United States Environmental Protection Agency

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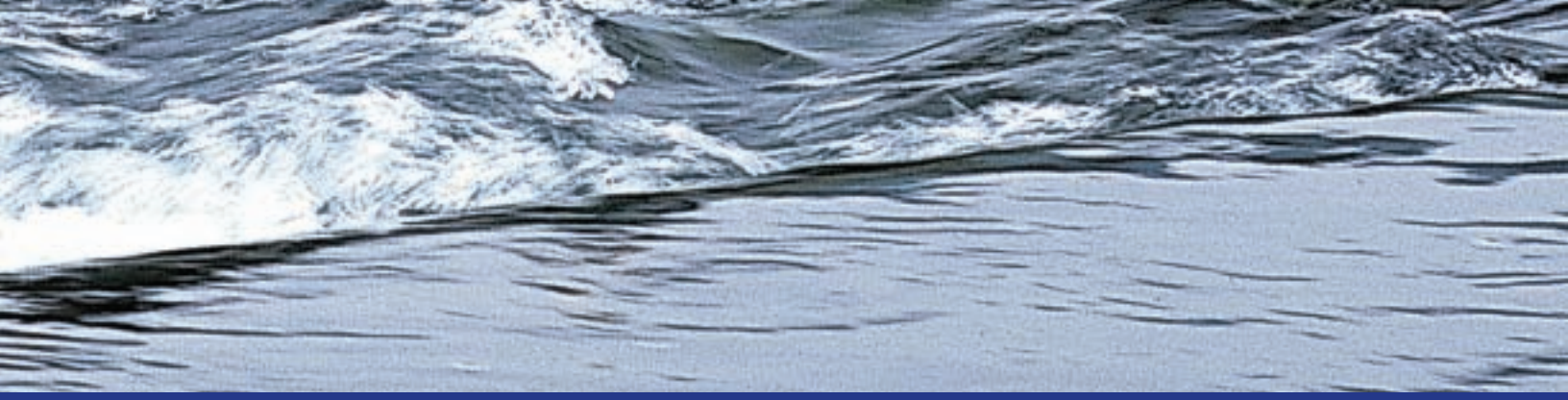
EPA'S TARGETED WATERSHED GRANTS 2005 ANNUAL REPORT

2004 Grantees

December 2005

2004 Grantees



- Bear River
- Cape Fear River
- Dungeness River
- Fourche Creek
- Ipswich River
- Kalamazoo River
- Kenai River
- Lake Tahoe
- Nashua River
- Passaic River
- Schuylkill River
- Siuslaw River
- Upper Mississippi River
- Upper Sangamon River

Bear River

UT, ID, WY

WHY IS THIS WATERSHED SPECIAL?

The 7,500-square-mile Bear River watershed begins in the high country of Utah and flows north and west through southwest Wyoming and southeast Idaho. After abruptly turning to the south, the Bear River returns to Utah and eventually ends its journey as the largest tributary of the Great Salt Lake. The Conservation Corridor connecting the northern and southern Rockies is a critical pathway for migratory birds. Surrounded by arid desert lands, the Bear River marshes provide for an abundance of bird life with over 200 waterfowl and other bird species. Currently, 52 streams and nine lakes are listed as being impaired in the three states of the watershed.

ENVIRONMENTAL CHALLENGES

Water quality management is compounded by the transboundary nature of the river, which meanders through three states and two EPA regions with multiple jurisdictions and planning authorities.

- Water quality problems include sediment, nutrients, fecal coliform bacteria, low dissolved oxygen, and high water temperature.
- Pollutant sources include animal feeding operations, grazing, agriculture, wastewater treatment, degraded stream banks, urban development, roads, phosphate mining, oil and gas exploration, and logging.

A late summer sunrise over the Bear Lake Marina. Bear Lake is the recreational gem of the watershed and provides opportunities from boating and camping to ice fishing.

RESTORATION ACTIVITIES

The Bear River Commission will use grant funds to develop and demonstrate:

- An integrated Watershed Information System (WIS)—www.bearriverinfo.org—to facilitate "one stop shopping" for data collection, data analysis, information transfer, and public outreach
- A water quality trading program to allow point and nonpoint pollutant sources to trade water quality credits
- Dynamic water quality modeling to support water quality trading and analysis of potential water quality management scenarios

Project participants examine a restoration site.

A STRONG PARTNERSHIP FOR CHANGE

The Bear River Commission is working with the Bear River Water Quality Steering Committee, a group composed of the water quality agency specialists from Utah, Idaho, and Wyoming. The project has broad-based participation from many partners, including:

- Utah, Idaho, and Wyoming Departments of Environmental Quality
- Bear River Commission
- Bear Lake Regional Committee
- Bear Lake Watch
- Utah State University
- Utah Water Research Laboratory
- Bear River Water Quality Task Force

Project personnel scope out potential sites for real time streamflow and water quality monitoring.

"The Bear River Watershed Information System is providing unprecedented access to data in the Bear River Basin."

– Jeff Horsburgh, Utah Water Research Laboratory, Utah State University, a Project Leader

Targeted Watersheds

Cape Fear River

NC

WHY IS THIS WATERSHED SPECIAL?

The Cape Fear River watershed, North Carolina's largest, includes 23 percent of the state's land area and many of the state's most actively growing urban areas. Home to 27 percent of the state's population, the area supports jobs in a variety of industries, including both manufacturing and agriculture. Almost 300 point source dischargers share the basin with more than five million head of swine. Growth rates currently exceed the statewide average and water usage within the basin is expected to increase nearly 95 percent by 2020.

ENVIRONMENTAL CHALLENGES

- Twenty percent of the basin's waters are impaired.
- Jordan Lake experiences eutrophication due to nutrient enrichment. Excess nutrients are also a concern all along the river and may contribute to the low dissolved oxygen in the estuary.
- Continued economic growth can potentially cause a variety of problems associated with urban and suburban development, such as erosion and nonpoint source pollution. Accordingly, communities are challenged with striking a balance between strengthening stormwater management requirements and supporting economically beneficial growth.

A farmer discusses a new animal waste management system that will help reduce nutrient runoff. (Bob Nichols)

RESTORATION ACTIVITIES

The Cape Fear River Assembly will launch a water quality trading program in the Jordan Lake watershed of the Upper Cape Fear River Basin. Specifically, they will:

- Design a trading program that will identify pollution control responsibilities, control options, types of management practices that should be considered for defining credits, and protocols for debiting and crediting transactions
- Examine combining traditional land management practices with nonstructural management practices, such as land banking, riparian buffers, and wetland restoration
- Create economic incentives for developers to adopt conservation development techniques such as low impact development, clustering, and other approaches that preserve open space and provide more permeable surfaces

A STRONG PARTNERSHIP FOR CHANGE

Formed in 1973, the Cape Fear River Assembly is a nonprofit organization governed by a 39-member board of directors with equal representation from industry, agriculture, public utilities, elected officials, and environmental and conservation interests. They are further supported in this project by six organizations:

- Upper Cape Fear River Basin Association
- Middle Cape Fear River Basin Association
- Sampson County Friends of Agriculture
- Fayetteville Public Works Commission
- Yarborough Law Firm
- Lower Cape Fear River Program

Sunset at the entrance to the Cape Fear River. (Capt. Albert E. Theberge, NOAA Corps (Ret.)

"Watersheds are waters shared, a shared resource and a shared responsibility. Accordingly, this resource can be best managed as a team effort. If the rivers were the circulatory system in the body called North Carolina, then the Cape Fear River system would be the coronary artery."

– Don Freeman, Cape Fear River Assembly

Dungeness River

WA

WHY IS THIS WATERSHED SPECIAL?

The Dungeness River of Washington State, located on the Olympic Peninsula of northern Puget Sound, originates in the steep Olympic Mountains and flows 32 miles through wilderness, forest, and valley before reaching its bay. The 200-square-mile watershed is home to more than 200 fish and wildlife species and an important stop for migratory waterfowl. The river supports seven salmonid species, and the bay is noted for bountiful crab and other shellfish. Over the years, the area has been steadily converted from forest to agricultural and residential land uses. An extensive irrigation system, diverting water for lawns, crops, and hobby farms, adds to the pastoral setting of the valley. The Jamestown S'Klallam Tribe, which has historically depended on the watershed's cultural and natural resources, retains treaty rights to fish, hunt, and gather shellfish here.

Aerial photos of the Dungeness watershed.

ENVIRONMENTAL CHALLENGES

Human-induced impacts have impaired the natural river and bay processes of the Dungeness. The combination of watershed health problems has resulted in human risk, three threatened salmonid species under the Endangered Species Act, and closure of Dungeness Bay to tribal and nontribal shellfish harvests, inhibiting economic and recreational use of the river and bay. The river has also been placed on the state's §303(d) water quality list for fecal coliform and low instream flows.

- Land use changes and physical alterations – such as floodplain development, riparian vegetation removal, and construction of an extensive irrigation system – are factors in flooding, stormwater pollution, and overall degraded aquatic habitat.
- Failing septic systems, poor animal keeping practices, and inadequate management of stormwater runoff have increased nutrient and bacterial levels in the river, bay, and irrigation ditches.

RESTORATION ACTIVITIES

The Jamestown S'Klallam Tribe will use its Targeted Watersheds grant in two areas. The first is to apply microbial source tracking technologies to at least six sites to more precisely define bacterial pollutant sources. The second is to institute four pollution prevention techniques.

- A bio-remediation project will use native fungi to control excess nutrients and bacteria.
- A homeowner sewage management program will provide education and cost-sharing incentives in septic maintenance and repair.
- A stormwater management project will focus on best management practices for homes, roadsides, and parking lots.
- An irrigation ditch piping project will prevent pollutants from entering the irrigation system (by joining ditches and enclosing them in pipe) and improve in-streams flows (by eliminating leakage and reducing the amount of flow diverted from the river for irrigation).

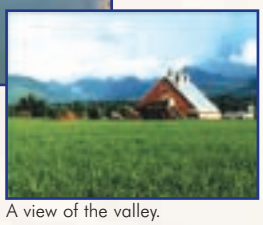
A STRONG PARTNERSHIP FOR CHANGE

The Jamestown S'Klallam Tribe is leading an interjurisdictional partnership consisting of:

- Jamestown S'Klallam Tribe
- Clallam County
- Clallam Conservation District
- Cline Irrigation District, Clallam Ditch Company and Dungeness Irrigation Group
- The Dungeness River Audubon Center
- Battelle Marine Science Laboratory

Scenic image of the river from the south.

Aerial view of the Bay.



A view of the valley.

"The cooperative efforts of the tribe and our project partners have been key to understanding the water quality problems in the Dungeness watershed. Integrating our water quality improvement projects will help to restore our watershed's health."

– W. Ron Allen, Tribal Chairman/Executive Director, Jamestown S'Klallam Tribe

Targeted Watersheds

Fourche Creek

AR

WHY IS THIS WATERSHED SPECIAL?

The Fourche Creek watershed in Arkansas drains and filters over 99 percent of the Little Rock metropolitan area and encompasses at least six third-order streams and numerous tributaries that discharge into it. The creek catches, stores, and releases floodwater from the Little Rock area. A classic urban watershed, the City of Little Rock cites the economic value and savings from natural purification in the Fourche Bottomlands to be in the millions of dollars. However, despite decades of neglect and abuse, Fourche Creek still boasts more than 50 species of fish, stands of 300-year-old bald cypress, and core bottomland region that still maintains its wetland functions. An estimated 90,000 of the watershed's 108,000 acres lie within the city limits of Little Rock, and of those, approximately 2,000 are intact wetlands. The core intact wetland area of Fourche Creek remains undeveloped, but is surrounded by encroaching commercial and industrial sites and crisscrossed by utility corridors.

ENVIRONMENTAL CHALLENGES

In 2003, Fourche Creek was identified by EPA as a federal priority with its Brownfield designation. The greatest threats to the Fourche watershed include sedimentation and floodplain encroachment:

- Streambank erosion and stormwater runoff problems exist due to development and urban sprawl.
- Dwindling wetland habitats and floodwater storage capacity threaten the watershed's ability to act as a natural filter.

Students learn water quality monitoring techniques.

RESTORATION ACTIVITIES

As the largest urban environmental restoration project ever undertaken in Arkansas, the Targeted Watersheds Grant funds will allow Audubon Arkansas to improve water quality, restore wetland functions, and enhance educational opportunities and community awareness. The project has six primary goals:

- Revitalizing wetland function by stabilizing 4,500 linear feet of rock vane and crib wall; reforesting 50 acres; enhancing 4,500 linear feet of stream corridor; establishing six stormwater retention basins; reducing sediments by five percent, plus facilitating one large-scale stream restoration project
- Increasing habitat and wetland floodwater storage capacity by bringing 20 critical acres of stream corridors in the floodplain into perpetual conservation easement status
- Establishing education and watershed awareness programs for the public, including students and developers
- Reducing floatable trash by 20 percent through a partnership with the City of Little Rock and a Central Arkansas waste management firm, which has agreed to accept free of charge all litter collected in the watershed, as well as build a trash collection device across the main stem of the creek
- Using the project web site, www.fourchecreek.org, as a center for outreach and communication
- Continuing to conduct monthly water quality sampling at eight sites along Fourche Creek for more than 40 parameters

A STRONG PARTNERSHIP FOR CHANGE

Audubon's broad array of partners includes:

- State, county, and local level public partners such as Arkansas Forestry Commission, City of Little Rock, and Pulaski County Conservation District
- Private partners such as Sierra Club, Central Arkansas Chapter of Audubon Society, and the Ross Foundation
- Other supporting groups such as Boy Scouts of America, US Army Corps of Engineers, Natural Resource Conservation Service

Interns learn about wetland and forest habitats.

A project goal is to reduce floatable trash by 20 percent.

"The Fourche Creek float was an experience I never thought I would have in the heart of Little Rock. The ancient trees, the shade, the winding stream channels, and the flash of birds: green heron, great horned owl, and Mississippi kites. I would never have known about it had I not been involved with Audubon."

– David Stafford, Sturgis Scholar UALR

Targeted Watersheds

Ipswich River

MA

WHY IS THIS WATERSHED SPECIAL?

The Ipswich River winds 45 miles from northeast Massachusetts to the Atlantic Ocean, where it becomes part of the 17,000-acre Great Marsh estuary ecosystem. The 155-square-mile watershed encompasses all or part of 22 communities and is a critical source of drinking water for over 330,000 residents and businesses. The river has been an economic and ecological asset within the area since before colonial times, supporting productive fisheries and shellfish beds, and, for more than a hundred years, it supported shipbuilding, tanneries, and textile mills.

ENVIRONMENTAL CHALLENGES

The Ipswich River was designated by American Rivers as the third most endangered river in the nation because of its extremely low flows and extended periods of no flow.

- Eighty percent of the water pumped from the river and the aquifers within the watershed is shipped out of the basin as drinking water or wastewater, creating a large new outflow.
- Additionally, increasing areas of impervious surface from development cause flooding and erosion, degrade water quality, and prevent natural recharge to aquifers within the watershed.
- Low flows and increased nonpoint source pollution result in extremely low dissolved oxygen, high temperature, algal blooms, elevated nutrients and pathogens.
- Low and no-flow events and degraded water quality have led to repeated fish kills and near full replacement of river-dependent fish species with species associated with ponds and still water.

Marilyn McCrory of MA Department of Conservation and Recreation (foreground) during a site tour with EPA and the Ipswich River Watershed Association. (Sandra Fancieullo)

RESTORATION ACTIVITIES

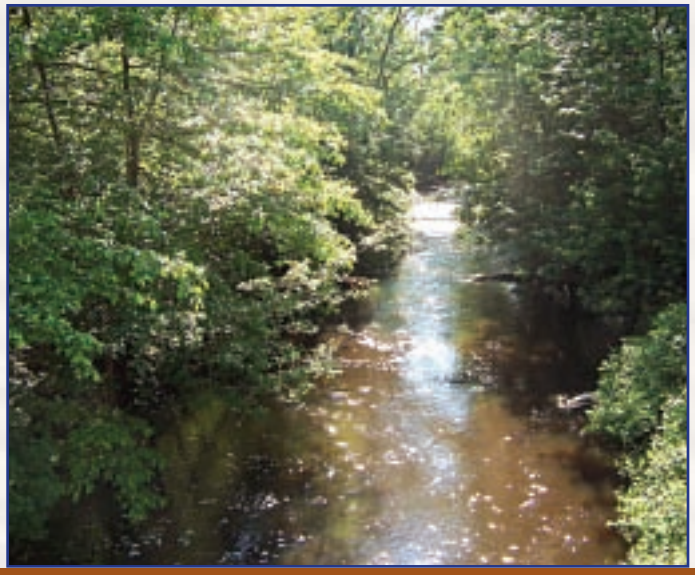
The Massachusetts Department of Conservation and Recreation will use its watersheds grant to address the impacts caused by extensive pumping for municipal water supply and land development. The project will:

- Quantify the benefit of specific low-cost, natural stormwater infiltration and recharge techniques, and water conservation techniques
- Quantify the potential impact of these techniques on a watershed-wide scale, through modeling
- Form the basis for local "water banks," and provide essential information to regulators to employ incentive-based trading mechanisms within permitting programs

A STRONG PARTNERSHIP FOR CHANGE

The Massachusetts Department of Conservation and Recreation is supported in its project through the collaborative efforts of several groups:

- The Ipswich River communities of Reading, Wilmington, North Reading, and Topsfield
- The Ipswich River Watershed Association
- Rainwater Recovery Systems, LLC
- AquaSave
- The U.S. Geological Survey



View of Ipswich River from bridge. (Sandra Fancieullo)

"With many projects up and running, monitoring underway, and awareness and interest in what we're doing growing within the watershed, I feel very hopeful about advancing the understanding of and adoption of low-impact development and water conservation techniques, with noticeable benefits to the Ipswich River."

– Sara Cohen, Department of Conservation and Recreation, Grant Project Manager

Targeted Watersheds

Kalamazoo River

MI

WHY IS THIS WATERSHED SPECIAL?

The 2,020-square-mile Kalamazoo River watershed in southwest Lower Michigan supports a population of nearly 500,000 and is comprised of 41 percent forest and rural open areas, 45 percent agriculture, seven percent urban, and seven percent open water and wetlands. Historically, the 160-mile river has been used as a fishery and for extensive paper milling. Significant ecological, cultural, and spiritual interests link the Match-E-Be-Nash-She-Wish Band of the Pottawatomi (the Gun Lake Tribe) to this basin. The current City of Kalamazoo was the center of the tribe's dedicated homelands until the mid-1800s. The tribe maintains existing and ceded lands within the watershed.

ENVIRONMENTAL CHALLENGES

From a once-prized small-mouth fishery to an oxygen-starved, milky-white receiving stream for mill waste, the river now meets most ambient water quality standards. Significant water quality challenges remain:

- Eighty miles of the river are still plagued with PCB-laden sediments from the paper mill legacy, resulting in fish consumption advisories
- Other select areas are impaired by nonpoint source runoff, nutrient enrichment, and habitat loss
- Lake Allegan – a 1,500-acre impoundment 21 miles upstream of Lake Michigan in the lower reaches of the watershed – suffers from phosphorus over-enrichment and the attendant frequent algal blooms, low oxygen levels, and poor water clarity

Lake Allegan is a beautiful lake, but the water is heavily nutrient enriched and affected by PCBs.

RESTORATION ACTIVITIES

The tribe is involved in this effort by addressing eutrophication issues through trading in two phases:

- Developing a model trading infrastructure and applying mechanisms to include both market-based tools, and a model trading registry
- Developing a transferable model trading framework for agricultural participation, phosphorus credit banking, education and implementation of conservation practices for trading

Both aspects of the project will be tested and verified with real reductions through agricultural participation and other partners.

A STRONG PARTNERSHIP FOR CHANGE

More than 150 watershed stakeholders have participated in watershed activities since 1998. The Gun Lake Tribe is coordinating its efforts through partnerships that include:

- Kieser & Associates
- The World Resources Institute
- Area Conservation Districts
- The Environmental Trading Network
- Michigan Department of Environmental Quality
- Michigan Department of Agriculture
- USDA Natural Resource Conservation Service

Lake Allegan was one of the first in the state to have an approved Total Maximum Daily Load that covers the headwaters to the lake.

Project partners work with farmers on conservation practices to reduce nutrients. (Lynn Betts)

"We are delighted to make a contribution that can improve conditions within our ceded territories in the Kalamazoo watershed. Many American Indians still rely upon subsistence practices in their lives. Improved water quality and habitat can only create better living conditions for all Americans."

– Tribal Chairman D.K. Sprague

Targeted Watersheds

Kenai River

AK

WHY IS THIS WATERSHED SPECIAL?

One of the most important watersheds in Alaska, the Kenai River provides world-class salmon fishing and wilderness recreation. It drains more than 2,200 square miles and is home to 34 fish species. Its watershed supports a variety of multiuse recreational activities that include rafting, kayaking, motor boating, drift guiding, hunting, snowmobiling, hiking, and camping. Within a two-hour drive from Anchorage, the watershed is accessible to over 70 percent of the state's population and accounts for 19 percent of the state's sport fishing.

ENVIRONMENTAL CHALLENGES

The most immediate concerns facing the Kenai are related to recreational impacts from in-river motorized boat use.

- Hydrocarbon levels exceed water quality standards established for fish and aquatic life in areas of heavy boat use.
- Habitat loss due to boat wakes, all-terrain-vehicle crossings of stream channels, and culverts are a primary source of accelerated erosion.

The Kenai River supports numerous recreational activities, including world class salmon fishing.

RESTORATION ACTIVITIES

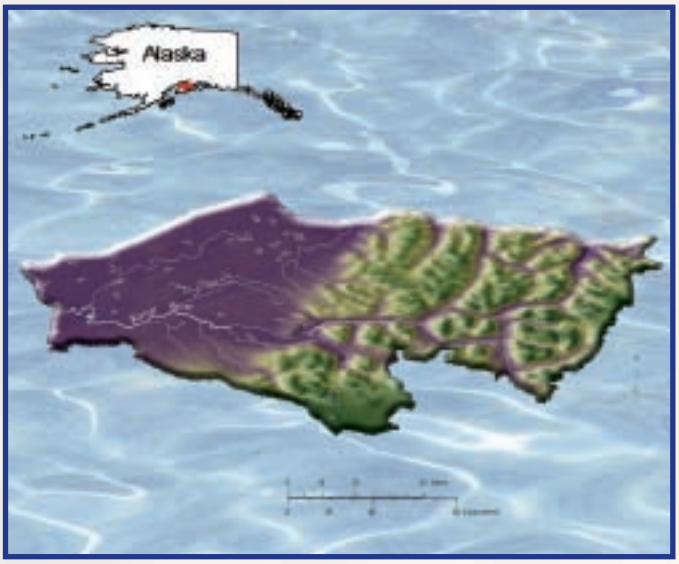
The Kenaitze Indian Tribe, I.R.A. will use its grant award to address these two watershed threats – hydrocarbon pollution caused by outboard motors and stream bank erosion caused by boat wakes. Project activities will protect and preserve the river by implementing market-based and stewardship incentives and by engaging community members.

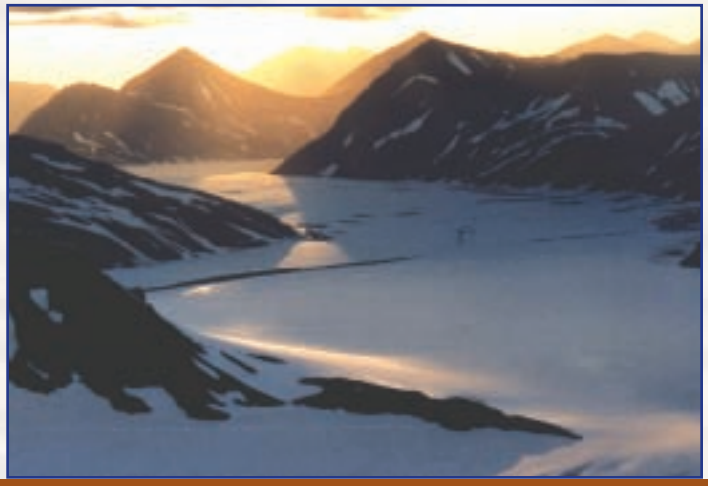
- The Two-Stroke Boat Motor Buyback Incentive Program aims to reduce the effects of hydrocarbon emissions from two-stroke boat motors by providing cash vouchers to private consumers toward the purchase of a nonmotorized drift-boat or a 2006 manufacture emission compliant motor when the two-stroke motor is traded in.
- The Boat Wake Erosion Reduction Program will reduce the effects of boat wakes on stream bank erosion, through a "river-friendly guide" incentive program featuring permit fee reductions, a voucher program to encourage private consumers to select flat bottom or nonmotorized boats when purchasing a boat for use on the Kenai River, and continued monitoring and evaluation of boat wake effects on stream banks.
- Ongoing water quality monitoring by the Kenai Watershed Forum will help measure hydrocarbon concentrations from outboard motors. Weekly sampling will occur during peak recreation times.

A STRONG PARTNERSHIP FOR CHANGE

Under the EPA Targeted Watershed Grant, the Kenaitze Indian Tribe I.R.A., the Alaska Department of Natural Resources, and the Kenai Watershed Forum will collaborate to implement project activities. Further support comes from:

- Kenai River Special Management Area Advisory Board
- Kenai National Wildlife Refuge
- Kenai Peninsula Borough
- Kenai River Center
- Kenai Watershed Forum





Sunset over the Kenai.

The Kenai River

"This grant offers an excellent opportunity for the tribe to work with our community partners for the protection of a river which has been the lifeblood of Kenaitze people for generations."

– Brenda Trefon, Kenaitze Indian Tribe I.R.A

Lake Tahoe

CA, NV

WHY IS THIS WATERSHED SPECIAL?

Because of its extraordinary water clarity, Lake Tahoe is designated an Outstanding National Resource, which affords it the highest level of protection under the federal Clean Water Act. At 6,223 feet above sea level in the Sierra Nevada mountains, the lake spans portions of both California and Nevada and is a national scenic and recreational treasure. The second deepest lake in North America, with a maximum depth measured at 1,645 feet, it is the tenth deepest in the world. It contains enough water to cover the entire State of California to a depth of 14.5 inches. The region's annual $1 billion economy depends heavily on the beauty of this sapphire-blue lake, which attracts millions of visitors each year to its stunning peaks and beautiful shorelines.

ENVIRONMENTAL CHALLENGES

Since 1968, scientists have measured a decline in the lake's famous water clarity at the alarming rate of one foot per year due to algae growth and suspended sediments associated with human activity. During this time, Lake Tahoe's clarity, as measured by a plate sized secchi disk, has declined from 29.5 meters (97 feet) to 22.5 meters (74 feet).

- Recent research indicates that in-basin atmospheric pollutants contribute significantly to the decline in clarity.
- Population increases, air pollution, stream channel erosion, upland erosion, loss of wetlands, and historical sewage disposal have contributed to lost water clarity.
- Nitrogen, phosphorus and fine sediment from streams, groundwater, urban runoff, and atmospheric deposition are responsible for degrading water quality.

Eagle Falls (Jon Paul)

RESTORATION ACTIVITIES

Numeric limits on urban runoff, construction controls, and stormwater treatment for existing and new development as established by the Tahoe Regional Planning Agency's Regional Plan have been in place since 1987. Although both point and nonpoint source controls are more prevalent in Tahoe than many places in the United States, work currently underway to develop a Lake Tahoe Nutrients and Sediment Total Maximum Daily Load (TMDL) will allow for more scientific, market-based approaches to restoring lake clarity to be developed and evaluated. EPA Targeted Watersheds Grant funds will be used to:

- Evaluate the potential for, and if determined to be feasible, develop a water quality trading strategy that will include cross media (air-water) opportunities and will link land use, air pollution, and best management measures to water clarity goals
- Evaluate new approaches and technologies for pollution control at Lake Tahoe, including measures to control air-borne pollutants from transportation sources
- Incorporate data on new and traditional Best Management Practices (BMP) into a matrix to determine their basin-wide potential to achieve required numeric load reductions, information that will help guide watershed management decisions and potentially enable trading

A STRONG PARTNERSHIP FOR CHANGE

To restore lake clarity, the Lahontan Regional Water Quality Board and the Nevada Division of Environmental Protection will collaborate on developing the Lake Tahoe Nutrients and Sediment Total Maximum Daily Load, a holistic watershed plan to address water quality impairments. The Lake Tahoe Basin is unique in that two states (Nevada and California) and numerous entities have been engaged in watershed protection efforts for years. The number, nature, and longevity of active stakeholder groups demonstrate the high degree of coordination already occurring. These groups include:

- Water Quality and Transportation Coalition
- Lake Tahoe Interagency Monitoring Program
- Storm Water Quality Improvement Committee
- Lake Tahoe Environmental Education Coalition
- Lake Tahoe Science Consortium
- Numerous government agencies at the federal, state and local level

Alpine Morning (Jon Paul)

"The Targeted Watershed Grant could not have happened at a better time. The grant will greatly expand on our ability to strategically plan for the protection of Lake Tahoe and improve the water clarity for which the lake is famed."

– Dave Roberts, Environmental Scientist, Lahontan Regional Water Quality Control Board, Lake Tahoe Sediment and Nutrients TMDL Project Manager

Nashua River

MA, NH

WHY IS THIS WATERSHED SPECIAL?

The Nashua River watershed encompasses 31 communities in north central Massachusetts and southern New Hampshire. Nearly 240,000 people live and work within its 538 square miles. Still largely rural, yet at the edge of a major metropolitan area, the watershed is over 60 percent forested. The Massachusetts portion includes a designated Outstanding Natural Resource Area for cold water fisheries and supports more than 20 rare or endangered species. Because groundwater and surface water are closely linked, the watershed serves as an ideal study area for integrating drinking and surface water protection efforts.

ENVIRONMENTAL CHALLENGES

Protecting existing and future drinking water supply sources in the face of strong development pressures is a critical issue for rapidly growing states. Sharply increasing pressures from rapid growth and the resultant decline of open space contribute to two overarching water problems: nonpoint source pollution of the surface waters and increasingly comprised groundwater supplies. The growth rate in the Massachusetts towns in the study area is projected to be 25 to 40 percent through 2010, and 70 to 140 percent in the New Hampshire towns.

- Build out analyses project water demand in Massachusetts to far exceed safe yields of ground water resources.
- Public water supply land is not adequately protected despite state requirements.
- New development poses threats to water quality from sodium and chloride, pesticides and fertilizers, fecal coliform, and chemicals and solvents.
- Impervious surfaces are about 7 percent, but studies suggest 10 percent is the threshold percent to protect water resources in the study area.
- About 79 percent of the Squannacook subbasin and 66 percent of the Nissitissit subbasin are forested (research suggests 75 percent as the threshold percent to protect water resources).
- Forest land overall is at most only 25 percent actively managed.

RESTORATION ACTIVITIES

The Nashua River Watershed Association (NRWA), which has a proven record of success in taking on difficult environmental issues, will use EPA Targeted Watersheds Grant funds to:

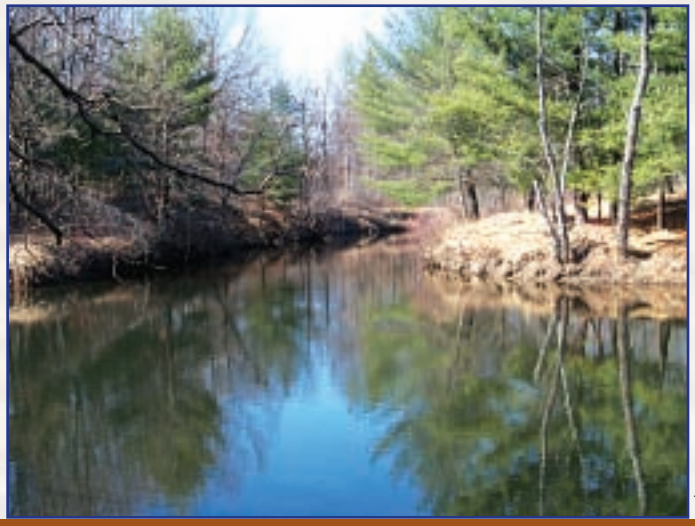
- Increase incentives to individual and municipal forest landowners to voluntarily expand their stewardship and land protection
- Explore market-based opportunity for collective landowners through a forestry cooperative
- Increase incentives for foresters to receive training in ecological approaches
- Provide practical model conservation and restoration sites
- Develop forward-looking smart growth regulatory approaches at the municipal and state level
- Provide baseline water quality information
- Act on new understanding of why some landowners can be resistant to pro-activity

Gulf Brook, a tributary of the Nissitissit River.

A STRONG PARTNERSHIP FOR CHANGE

EPA Targeted Watersheds Grant funds will allow the NRWA to continue in its strong collaborative work. This project follows directly from the recently completed bi-state Source Water Stewardship Demonstration Project, in which NRWA, the State of New Hampshire, the Commonwealth of Massachusetts, and the Trust for Public Land and other organizations all participated. NRWA is currently partnering with:

- Beaver Brook Association
- New England Forestry Foundation
- Trust for Public Land
- A broad interstate coalition of stakeholders



The mouth of the Nissitissit River.

"Working as a broad coalition, the NRWA and its partners are honored that the U.S. EPA is supporting our proactive project to 'protect today's water for tomorrow' in a threatened region of our watershed."

– Elizabeth Ainsley Campbell, Executive Director, Nashua River Watershed Association

Targeted Watersheds

Passaic River

NJ

Headwaters of the Passaic River in the Highlands of New Jersey.

WHY IS THIS WATERSHED SPECIAL?

The Passaic River, which traverses both New Jersey and a small portion of New York, has historically been an area of significant industrial activity and is now one of the most impacted rivers in the northeast. Approximately two million people—one quarter of New Jersey's population—live within 669 square miles of the 803-square-mile watershed. In addition, 23 reservoirs, all within the nontidal portion of the river, provide potable water to New Jersey's residents.

ENVIRONMENTAL CHALLENGES

The New Jersey Department of Environmental Protection recently funded watershed characterization and assessment studies. These revealed that surface water quality standards for nutrients, dissolved oxygen, pH, temperature, pathogens, metals, and pesticides are often exceeded.

- Phosphorus loads must be reduced to restore water quality in the rivers, lakes, and reservoirs.
- Nineteen wastewater treatment plants within the nontidal portion of the Passaic River watershed each discharge more than 1 million gallons per day of treated effluent. The plants, studies assert, contribute a large percentage of the phosphorus load.
- Upgrading wastewater treatment plants to meet an effluent limitation for total phosphorus would be extremely costly. All additional costs would be passed on to taxpayers in the form of higher sewer rates unless a water quality trading program with the potential to significantly lower costs is implemented.

RESTORATION ACTIVITIES

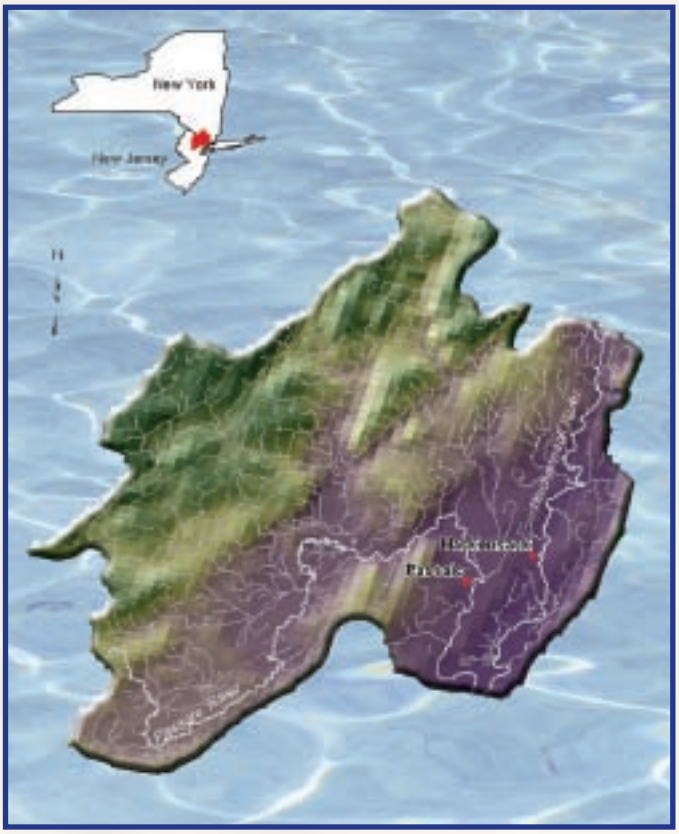
EPA Targeted Watersheds Grant funds will be used to develop, implement, and evaluate an effective water quality trading program for the nontidal Passaic River Watershed that adheres to EPA's Water Quality Trading Policy. The focus of the program will include both point-point source trading and point-nonpoint source trading. The partners will:

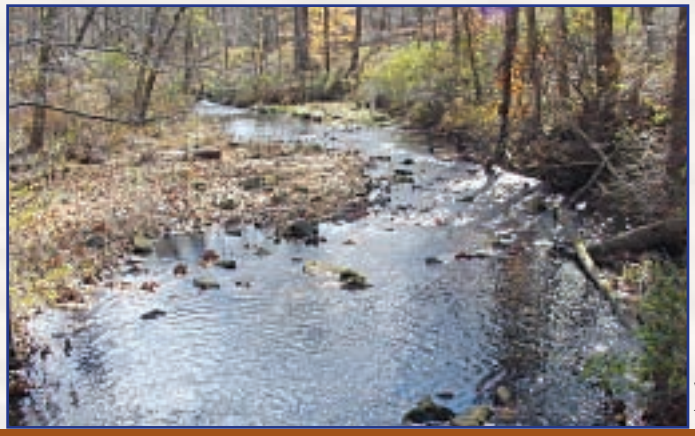
- Review available studies to identify potential trading scenarios and examine ongoing projects around the country to identify models that can be adopted
- Evaluate potential trading scenarios from a scientific and economic perspective and develop a model that will quantify potential load reductions and cost savings
- Evaluate the public policy and legal aspects, including permitting and enforcement implications, of water quality trading as it pertains to the Passaic River watershed and New Jersey statutes, regulations, and policies
- Develop and implement a trading program, including facilitating trading negotiations and recommending modifications to permits
- Report results at local, regional, and national meetings and in peer-reviewed journals
- Develop a website for the project. A website has been initiated for the project at **www.water.rutgers.edu/projects/trading/WQTrading.htm**

A STRONG PARTNERSHIP FOR CHANGE

The watershed contains 19 major point sources. Each may require different levels of upgrade to achieve water quality standards, making a trading program very attractive. An active coalition assembled to complete this endeavor includes:

- The Passaic River Basin Alliance, a nonprofit coalition of wastewater treatment plants in the Passaic Basin
- Experts from Rutgers and Cornell Universities
- The New Jersey Department of Environmental Protection
- A nonprofit organization of New Jersey municipalities
- The New Jersey Association of Environmental Authorities, a nonprofit organization of state wastewater treatment plants, water utilities, solid waste facilities, and collection system operators





Whippany River, one of the many tributaries to the Passaic River that will be protected through the water quality trading project.

"The EPA Targeted Watershed Grants Program has provided a unique opportunity to develop a water quality trading program for the Passaic River Basin that brings together stakeholders with diverse goals, and align their efforts to improve water quality at reduced cost. We aim to achieve a win-win result for the environment and our stakeholders."

– Christopher C. Obropta, Ph.D., P.E., Rutgers Cooperative Extension

Schuylkill River

PA

WHY IS THIS WATERSHED SPECIAL?

The historic Schuylkill River is not only a working river but also the source of drinking water for more than 1.5 million people. At 130 miles long, with more than 180 tributaries, the Schuylkill drains 2,000 square miles of southeastern Pennsylvania and is the largest tributary to the Delaware Estuary. The watershed is diverse, flowing from the Appalachians through rich farmland and low rolling hills into the highly urbanized Atlantic coastal plain.

ENVIRONMENTAL CHALLENGES

Industrialization and mining in the 19th and 20th centuries left the Schuylkill as one of the nation's most polluted rivers. In recent years, however, the river's water quality has improved and migratory fish are returning, but problems remain. Major causes of degradation include stormwater runoff, agricultural practices, abandoned mine drainage, and sewage overflows.

- Stormwater is the primary cause of impairment, with a total of 273 stormwater impaired stream miles. Most of these are within Montgomery and Philadelphia counties, the watershed's most populous.
- A restoration analysis found that it would cost approximately $288 million to design and reconstruct all impaired stream miles according to natural stream channel design principles. Because this is not a feasible restoration strategy, the Stormwater Workgroup must ensure that the most recent and proven stormwater controls are used in future development and when retrofitting older areas developed without adequate controls.

Last year's winner of the Annual Urban Fun Fishing Fest in the Schuylkill River.

RESTORATION ACTIVITIES

A near-term restoration initiative was developed to address stormwater runoff, agricultural practices, and abandoned mine drainage, to promote market-based strategies, and to evaluate the efficacy of the Schuylkill Action Network as an interjurisdictional approach to water quality management. These efforts will help meet the requirements and balance the priorities of the Safe Drinking Water Act and the Clean Water Act, by creating a "fishable, swimmable, and drinkable" Schuylkill River. EPA Targeted Watersheds Grant funds will be used to achieve four specific goals:

- Achieve measurable pollution reductions
- Provide a model for moving from source water assessment to protection and demonstrate a cooperative approach to maintaining coordinated actions under the Safe Drinking Water Act and Clean Water Act for a large watershed
- Conduct demonstration projects and explore market-based initiatives
- Implement, over the next 3 years, more than 40 demonstration projects relating to stormwater impacts, agricultural impacts, abandoned mine drainage impacts, and market-based strategies

A STRONG PARTNERSHIP FOR CHANGE

EPA Targeted Watersheds Grant funds will be used under the leadership of Philadelphia Water Department and the Partnership for the Delaware Estuary to aid the Schuylkill Action Network's many partners. These include:

- State agencies
- Local watershed organizations
- Water suppliers
- Local governments
- Federal government agencies

School children signing the Constitution of the Schuylkill Action Network (SAN), which is an agreement of watershed residents to join in the SAN's efforts to restore and protect the Schuylkill River.

Various boats on the Schuylkill River along Boathouse Row near Philadelphia.

"This is a truly collaborative initiative, with thirteen organizations and agencies implementing 40 diverse projects spread throughout a watershed almost 2,000 square miles in size. The project managers are all committed and energized for putting the funds to work on the ground, and I'm excited to be part of making that happen."

– Jennifer Adkins, Schuylkill Targeted Watershed Grant Coordinator, Partnership for the Delaware Estuary

Targeted Watersheds

Siuslaw River

OR

WHY IS THIS WATERSHED SPECIAL?

The Siuslaw River meanders 150 miles through Oregon from the edge of the Willamette Valley to the Pacific Ocean. Half of its watershed is managed by federal agencies, industrial timber companies own a third, and the flat valley bottoms, lower hill slopes, and estuary are privately owned and not industrially used. The watershed includes inland valley oak savanna forests and meadows; the Coast Range mountains, one of the best tree-growing areas in the United States; and the tidally influenced estuary zone. The Siuslaw's stands of old-growth forest are the largest remaining tracts of intact coastal temperate rainforest on the north coast of Oregon. The basin once supported huge runs of Pacific salmon, including the largest run of coho salmon south of the Columbia River, which is now at less than 2 percent of its historical population and listed as threatened under the Endangered Species Act. Because of the fertile soil and moderate climate in the Willamette Valley, the watershed includes some of the most productive farming land in the nation.

Landowners along the Willamette Valley put buffers along the river to improve habitat and water quality. (Gary Wilson)

ENVIRONMENTAL CHALLENGES

Eight watershed assessments have been developed for parts of the basin, in addition to a whole-basin assessment. Based on these findings, restoration activities will focus on debris flow cycle, the movement of organic material, sediment, and water, as well as riparian connections to streams. Major threats include:

- Draining, diking, and installing numerous tidegates in the estuary and valley bottoms, which prevent tidal flows in the estuary
- Aggressive forest practices on steep slopes and in riparian areas, which have led to an increased risk of sediment delivery to streams
- Elevated lead and temperature levels in the river, which exceed EPA standards

RESTORATION ACTIVITIES

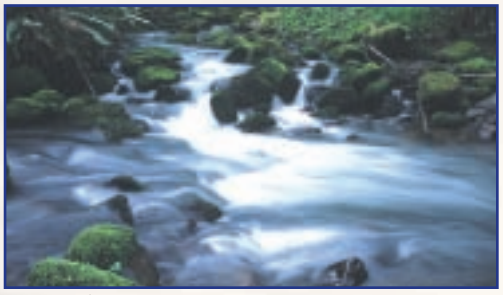
This project seeks to implement a basin-wide restoration initiative to improve the economic integrity in local communities through restoring natural processes in the upper basin. It combines innovative market-based incentives with specific habitat restoration and monitoring and evaluation projects. Targeted Watersheds Grant project tasks include:

- Restoring natural landscape processes by repairing culverts and roads
- Using market incentives to reduce the risk of sediment delivery to stream channels from 10,000 acres
- Restoring 30 miles of riparian habitats and processes
- Protecting and restoring a 5-mile estuary corridor
- Developing and implementing a water quality monitoring and evaluation program

A STRONG PARTNERSHIP FOR CHANGE

Since the 1980s, academic researchers, agency personnel, and community members have been working to develop and implement an integrated ecosystem-based approach to restore the Siuslaw. Five entities – Ecotrust, the Siuslaw Watershed Council, Siuslaw Soil and Water Conservation District, Siuslaw Institute, and Siuslaw National Forest – will manage this project under the EPA Targeted Watersheds Grant. Other partners include:

- Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
- McKenzie River Trust
- Shorebank Enterprise Pacific
- Pacific Coast Watershed Partnership
- Siuslaw and Mapleton School Districts
- Natural Resources Conservation Service
- Bureau of Land Management
- Private landowners and many others



Stream in the Coast Mountain Range in Oregon. (Ron Nichols)

Recreational fly fishing in a mountain stream. (Ron Nichols)

"The Siuslaw Basin Partnership is working to restore what was historically one of the most productive salmon-producing rivers in the Pacific Northwest. With help from the EPA's Targeted Watershed Grants program, we will not only restore the watershed but develop a monitoring plan and conservation incentives that can be replicated in watersheds all over the region."

– Brent Davies, Coordinator, Pacific Coast Watershed Partnership, Ecotrust

Upper Mississippi River

IA

WHY IS THIS WATERSHED SPECIAL?

The Des Moines Lobe, the central focus of this project, is drained mostly by the Des Moines, Raccoon, Iowa, and Skunk rivers in the "prairie-pothole" region in north-central Iowa. Thanks to artificial drainage, this land boasts some of the most valuable and productive farmland in the country. In 2002, the average land value for the 22-county area making up most of the Lobe was approximately $2,500 an acre, and more than 80 percent of that area was used for row crops, 42.9 percent for corn and 37.6 percent for soybeans.

ENVIRONMENTAL CHALLENGES

Nitrate leaching from extensive areas of drained cropland in Iowa and other areas along the Corn Belt is transported down the Mississippi River and is believed to be a contributor to hypoxic (low in dissolved oxygen) conditions in the Gulf of Mexico and to local drinking water quality concerns. Although mismanagement and overuse of fertilizer and manure contributes to water quality problems, hydrological and land-use changes (that is, the conversion of prairies and marshes to row crops) are the leading causes of degradation.

- Extensive subsurface drainage of the Corn Belt (25 percent of Iowa is drained) accelerates the transport of nitrate entering the Mississippi River.
- Subsurface drainage creates very productive croplands and reduces other water quality concerns.

Scientists examine a soil sample. (Charlie Rahm)

RESTORATION ACTIVITIES

A permanent solution to this watershed's challenges involves "structural modifications" of the drainage systems that could have both water quality and crop production benefits. EPA Targeted Watersheds Grants funds will be used to test new technologies involving modified drainage systems, combined with nitrate-removing wetlands. Project partners will:

- Use actual soils, topography, and weather data with improved crop growth, hydrologic, and wetland models to design integrated wetlands and controlled or shallow drainage systems to reduce nitrate loading while maintaining or improving crop performance
- Develop an optimum drainage-wetland system design for specific study areas with landowner cooperation, install it, and monitor its water quality performance
- Conduct outreach to publicize the results to other landowners, the farm media, downstream water users, and policy makers at all levels and explore technology transfer opportunities to other areas in Iowa and beyond

A STRONG PARTNERSHIP FOR CHANGE

The Iowa Department of Agriculture and Land Stewardship and Iowa State University, which together developed the nitrate removal wetland technologies that led to Iowa's Conservation Research Enhancement Program, lead the project team. Further support through expertise, staff, and financial resources comes from:

- Iowa Drainage District Association
- Agri Drain Corporation
- Natural Resources Conservation Service
- Iowa Farm Bureau Federation
- Iowa Environmental Council
- City of Cedar Rapids
- Des Moines Water Works

A restored wetland. (Lynn Betts)

"Our TWG project is developing new approaches for managing water on cropped landscapes to reduce the movement of nitrate to streams, and ultimately, to the Gulf of Mexico hypoxic zone. Farmers will be able to see these technologies through demonstrations under actual field conditions, both to demonstrate the environmental gains as well as impacts upon crop production and farming practices."

– Dean W. Lemke, P.E., Iowa Department of Agriculture and Land Stewardship

Targeted Watersheds

Upper Sangamon River

IL

WHY IS THIS WATERSHED SPECIAL?

The Upper Sangamon River watershed, which lies in central Illinois, is part of the Upper Mississippi River Basin. Lake Decatur, formed in 1922 to provide water for domestic use and processing of agricultural products, is a prominent feature. The portion of the watershed above the lake covers 925 square miles in seven counties, approximately 87 percent of which is in crop production. Decatur, population 82,000, is the largest city in the watershed.

ENVIRONMENTAL CHALLENGES

The Upper Sangamon River watershed has water quality problems typical of agricultural watersheds in the upper Midwest. Numerous problems affect the environment and the people of the area.

- Erosion and sedimentation from cropland and stream banks have been concerns since Lake Decatur's creation.
- Tile drainage, which is used extensively in the watershed, provides agricultural benefits but also contributes to erosive forces and nutrient losses.
- Peak nitrate concentrations in Lake Decatur have exceeded the 10 mg/l drinking water standard most years since 1980. Monitoring by the Illinois State Water Survey in the mid 1990s found the average annual nitrate yield to Lake Decatur to be 23 lbs/acre.
- Scientists suspect that nutrient loads from this watershed and other agricultural watersheds exacerbate hypoxia (low dissolved oxygen) in the Gulf of Mexico.
- The primary objectives of ongoing soil and water conservation efforts are to reduce erosion, sedimentation, and nutrient losses to surface waters without adversely affecting the agricultural economy of the region.

RESTORATION ACTIVITIES

EPA Targeted Watersheds Grant funds will go towards a coordinated set of projects to improve water quality locally, regionally, and in the Gulf of Mexico by enhancing nutrient management for crop production and reducing loss of nutrients.

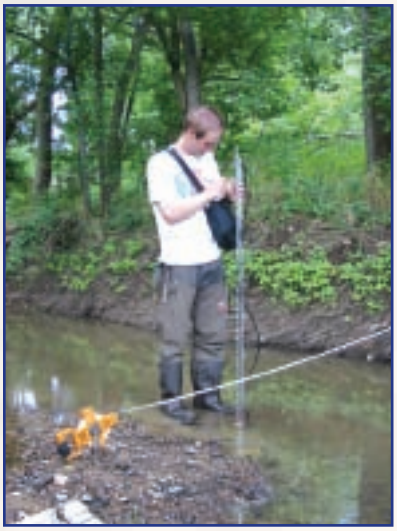
- One project will use GIS-based software and precision agriculture technology in on-farm experiments to optimize nitrogen management. Risk management instruments to protect farmers against income losses from reduced application rates will be demonstrated and refined.
- A second study will demonstrate drainage water management and subsurface bioreactors to reduce movement of nitrates through drainage tiles to surface waters. Cost-effectiveness will be evaluated, allowing for this approach to be scored for point and nonpoint source trading.
- The third study will address economic and environmental benefits from soil testing and variable rate technology to improve phosphorus management. Economic and environmental results will be measured. Stakeholders will evaluate projects, disseminate findings, and identify added strategies to improve nutrient management and reduce losses.

A STRONG PARTNERSHIP FOR CHANGE

Many watershed management programs for the Upper Sangamon have already been implemented by various groups. EPA Targeted Watersheds Grant funds will support the continued cooperation under the lead of the Agricultural Watershed Institute. Key participants and supporters include:

- University of Illinois Departments of Crop Sciences, Agricultural and Consumer Economics, and Agricultural and Biological Engineering
- County Soil and Water Conservation Districts (SWCD)
- American Farmland Trust's Agricultural Conservation Innovation Center
- Illinois State Water Survey
- USDA's Natural Resources Conservation Service
- Individual farmer-cooperators
- Technical service providers in the fertilizer industry

Macon County SWCD watershed tours educate urban and rural residents about conservation practices.



Illinois State Water Survey personnel monitor stream flow and water quality in the Upper Sangamon Watershed.

"The largest component of this grant is trying to improve the efficiency of nitrogen fertilizer management. We'll be working with University of Illinois researchers, Conservation Districts, farmers, and fertilizer dealers to test nutrient management measures and to use information technology. We hope to not only improve farm income, but improve water quality as well."

– Steve John, Acting Executive Director, Agricultural Watershed Institute

Targeted Watersheds