Information**

Funding is provided through state grants, ad valorem taxes, permit and license fees, the SWIM fund, and also by the Florida Department of Resources for work dealing with the Water Quality Assurance Act.

The FY 1991 budget amounted to \$14.9 million, of which \$10.9 million was allocated to the Land Acquisition and Management Fund. The FY 1992 budget is estimated to increase to \$19.3 million, with \$13.9 million allocated to land acquisition and management. Each year \$1,286,400 is allocated to the SWIM fund, the Surface Water Improvement and Management Plan.

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## **Management**

### **Organizational Structure**

The Department of Permitting and Assistance is responsible for all of the regulatory programs within the District. These programs include: water use, surface water management, and the works of the District programs. This department must also provide technical assistance to local governments. The Department of Programming is responsible for all studies on water resource use, hydrological data collection, internal planning activities, and as an external liaison with State and Regional agencies, and local units of government. The Department of Program Support deals with the financial operation of the District. Its duties include budget preparation, payroll, purchasing, and maintenance of the physical plant. The Department of Land Acquisition and Management is responsible for the implementation of the District's Save Our Rivers Program. this program includes the acquisition and management of District lands. The Office of Public Information and Education produces publications, coordinates the annual District's River Day, and disseminates information to the public and the press.

### **Degree of Authority**

"The District is delegated authority by the Department of Environmental Regulation to assume certain responsibilities of Chapter 373, Florida Statutes. This delegation, general to the Water Management Districts, is pursuant to authority contained in sections 373.016 and 373.103, Florida Statutes, and is described in Section 17-101.040, Chapters 17-21 and 17-22, Florida Administrative Code"

The provisions used to identify and prioritize lands for the Save Our Rivers Programs are that they will be evaluated for their resource value for the purpose of establishing which parcels, in whole or in part, annually or seasonally, are conducive to general public recreational purposes. To Qualify for the Preservation 2000 program, areas must not only meet the requirements for the Save Our Rivers program, but must also show that a significant portion of the land is in imminent danger of being developed, a significant portion of the land is in danger of separation which would result in multiple ownership thus making the acquisition of the land difficult, appreciation of a significant portion of the land that makes purchasing the land a priority, a significant portion of the land serves to protect or recharge ground water and to protect other valuable natural resources, the project can be purchased at 80% of the appraised value or less, and if a significant portion of the land serves as habitat for endangered species or communities.

### **Management Techniques**

Three implementation programs: regulations, land acquisition, outreach. Statutory authority, legislative appropriations to buy land. Direct meetings with local governments. Work directly with local government and other agencies in Florida.

The District has purchased 59,062 acres of river front property through 1991, with contracts pending on another 1,112 acres. This results in the protection of 150 miles of river frontage within the district. The new five-year plan would acquire another 65,979 acres, or 327 miles of riverside lands, primarily in flood plains of the district's major rivers.

### **Enforcement Mechanisms**

Correct damage, fines, stop - work order - anything with in law.

### **Monitoring System**

Regional networks check quality and quantity of surface and ground water.

### **Representative Projects**

Major regulatory programs the district is involved in include: water use permitting, surfacewater management, regulation of wells, and well water contract licensing. Major nonregulatory programs include: Save Our Rivers, ground water basin resource availability inventories, emergency water shortage planning and procedures, minimum flows and levels, water resources studies and data collection, abandoned artesian well plugging, development of regional impact reviews, technical assistance to local governments, agricultural water management systems, water conservation, flood damage protection, wetlands protection, surfacewater improvement and management

(SWIM), water management plans, education, sewage treatment, Suwannee Area recreational development, springs restoration, and Suwannee River Restoration Coordination Committee.

### **Grassroots Involvement**

Very little general involvement by the public.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

Very indirect via State Department of Environmental Regulation. Valuable help.

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## **Sources**

### **Key Enabling and Governance Documents**

Suwannee River Water Management District Chapter 40B-1, Florida Administrative Code; Water Management Lands Trust Fund: CH. 373.59, Florida Statutes. 1987.

### **Watershed Management Documents**

Water Management Plan. 1992 Preliminary Draft. Suwannee River Water Management.

Coastal Rivers Basin: Surface Water Improvement and Management Plan. Suwannee River Water Management District. May 1991.

A Citizens Guide to the Responsibilities, Programs, Budget and Annual Work Plan of the Suwannee River Water Management District, Fiscal Year 1991-1992. Suwannee River Water Management District. 1991.

1992 Land Acquisition and Management Plan. Suwannee River Water Management District. December 19, 1991.

1990 Suwannee River Annual Report. Suwannee River Water Management District.

Agricultural and Forestry Activities; Surface Water Management Permitting Manual. Suwannee River Water Management District. Undated.

**Sweetwater Authority, CA**

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Sweetwater Authority

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**Notes:**

This project is listed to show design alternatives for managing urban runoff that affects urban water supply systems.

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**Year and Method of Establishment**

The Sweetwater Authority is a public agency serving the cities of Chula Vista, National City, and surrounding areas. Its service area includes about 160,000

**Mission Statement/Strategic Focus**

The mission of the Sweetwater Authority is to provide urban water supplies to the Cities of Chula Vista, National City, and surrounding areas. It also operates a water treatment plant in the watershed.

**Geographic Scale**

The Sweetwater Authority is in the South Bay area of San Diego County. It serves a population of about 160,000. The land area upstream of the Sweetwater Reservoir, the focus of this project, is 51,200 acres. Approximately 30 percent of the land area is developed (1982 estimate).

**Mechanism for Intergovernmental Coordination**

None.

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## **Sources of Funding and Budget Information**

The projected cost for the project is \$13 million. Being a public agency responsible for water supply, the Authority is negotiating contracts with upstream developers and property owners to recover the cost of the project through payment of developer fees enforced by the County of San Diego covering discretionary review.

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## **Management**

### **Organizational Structure**

The Sweetwater Authority is a California public agency.

### **Types of Authority**

The organization has the authority to levy developer fees on upstream property owners and land developers who contribute nonpoint runoff to the water column which can significantly diminish groundwater quality and surface water quality, both of which are fully appropriated under California water law and controlled by the Authority.

### **Management Techniques**

Upstream development is contributing polluted run-in to the Sweetwater Reservoir, a water supply reservoir serving downstream customers in Chula Vista, National City, and surrounding areas. The California Water Resources Control Board ordered the Authority in 1978 to divert these flows in order to prevent pollution of the water supply. The Authority has gone through several design plans to come up with a suitable project. The preferred alternative captures dry flow and stormwater runoff upstream of the reservoir and diverts it to be captured by retention ponds downstream. As many as four retention ponds would be constructed at the bottom of several sub-drainages. Consultants estimate the retention ponds would capture 90 percent of pollutants prior to being gradually released back into the Sweetwater River system.

### **Enforcement Mechanisms**

The Authority's only enforcement mechanism are its reserved water rights under California law and its ability to levy developer fees on parties that impinge on those appropriated water rights.

### **Monitoring System**

The Authority monitors water quality at several gauging stations in the river basin.

**How Long Has the Plan of Management Been in Force?**

The proposed project has been in design for the past eleven years. It has been 50% complete for two years. Plans for completion of the project are now in final design.

**Representative Projects**

Loveland Reservoir, Sweetwater Reservoir, Robert A. Perdue Water Treatment Plant.

**Grassroots Involvement**

None.

**Program Benefits Identified to Date**

Diversion of approximately 400 acre feet per year of poor quality water.

**Assistance Provided by US EPA; Assessment of Value of the Assistance**

None.

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**Sources****Key Enabling and Governance Documents**

None available.

**Watershed Management Documents**

Design Study: Urban Runoff Control Facilities—Sweetwater Reservoir. Luke-Dudek, Civil Engineers. Prepared for the Sweetwater Authority. September 1, 1982.

Preliminary Design Report: Sweetwater Reservoir—Urban Runoff Diversion System (Initial Work). Boyle Engineering Corporation. Prepared for the Sweetwater Authority. April 1989.

Preliminary Design Report for North Side Diversion Pond and Low-Flow Interceptor—Sweetwater Reservoir—Urban Runoff Diversion System. Boyle Engineering Corporation. Prepared for the Sweetwater Authority. June 1992.

Draft Environmental Impact Report: Phase II of the Sweetwater Reservoir Urban Runoff Diversion System. A.D. Hinshaw Associates. Prepared for the Sweetwater Authority. November 1992.



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**Tualatin River Critical Basin Project, OR**

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Notes:

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### **Year and Method of Establishment**

A suit was brought against US EPA in 1986 by environmental organizations alleging that Oregon was not implementing nondiscretionary actions required under Section 303 of the Clean Water Act in the Region X EPA service area. A 1987 consent decree issued by the US. District Court directed US EPA through the state of Oregon to enforce water quality management programs for streams classified as water quality-limited under the Clean Water Act. Under the settlement the state, through the Department of Environmental Quality, agreed to establish two total maximum daily loads (TMDL) per year, of which one of the first was the Tualatin River. Thus far, fifteen rivers in Oregon have been designated as priority waterbodies under the Department of Environmental Quality's Critical Basin Program. The Critical Basin Program is Oregon's system for designating priority watersheds under EPA rules for nonpoint source management.

### **Mission Statement/Strategic Focus**

The Tualatin was classified as a water quality-limited river after repeated violations of the standards for dissolved oxygen. The state's chlorophyll-a action level, an indicator of excessive algae growth, was also being exceeded. There are also concerns with bacteria, sediment, and temperature, especially in some tributaries. and nitrogen ammonia were recorded. The primary focus of the plan, upon completion of upgrades to existing waste treatment facilities, is to resolve the phosphorus loading problem in the river. The goal of the program is to improve water quality within the Tualatin River subbasin to meet the existing water quality standard.

## **Geographic Scale**

The Tualatin River Basin is in north central Oregon. . The watershed is about 700 square miles in area, of which about 7,500 acres is within the urban services area of the City of Portland. The basin is generally west of Portland within Washington County, the river flowing generally eastward into the Willamette River near Oregon City and south of Portland proper. In all there are fifteen incorporated cities in the watershed.

## **Mechanism for Intergovernmental Coordination**

This plan does not establish a joint powers group of any kind. Under the leadership of Oregon DEQ, it requires local agencies to use their existing authorities to meet the planning goals. Local management agencies and DEQ do meet on a regular basis to discuss progress. A new compliance schedule is currently being negotiated with the state and local agencies involved in implementation of NPS control plans. The schedule includes specific tasks for all agencies and encourages them to work cooperatively.

## **Sources of Funding and Budget Information**

Funding for the Unified Sewerage Agency program would come from fees imposed upon rate payers in its service area. USA estimates that its budget needs are at least \$4.9 million. The Department of Forestry has allocated \$34,600 to its monitoring program, while the animal waste control program for the special hydrologic unit area of Dairy Creek/McKay Creek has \$4.2 million set aside over five years. The federal Water Quality Incentive Program has brought in an additional \$280,000 into the area over two years.

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## **Management**

### **Organizational Structure**

The plans are prepared under DEQ administrative rules set out in OAR 341-40-470. Designated Management Agencies have responsibility for developing and implementing plans to improve water quality in the watershed. Unified Sewerage Agency and Washington, Clackamas, and Multnomah Counties each were assigned pollution cleanup and control projects under the plan.

### **Types of Authority**

Regulatory authorities at work in this plan include the powers to upgrade wastewater treatment facilities and land use authorities for controlling soil erosion and runoff at construction sites. DEQ issues NPDES permits for treatment plants and urban stormwater. The Forest Practices Act controls forest harvest activities on state and

private forest land. DEQ also maintains controls for confined animal feeding operations and container nursery operations.

### **Management Techniques**

The Department has established TMDLs and load allocations to address dissolved oxygen, nitrogen ammonia, phosphorus, and chlorophyll-a active level. The USA and the City of Portland are making changes to their wastewater facilities as the first step.

The Soil Conservation Service, Department of Forestry and the Agricultural Conservation and Stabilization Service have initiated a voluntary program to control agricultural and forestry discharges for the Dairy Creek/McKay Creek Hydrologic Unit Area, about 165,000 acres. Fifteen of the estimated seventy farms are presently participating. The emphasis is on fertilizer and animal waste controls.

The municipalities have enacted bans on detergents containing phosphate and have tightened controls on soil erosion from construction sites.

Rules stipulate that if voluntary programs and the wastewater facility upgrades do not resolve the water quality problems, DEQ may enact regulations to govern farm and forestry operations, and urban uses.

Generally, the plan follows the state's Forest Practices Rules and Implementation Guidelines, SCS Technical Manual, Surface Water Quality Facilities Technical Guidance Handbook, and EPA's Coastal Nonpoint Pollution Control Program Guidance.

### **Enforcement Mechanisms**

This program operates under its existing authorities without separate authorization by the legislature. As such, those authorities each have established enforcement mechanisms to assure the program is carried out by the public.

### **Monitoring System**

The DEQ, USA and the City of Portland are working jointly to monitor water quality at many sites throughout the river basin. The Oregon Department of Forestry has initiated an enhanced monitoring program for the Tualatin watershed for the 1991-1993 biennium. The program will monitor at seventeen sites chosen specifically to assess phosphorus loading caused by forest management practices.

### **How Long Has the Plan of Management Been in Force?**

The program went into effect in February 1990.

### **Representative Projects**

Representative projects include the wastewater treatment facility upgrades, the Department of Forestry monitoring program, and the USDA SCS agricultural BMP program.

### **Grassroots Involvement**

The Critical Basin Program exists in part due to litigation by environmental organizations in the Northwest to force the states to improve their efforts to implement the provisions of the Clean Water Act. USA formed a Citizens Advisory Committee to assist in preparing its plan. Environmentalists, community planning organizations, and developers participated. Presentations were made to many community interest groups, and a public hearing was held to receive public comment.

### **Program Benefits Identified to Date**

Wastewater treatment facility upgrades are due to be completed by June 30, 1993. Local governments have placed a ban on detergents containing phosphate. Stricter erosion control standards for construction sites have been enacted.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

EPA funding under section 2059j) was obtained to conduct the watershed assessment. EPA Region X provided technical assistance for development of the TMDLs, WLAs, and Las. Region X has provided funding through section 319(h) for implementation of NPS control programs and effectiveness monitoring. The Department reports that the program could not have been established without the technical and financial support of US EPA.

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## **Sources**

### **Key Enabling and Governance Documents**

Oregon Administrative Rules, Chapter 340, Division 41, Department of Environmental Quality. Special Policies and Guidelines for the Tualatin River subbasin, 341-40-470. 1988.

### **Watershed Management Documents**

Portland's Tualatin Basin Water Quality Management Plan. City of Portland. February 1990.

Surface Water Management Plan. Unified Sewerage Agency of Washington County. February 1990.

Nonpoint Source Watershed Management Plan Development Guidance. Oregon Department of Environmental Quality. November 15, 1990.

Proposal: A Watershed Management Strategy for Oregon. Summary Report of the Strategic Water Management Group. State of Oregon. August 11, 1992.

Tualatin River Watershed Management Plan for Controlling Rural Nonpoint Source Pollution. March 1991.

Lower Tualatin River Oswego Lake Subbasins Nonpoint Source Management, Clackamas County and River Grove. March 1990.

Multnomah County. Tualatin River Basin Nonpoint Source Control Watershed Management Plan. January 1992.

Oregon Department of Forestry. Nonpoint Source Water Quality Management Plan for the Tualatin River Basin.

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**Upper Delaware Scenic and Recreational River, NY & PA**

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**Notes:**

The Upper Delaware is a component of the National Wild and Scenic Rivers System. A large area, it is almost all in private property and relies for its success on the successful use of local planning and zoning functions. Standards for the river corridor are based heavily on the prevention of nonpoint sources of pollution and erosion control.

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**Year and Method of Establishment**

The Upper Delaware Scenic and Recreational River was designated for study by Congress when it enacted the National Wild and Scenic Rivers Act in 1968. It was designated as a component of the System in 1978. The Final River Management Plan, which governs management of the corridor, was approved and went on line in January 1988.

Within the context of overall management of river flows in the Delaware River Basin, the river was designated to protect it as a source of water supply for human and industrial uses, fish and wildlife purposes, and environmental purposes in downstream areas. Flows from the Upper Delaware have generally excellent water quality, and the plan and overall management of the basin by the Delaware River Basin Commission seeks to protect that quality. The headwaters of the Delaware are a major source of drinking water for New York City. Downstream users include New Jersey and Philadelphia suburbs

**Mission Statement/Strategic Focus**

The primary goal in protecting any river as a component of the National Wild and Scenic Rivers System is to protect rivers and their immediate environments that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values for the benefit and enjoyment of present and future

generations. These rivers are to be preserved in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

Relevant to water quality, this purpose is carried out by pursuing a management policy of nondegradation. The Wild and Scenic Rivers Act assumes in its language that other federal laws governing water quality will be implemented, thus protecting water quality. However, the management plan for the Upper Delaware recognizes that the river's water quality is one of the outstandingly remarkable characteristics, further focusing management actions on the protection of this characteristic. Surveys indicate that the need to protect water quality in the river is one of the most widely shared beliefs among the people who own property in or visit the area.

### **Geographic Scale**

The Upper Delaware River is the 73.4-mile segment of the Delaware River that forms the north-south between Pennsylvania and New York. It encompasses parts of three New York and two Pennsylvania counties, eight New York towns and seven Pennsylvania townships. The corridor, the largest per mile of any component of the National Wild and Scenic Rivers System, is 55,575 acres.

### **Mechanism for Intergovernmental Coordination**

The plan provided for the formation of the Upper Delaware Council, a nonprofit corporation, the members of which are the state and regional agencies and units of local government that are responsible for implementation of the plan. Participation is arranged through two instruments, the bylaws governing membership in the Council, and the cooperative agreement between the National Park Service and the Council that provides for coordinated implementation of the plan. Members of the Council commit to implementing their part of the plan and to take actions consistent with it.

Agencies and units of government eligible for membership are those that are directly affected by implementation of the plan. At present, three Pennsylvania townships, eight New York towns, the Commonwealth of Pennsylvania, the State of New York, and the DRBC are members of the Council. The DRBC participates in a non-voting capacity. The Citizens Advisory Committee participates as a special observer since it has neither legal status nor implementing authority. The NPS, as the federal party in the cooperative agreement, is not a member in the Council but agrees contractually to be a full partner in Council programs and to be consistent with the plan.

### **Sources of Funding and Budget Information**

The Upper Delaware Council is funded by Congress via a line item in the budget of the National Park Service for the Upper Delaware Scenic and Recreational River. Funding has been \$300,000 annually. As a nonprofit corporation, the Council has been eligible to receive grants and donations from foundations, government agencies, and the general

public. Funding in this area has been received, but it is not relevant to nonpoint source pollution. Financial commitments by DRBC and NPS for nonpoint source control and monitoring systems is not available.

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## Management

### Organizational Structure

The plan divides responsibilities according to the legal capabilities of each of the partners. For instance, NPS manages riverine recreation, while the states manage fish and wildlife. The DRBC manages Delaware River water quality (but not the tributaries—those are the domain of the states), and the municipalities handle zoning. The Council, operating with its own staff, coordinates the efforts, facilitates communication, handles permit reviews, and acts as watchdog over all the agencies.

### Types of Authority

Although the Upper Delaware Council is a coordinating body, it can be quite influential. As an advocate for the people and resources of the river corridor, it can speak out on and review any program or project proposals that may affect the river valley. For instance, speaking in a unified voice on matters related to the management of water resources, the Council can have impact on major decisions that may affect the area.

Management authorities are designed to accomplish two primary objectives: maintain or enhance the outstandingly remarkable resources and values of the river corridor, including its free-flowing nature, and to prevent incompatible uses ("clear and direct threats") of the corridor's land and resources. To this end, the Council uses:

- Local zoning
- Reviews of permit applications for significant projects requiring DRBC, federal or state approval
- Reviews of challenges, variances, and other legal and procedural changes to local land use standards
- Recreation and cultural resources management actions by the National Park Service
- Land acquisition (as a last resort) by the National Park Service
- State permitting and management for forest and game lands; water quality and water resources management; controls of toxic or hazardous substances; fish and wildlife management; the management of historical, cultural and archeological resources; recreation management; landfill controls; and similar programs.
- Water resources permitting by the DRBC



## Management Techniques

The control of nonpoint sources of pollution is based in the Land and Water Use Guidelines. Among the standards imposed are the following:

- Limit soil erosion and sedimentation from construction on steep slopes by requiring conditional use reviews or a Professional Engineer's Plan for projects involving slopes over 15%, or requiring slopes of less than 16% for all principal structures
- Maintain natural cover to control stormwater runoff, limit flooding, protect groundwater supplies and provide erosion control by limiting impervious service cover to 10% maximum lot coverage; limiting clearing for construction to 20% of the lot area or 10% involving slopes greater than 15%
- Protect special erosion hazard areas along river banks by requiring setbacks consist with State required setbacks of septic systems (100 feet in NY, 50 feet in PA)
- Protect special erosion hazard areas along the ridge lines by requiring a setback of 100 feet from mapped ridge line areas
- Limit pollution problems from septic systems by requiring a lot size of two acres or more outside hamlets (designated growth areas)
- Prohibit intensive livestock operations with the river corridor
- Prohibit clearcuts over two acres in size or make them conditional uses
- Develop local law provisions requiring soil stabilization and setting other performance standards
- Prohibit large scale groundwater withdrawals
- Prohibit stream channelization
- Encourage the use of clustering techniques to reduce lot sizes and maximize open space and stream buffer zones
- Prohibit junkyards, subsurface mining, major surface mining, impoundments, channel modifications, landfills, and similar uses

## Enforcement Mechanisms

The Council relies on the residual authorities of its members for enforcement. By becoming a member of the Council, the member agrees to active consistently with the river management plan. Municipalities amend and upgrade local ordinances and plans. The states adopt executive orders that order all relevant state agencies to act consistently with the plan. The DRBC builds the applicable portions of the river management plan into its Comprehensive Coordinated Joint Plan. These consistency agreements assure the enforceability of the plan.

One of the Council's primary functions is that of project review. All permit applications for actions in or directly affecting the river corridor come before the Council for review.

Proposals must be in substantial conformance with the plan and guidelines. While the Council does not have the authority to approve or disapprove projects, reviews are successful in heading off potential problems.

If a town grants a permit for an incompatible use or a developer persists in continuing an incompatible use, provisions in the plan set out a process to resolve the problem, or, if necessary, to institute action by the National Park Service to take the property through eminent domain. No permit in five years of operation has warranted such action. One of the Council's chief accomplishments is that the process it convenes is successful at resolving issues before they become problems.

### **Monitoring System**

The DRBC and the National Park Service jointly conduct water quality monitoring in the river corridor. The Upper Delaware Council monitors develop permit applications through its project review process and through its resource management process.

### **How Long Has the Plan of Management Been in Force?**

The management plan took effect January 4, 1988. Interim protections took effect upon designation of the river by Congress on November 10, 1978.

### **Representative Projects**

Representative projects for water quality include the DRBC-NPS monitoring system, the upgrades in water quality standards, and the local zoning program.

### **Grassroots Involvement**

The special legislative provisions for the Upper Delaware set forth a standard for "participation in the development of the said general guidelines by all levels of States, county, and local governments, and concerned private individuals and organizations."

The planning process used a task force approach that included fifty-four agencies and organizations and over 100 individual representatives. The planning process used open sessions, public informational meetings and hearings, key person interviews, landowner and user surveys, and many other techniques to elicit public involvement.

Both the Upper Delaware Council and the National Park Service maintain active grassroots involvement programs. NPS operates an active media program designed to increase awareness about NPS programs and management initiatives. Its primary vehicle for citizen involvement is the Citizens Advisory Committee, created pursuant to the special legislative provisions for the Upper Delaware. This committee operates under the auspices of the Federal Advisory Committee Act.

The Council publishes a newsletter distributed to over 16,000 residents and readers quarterly. The Council recruits volunteers with special expertise to participate as advisory members on Council management oversight committees, and it has established a Friends of the Upper Delaware program to encourage hands-on volunteerism in the corridor. Current Friends programs include a Green Watch program, Adopt-A-Highway, Adopt-A-Stream, and a Save Our Streams-oriented water quality monitoring program.

### **Program Benefits Identified to Date**

In the area of water quality protection, several program benefits have accrued since the plan took effect. The DRBC recently moved to upgrade water quality standards in the upper basin to match the water quality presently existing in the river. Major standards rose by 30 to 70 percent. This is consistent with the policy of nondegradation.

The DRBC has also established a water quality monitoring system for the river in conjunction with the National Park Service.

Eight of the fifteen towns have upgraded or enacted zoning and land use ordinances to bring them into substantial conformance with the river management plan's Land and Water Use Guidelines. These ordinances contribute to the overall framework for the protection of the river's water quality and prevention of nonpoint sources of water pollution.

### **Assistance Provided by US EPA; Assessment of Value of the Assistance**

US EPA is providing Section 319 funds to Sullivan County, New York, and Wayne County, Pennsylvania, for the completion of stormwater management plans for Upper Delaware tributaries. Other than that, US EPA has not been party to studies or management activities in the Upper Delaware corridor area.

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## **Sources**

### **Key Enabling and Governance Documents**

National Wild and Scenic Rivers Act, Public Law 90-542, 82 Stat. 906, as amended. October 2, 1968.

National Parks and Recreation Act, Public Law 95-625, 92 Stat. 3533, November 10, 1978.

National Wild and Scenic Rivers System; Final Revised Guidelines for Eligibility, Classification and Management of River Areas; Federal Register, September 7, 1982.

## **Watershed Management Documents**

**Final River Management Plan, Upper Delaware Scenic and Recreational River, New York and Pennsylvania, Prepared by the Conference of Upper Delaware Townships in cooperation with the National Park Service, November 1986.**

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## Watershed Committee of the Ozarks, MO

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### Year and Method of Establishment

The predecessor to the Watershed Committee of the Ozarks (WCO) was founded in 1984 as the Watershed Management Coordinating Committee. It in turn was the creation of a Watershed Task Force formed in 1983 to assess the current status of, and potential threats to, metropolitan Springfield's water supply. A proposal to locate a large residential subdivision immediately upstream of the city's two drinking water reservoirs was the immediate cause for concern, especially since these homes would be serviced by septic systems which might potentially foul water supplies. The community was also concerned about other land development proposals within the water supply drainages. The Task Force worked for ten months to prepare a set of recommendations to protect water quality in general, and water supply in particular.

The Task Force found that the community was fortunate that most urban development had located downstream of the reservoirs, but that identified development pressures and changes in agricultural use would threaten the water supply. It found that septic systems, historically the system of choice for waste management, was poorly suited to the karst terrain found throughout the study area.

The Task Force recommended that watershed management practices should begin before water quality is degraded below acceptable levels and before extensive development takes place. The group saw watershed management as a preventative practice—not a cure, as a continuing process that yields long term rather than short term results, and that is multi-jurisdictional in nature.

The group wanted the program to focus on (1) planning and coordinating authority; (2) regulatory authority; (3) monitoring; (4) technical assistance; (5) selective acquisition

of land or interests in land; (6) capital improvements programming; (7) enforcement; (8) operation and maintenance facilities; and (9) public information and education.

The Task Force also recommended the formation of a coordinating body to oversee implementation of a joint plan and to ensure its success. This was the Watershed Management Coordinating Committee. In 1987, this Committee incorporated and became the Watershed Committee of the Ozarks.

### **Mission Statement/Strategic Focus**

The goal of the program is to protect the drinking water supply for the Springfield community.

### **Geographic Scale**

The WCO addresses the watersheds of the Springfield community and its water supply sources.

### **Mechanism for Intergovernmental Coordination**

The WCO is a coordinating body with representatives from the City, County, utilities, and the public. It operates as a nonprofit 501(c)(3) organization. This entity was set up specifically not to become "another layer of government". Its operation depends on maintaining the good will of its founding members. No other specific mechanisms exist.

### **Sources of Funding and Budget Information**

The organization is funded by the local governments and utilities in its membership. In addition, as a 501(c)(3) organization, it can receive foundation and government grants and other sources of revenue. It has also received funding from US EPA for several programs. Its largest project was the development of a GIS for the watershed at a total cost of \$325,000. The City, County, Utilities, and US EPA were joined by the US Geological Survey in funding the program.

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## **Management**

### **Organizational Structure**

The Board of the WCO has six members: one representing the Greene County Commissioners, one representing the City of Springfield, one representing the City Utilities of Springfield, and three representing the public at-large. Formerly, members from Greene County, Springfield and the utilities were employees or elected officials.

These entities now send non-governmental members to the Board to increase its focus as a citizen's organization.

### **Types of Authority**

The WCO has no statutory authority to regulate or review and approve powers over watershed-affected decisions. Its functions are to educate, review, recommend, coordinate, monitor, and research.

The WCO reviews zoning cases, plats, and development proposals in the watershed areas, with recommendations forwarded to the City and County Planning Departments. Typically, there are 15-30 major reviews per year. The WCO reviews building codes, zoning ordinances, and subdivision regulations to assure their consistency with watershed management standards. The WCO also reviews major policy and regulatory proposals from state and federal agencies that may affect the watersheds and makes recommendations to the appropriate bodies, facilitates coordination, or provides other assistance as may be useful.

On paper, the WCO appears to be a citizen's group operating in an advisory capacity. However, because its founding members are agencies, the organization can operate effectively as a quasi-governmental body, and it will take on public credibility as it operates credibly within that construct.

### **Management Techniques**

The WCO has no direct management techniques, aside from securing consistent action from the City, County, and utilities. Its other major technique is a strong educational program. Additionally, it enters into many projects with agencies such as Missouri DNR, the local Agricultural Stabilization and Conservation Service, the University of Missouri Extension, the USDA Soil Conservation Service, US EPA, the US Geological Survey, area universities, and local governments. It uses influence and prestige to secure participation and the implementation of successful projects.

### **Enforcement Mechanisms**

The WCO relies on its position as a quasi-governmental body to secure consistent actions by its city and county members and by the utilities.

### **Monitoring System**

Among the monitoring projects the WCO has in place are the GIS system to monitor land and water use changes, the Fullbright Spring Monitoring System, the McDaniels/Fellows Lakes 319 project, and the Pearson Creek Stormwater Sampling Project.

## **How Long Has the Plan of Management Been in Force?**

The plan of management went into effect in 1984.

## **Representative Projects**

The WCO has coordinated development of a GIS for the region, sponsored a spring monitoring project, participated in a 319 project, does project reviews, coordinates several stream monitoring programs, publishes a newsletter, sponsors an annual conference, produced a multi-media program, distributes water test kits to schools, produced public service announcements, published geologic maps, instituted a sign program, and produces informative fact sheets and other publications.

## **Grassroots Involvement**

The WCO Board membership has three at-large members from the community and three non-governmental representatives from the City, County, and utilities. The program combines the planning and review aspects of a quasi-governmental body with the citizens advocacy enthusiasm of a grassroots organization. The WCO seeks major public involvement in its stream monitoring programs, and it places a strong emphasis on public education.

## **Program Benefits Identified to Date**

No data available.

## **Assistance Provided by US EPA; Assessment of Value of the Assistance**

EPA has partially funded the development of the regional GIS, the Fullbright Spring Monitoring System Project, and, through Missouri DNR, a 319 grant for the McDaniels/Fellows Lake project. The latter is oriented toward the control of agricultural runoff and on-site wastewater systems.

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## **Sources**

### **Key Enabling and Governance Documents**

Ten Year Portfolio 1984-1994. Discussion Draft. Watershed Committee of the Ozarks. Springfield, Missouri. 1992.



## **Watershed Management Documents**

Report of the Watershed Task Force. City Utilities of Springfield, City of Springfield, Greene County. Springfield, Missouri. 1983.