



# Nonpoint Source News-Notes

*The Condition of the Water-Related Environment  
The Control of Nonpoint Sources of Water Pollution  
The Ecological Management & Restoration of Watersheds*

## Commentary

### Implementing the Clean Water Action Plan

By John Meagher, Clean Action Plan Coordinator, U.S. Environmental Protection Agency

On February 19, 1998, President Clinton, Vice President Gore, Agriculture Secretary Dan Glickman, and EPA Administrator Carol Browner released the Clean Water Action Plan. The Plan was the product of an interagency effort initiated four months earlier by Vice President Gore on the occasion of the 25th anniversary of landmark federal clean water legislation enacted in 1972. The Clean Water Action Plan provides an opportunity to bring new tools and additional resources to help accomplish the highest priority tasks confronting water quality managers — including polluted runoff, habitat degradation, and the safety of our waters for drinking, swimming, and eating seafood. The Plan includes 111 actions that will engage federal, state, tribal, and local agencies, working in partnership with nonprofit organizations and private groups, in an ambitious national agenda to improve our waters.

What is the state of the nation's waters? The answer is a mixed one.

- Wastewater treatment is keeping billions of tons of pollutants out of our waters, yet one-third of assessed waters do not meet state water quality standards.
- We are approaching no-net-loss levels of wetlands protection, but frog and other amphibian populations are declining in many areas and often experience high rates of deformities.
- Lake Erie is no longer called a dead lake, but a large dead zone has developed in the Gulf of Mexico.
- Duck populations have recovered in recent years, but one out of every three freshwater fish species is threatened or endangered.
- The Cuyahoga River no longer catches fire, but organisms like pfiesteria and cryptosporidium have raised major health concerns.

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- Our technical ability to remove toxics has improved, but fish consumption advisories and shellfish bed closures are still necessary in many places to protect public health.

In sum, we have accomplished much, but much remains to be done. The Clean Water Action Plan is intended to respond to the remaining problems.

Two central ideas are embodied in the Clean Water Action Plan. The first is bottom-up problem-solving to improve our waters using the watershed framework. The Plan brings the watershed framework center stage as the way to move our water programs forward, through stronger and more direct involvement by communities and local interests. Most states have been moving in this direction, having recognized that we have gotten about as far as we can relying on standardized regulation of a discrete number of point sources. Tribes and federal land management agencies are also relying increasingly on watershed approaches. The watershed framework allows us to adopt a more customized approach to the water quality problems and priorities in individual watersheds — using tools that yield the most environmental results for the dollars invested. It enables us to address the many uses of our water resources — drinking water, recreation, flood attenuation, habitat, and quality of life — in a rational and cohesive way.

The Plan's second central idea is clean water partnerships. The federal government and the state agencies that administer many of the environmental laws enacted by Congress have always worked together, but the Plan expands and intensifies the role of partnerships in accomplishing the work that lies ahead. For federal agencies, this expansion means cooperating more closely than we have in the past. When the Plan was released, Agriculture Secretary Glickman noted that 25 years ago the Secretary of Agriculture would not have been found alongside the Administrator of EPA at a clean water event. The fact that Vice President Gore asked EPA and USDA jointly to develop the Clean Water Action Plan reflects the importance of interagency cooperation in programs to improve our waters. Other agencies participating in the Plan include the Department of Army, Interior, Commerce, Transportation, Energy, and the Tennessee Valley Authority.

The principal reason for federal agencies to work together is to provide improved service to nonfederal partners, especially states and tribes, who implement many water quality programs. Much of the \$568 million increase in the budget that the President has requested of Congress for fiscal year 1999 is to give states and tribes more resources to carry out their work as well as to provide incentives directly to landowners.

While the Plan reflects the importance of bottom-up problem solving and partnerships, only a limited amount of direct collaboration with states, tribes, and other partners was feasible in the 120-day time frame set by the Vice President for the Plan's completion. In developing the Plan, federal agencies built on program innovations developed by states and others. We believe — and we hope that our partners agree — that the Plan truly reflects an understanding of all partners' needs and priorities and provides sufficient opportunities for everyone's participation in the Plan as it is implemented.

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## ***Notes on the National Scene***

### *More than a Destination — Transportation and Sustainability*

Transportation, according to an interagency workgroup called the Transportation and Sustainable Communities Team, is often considered a means to an end. For most Americans, job, community, and recreation lie at the other end of a road, a subway line, or a bus route. But the workgroup is looking at transportation as a reality that shapes our jobs, our communities, our recreation, indeed our lifestyles and our future.

The workgroup, formed by the committee on Transportation Research and Development under the National Science and Technology Council, identifies research needs that bring environmental, economic, and equity issues into transportation policy. The effort is part of a Council objective to coordinate research and development strategies across federal agencies to accomplish multiple national goals. For example, the team is considering input from the Centers for Disease Control and Prevention on the health benefits of walking along with other key issues such as sprawl, environmental quality, and social equity, according to Bill Lyons of the Department of Transportation's Volpe Research Center, the lead agency on the project.

Those issues and more ultimately feed into the concept of “sustainability,” for which the workgroup uses a description coined by the World Commission on Environment and Development: “a sustainable condition . . . [is] achieved through meeting the needs of the present without compromising the ability of future generations to meet their own needs.”

Present and future needs for sustainability, according to the workgroup include a healthy environment (e.g., air, water, land, habitat), a sound economy (e.g., economic growth, energy, freedom from congestion), and social equity (e.g., access, mobility, justice).

According to Ed Drabkowski, a workgroup member representing EPA’s Office of Water, decisions based on development demands alone often run counter to efforts to achieve sustainability. The negative impacts of uncontrolled land use and transportation contribute to congestion, sprawl, air and water pollution, global warming, and inefficient land use. Drabkowski points out that decision makers need to understand how best to balance the sometimes conflicting goals of economic growth, environmental quality, and social equity needed to achieve the objectives of sustainability. The workgroup, says Drabkowski, is optimistic about its mission to explore how transportation and land use systems can contribute to this balance.

The group intends to produce an “investment plan” for federal research and development that will determine research needs and make funding recommendations. The plan they foresee will explain the complex relationships between transportation systems and community development and environmental effects, outline the dimensions of a sustainable transportation system, and preview ways to achieve it.

Last year, the workgroup identified key research areas needed to foster “sustainable” transportation, including sharpening the national focus on the implications of sustainable transportation and expanding research on behavior associated with development patterns, the influence of transportation infrastructure on travel demand, climate change, growth patterns, alternative vehicles and fuels, and infrastructure needs in revitalizing urban areas.

A report on the workgroup’s first phase was released in November of last year. The team is now developing a short-term strategic framework to coordinate the research agenda of the various federal agencies concerned with transportation and sustainability.

[For more information, contact Ed Drabkowski (4503F), U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460. Phone: (202) 260-7009. Or contact Bob Nolan, (2126), U.S. Environmental Protection Agency, 401 M St. SW, Washington, DC 20460. Phone: (202) 260-2418. Or see <<http://scitech.dot.gov/partech/sustran/sustran.html>>.]

## Workgroup on Transportation and Sustainable Communities

### Participants

Army Corps of Engineers  
Department of Energy  
Department of Health and Human Services  
Department of Housing and Urban Development  
Department of Interior  
National Park Service  
Department of Transportation  
Federal Highway Administration  
Federal Transit Administration  
Environmental Protection Agency  
Office of Mobile Sources  
Office of Policy, Planning, and Evaluation  
Office of Research and Development  
Office of Water

## Electric Vehicles Advance Sustainable Transportation

McClellan Air Force Base in Sacramento, California, may be famous for what it does in the air, but it also deserves recognition for its accomplishments on the ground. The base owns and operates the world’s largest operational fleet of electric vehicles — proving that transportation can participate in our transformation to a “sustainable” society.

Short trips (less than five miles) with frequent stops are typical of traffic on the base. In traditional vehicles, this pattern would produce heavy emissions, but at McClellan Air Force Base, that is not the case. The use of more than 80 electric vehicles to replace gas-fueled pickup trucks, minivans, passenger shuttle buses, and forklifts has dramatically reduced emissions of nitrous oxides, carbon monoxide, and other air pollutants. The result is not only cleaner air, but also cleaner water. Fewer pollutants in the air means fewer pollutants being washed by rain and snow into local streams and rivers.

The Electric Vehicle Program has expanded its Electric Vehicle Demonstration Program to other DOD installations, and it continues to research and develop new alternative vehicle technologies, such as cars that run on compressed natural gas.

In 1996, the Sacramento Metropolitan Air Quality Management District presented McClellan Air Force Base with the nation's first Mobile Emission Reduction Credit (MERC) Certificates. This occasion marked the first time such credits had been awarded to a mobile fleet. MERCs are generated when reductions in emissions from cars and buses exceed the reductions required by federal, state, and local mandates. MERCs may be used to offset increases in emissions associated with economic growth or industrial sources and to improve air quality.

[For more information, contact the Environmental Management Directorate, U.S. Air Force, 5050 Dudley Boulevard, Suite 3, McClellan Air Force Base, CA 95652-1389, or visit their website: <[www.mcclellan.af.mil/EM/EV](http://www.mcclellan.af.mil/EM/EV)>.]



**Transportation Science and Technology**, available from the National Transportation Science and Technology Council's Committee on Transportation Research and Development, contains a strategic plan developed by the Council to address the President's commitment to national transportation goals: safety, security, mobility, economic competitiveness, and environmental quality. To order copies of the report, phone (202) 456-6100. For additional information on federal, national, and international transportation planning, technology, and research, visit the Council's website: <<http://www.scitech.dot.gov>>.

## USDA/EPA Announce New Joint Strategy on Animal Feeding Operations

USDA and EPA are developing a unified national strategy for controlling pollution from animal feeding operations (AFOs). Directed by the President's Clean Water Action Plan and using ideas from EPA's earlier draft AFO strategy, the two agencies are now completing a draft for public review. A final strategy is due in November.

Approximately 450,000 AFOs operate in the United States, ranging from small livestock production facilities with few animals to large, geographically concentrated facilities that can generate animal wastes equivalent in magnitude to the volume of waste produced by a medium-sized city.

The nature of the animal feeding and production industry has changed dramatically over the past two decades. Advances in technologies for raising and feeding animals, new methods of manure management, and organizational changes have transformed major parts of the industry. USDA data show a shift from smaller to much larger operations. In North Carolina, for example, the number of hog farms decreased by 62 percent between 1982 and 1992 while the average number of hogs per hog farm increased by 578 percent.

Most water quality problems stemming from AFOs are addressed through voluntary programs that offer technical assistance, cost-share financing, and other incentives. Large AFOs and those causing significant water quality problems are regulated by EPA. In addition, many states have regulatory programs that address water pollution from AFOs.

Under Section 502 of the Clean Water Act, concentrated animal feeding operations (CAFOs) are identified as point sources and must obtain National Pollutant Discharge Elimination System (NPDES) permits. But of the estimated 6,600 CAFOs in the nation, less than a quarter have NPDES permits.

### Major Components of the AFO Strategy

The new strategy includes the following key elements:

- **Program Coordination and Interagency Cooperation.** USDA and EPA will work together in areas of common interest, including data collection and management, technical standards development, monitoring, and the establishment and use of appropriate environmental performance measures. For example, USDA will continue to review and revise comprehensive technical standards and educational programs for AFOs in cooperation with other federal agencies. However, USDA and EPA will work together to ensure that appropriate management systems are incorporated into Clean Water Act discharge permits by states and EPA.
- **Comprehensive Management Systems.** USDA and EPA will work to establish environmentally sustainable systems containing practical and cost-effective approaches to

managing manures and carcasses. For example, the USDA/EPA measures will establish comprehensive and verifiable management systems for AFOs by 2002, engage stakeholders to implement farm-specific nutrient budgets on at least 50 percent of AFOs by 2005, and promote the development of marketable products from animal wastes and carcasses from 1998 onward. Comprehensive management systems should be incorporated into Clean Water Act discharge permits issued by EPA and states. EPA will work with states to issue Clean Water Act discharge permits to the largest facilities (those with more than 1,000 animal units) by 2005.

■ **Better Permit Regulations.** EPA will work with USDA and states to revise the Clean Water Act discharge regulations, including comprehensive management measures (e.g., land application) by 2002; revised feedlot effluent limitations guidelines for poultry and swine by 2001, for beef and dairy cattle by 2002; and improved tools for writing discharge permits under current regulations (e.g., case-by-case designation guidance and guidance on establishing best management practices and technology requirements) by the end of 1998.

■ **Incentives to Enhance Environmental Protection.** Through new initiatives such as an awards program recognizing pollution reduction efforts by AFOs, federal agencies will encourage environmental protection beyond that required by regulatory controls. Other programs will include incentives for converting animal wastes into marketable products and a public/private partnership to create market incentives to improve environmental performance.

■ **Coordinated Plan for Research.** In cooperation with stakeholders, federal agencies will develop a plan for research, development, and assessment that prioritizes research needs in nutrient management and the handling of pathogens and other pollutants. The plan will also include research on modifying animal diets to reduce nutrients in manure, mitigating sites with excess pollutants, and assessing best management practices.

■ **Watershed Nutrient Budgets.** Federal agencies will determine the relative contributions of nutrients in water from all sources. By 1998, USDA will publish data on counties having potential nutrient excesses from animal manure. By 2000, EPA and USDA will use data from many sources, including fertilizer sales, the Census of Agriculture, and permit limits, to estimate a baseline of nutrient loads to those watersheds. USDA will revise the Census of Agriculture to include waste management practices by the 2002 census.

■ **Priority Watersheds.** Federal and state agencies should ensure that activities such as permitting, inspections, enforcement, funding, education, outreach, and technical assistance for AFOs are targeted to priority watersheds. For example, by 1999, EPA, with support from USDA, states, and tribes, will identify watersheds at greatest risk of pollution from AFOs. By 2000, EPA and USDA will develop criteria for, and demonstrate the effectiveness of, providing targeted, coordinated assistance and federal environmental subsidies to states and AFOs. EPA will also increase enforcement of existing permits and unpermitted discharges, require new permits as appropriate, and, if necessary, use emergency powers to address situations presenting imminent and substantial danger.

■ **Certification Program.** The strategy will encourage establishment of a certification program to ensure that effective management systems are available and used by unpermitted AFOs.

*[For more information on the strategy, check <<http://www.epa.gov/epahome/WhatsNew.html>> or contact John Kosco, U.S. EPA, Office of Water, 401 M Street, SW, Washington, DC 20460. Phone: (202) 260-5700. Email: [john@epamail.epa.gov](mailto:john@epamail.epa.gov).]*

## Definitions

■ **Animal Feeding Operations (AFOs)** are facilities where animals have been, are, or will be stabled or confined for a total of 45 or more days in any 12-month period and crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

■ **Confined Animal Feeding Operations (CAFOs)** are facilities that (1) confine more than 1,000 animal units or (2) confine 301 to 1,000 animal units and discharge pollutants into waters of the United States.

■ **"Animal units"** vary according to livestock type. For example, 1,000 slaughter and feeder cattle or 700 dairy cattle are equal to 1,000 animal units. Poultry and swine animal units are defined by weight and facility type.

*For the complete definitions of AFO, CAFO, and animal units, see the Strategy for Addressing Environmental and Public Health impacts from Animals Feeding Operations or 40 CFR 122.23 and Part 122 Appendix B.*

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## **News from the States**

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### *Fish and Wildlife Service Honors Michigan Landowners for Wetland Work*

For one family near Glennie, Michigan, restoring wetlands has almost become a way of life. Since 1994, Randy and Lois Lanski have restored and enhanced five wetlands amounting to 157 acres on their 600-acre property. First, they tackled a 52-acre site known as the Heron Rookery. Next, they restored the 50-acre Bear Lake Marsh and the 30-acre Beaver Lake Marsh. They finished up with the 17-acre North Marsh.

For their efforts, the couple has been nominated for a National Wetlands Conservation Award by the U.S. Fish and Wildlife Service. The Lanski wetlands provide flood control for downstream residents and improve the water quality of two associated creeks by filtering runoff from adjacent roads and lawns.

The restored wetlands also provide important migration and nesting habitat for many species of migratory birds, including Canada geese, bitterns, and prothonotary warblers. Mallards and wood ducks are common nesting ducks that frequent the wetlands. During annual migrations, bald eagles and osprey are regular visitors, and great blue herons are recolonizing Heron Marsh.

Other nesting nongame and migratory shorebirds, waterfowl, and songbirds are drawn to the restored wetlands and surrounding managed forest. Wild turkeys are increasing because of enhanced nesting and brood-rearing habitat; ruffed grouse are finding refuge in the forest. In addition to their wetland acreage, the Lanskis manage 390 acres of bottomland deciduous and coniferous forest communities and 53 acres of native grasslands.

The wetlands on their land were restored through the Fish and Wildlife Service's Partners for Fish and Wildlife program. During the last decade, thousands of private landowners nationwide have participated in the Partners for Wildlife program. Since its beginning in 1987, almost 650,000 acres of important fish and wildlife habitat on private land have been restored at no cost to landowners.

#### *New Funding Helps Program Grow*

Partners for Wildlife began as a cooperative effort with private landowners who voluntarily offer to restore drained, degraded, and marginal habitats; but the program was recently renamed Partners for Fish and Wildlife (PFFW) to reflect an increase in funding that is now available to landowners who also wish to address specific fisheries. Efforts to restore riparian and in-stream habitats on private lands are also included in the program.

The Fish and Wildlife Service contributes funds, technical assistance and equipment for PFFW habitat-restoration projects. And it works. Since 1987, more than 70,000 acres of wetlands have been restored in eight states of the upper Midwest and more than 3,500 upper Midwest landowners have signed development agreements with the Service to receive cost-share assistance. To receive this free financial support, landowners agree to protect the restored habitats for a minimum of 10 years, thereby guaranteeing the financial investments shared by the Service and its partners. Voluntary participation allows landowners to retain all previous ownership rights and responsibilities, including the right to limit public access.

#### *Other PFFW Accomplishments*

Contributions from partners during 1997 resulted in the restoration of more than 3,200 acres of wetlands. In addition, almost 3,000 acres of upland habitat—including more than 1,950 acres of native grasses/forbs and 280 acres of bottomland hardwood timber—were planted.

In addition to enhancing fish and wildlife habitats, soil and water conservation values associated with the PFFW program include reduced runoff, reduced soil erosion, conservation education and outreach potential, enhanced recreational opportunities, and improved economic opportunities.

*[For more information, contact Steve Kufrin, U.S. Fish and Wildlife Service, Branch of Private Lands at (612) 713-5447. For further information about the programs and activities of the U.S. Fish and Wildlife Service in the Great Lakes-Big Rivers Region, please visit <<http://www.fws.gov/r3pao/>>.]*

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## On Maui's Shores — Searching for Answers to Algae

An island famous for its native plants is under siege. Algal blooms are plaguing Maui's coastal waters, causing unsightly masses of decaying plants in areas that are otherwise tourist havens. Hawaiian researchers blame submarine seeps of nutrient-laden ground water for the problem, which on occasion, causes algal blooms thick enough to change the marine ecosystem.

For four years, the West Maui Watershed Project, funded by the Hawaii Department of Health (HDOH), EPA Region 9, and the National Oceanic and Atmospheric Administration (NOAA), has been trying to uncover the causes of the blooms and improve nearshore water quality throughout West Maui.

The University of Hawaii and the Watershed Project now report that high levels of nitrogen and phosphorus support the excessive algae growth, which most frequently involves the fast-growing green *Ulva fasciata* and the red *Hypnea musciformis*. *Ulva*, commonly called sea lettuce, is the greater nuisance. A lesser culprit, *Cladophora* spp., caused problems in 1989 and 1991.

Researchers note that fertilizers from crop fields, golf courses, other landscaped areas, coastal cesspools and septic tanks are leaching into ground water and traveling to nearshore waters through submarine seeps. Oceanic nutrients, runoff from streams, and sewage from relatively deep injection wells, although originally suspect, have now been shown to have little impact.

### *South Carolina Studies Helpful*

Ground-water seeps, areas where fresh water enters the ocean from an underground source, are found along the entire shoreline of Maui. Ground water from higher elevations carries pollutants to underground "rivers" that eventually exit through cracks in the ocean floor. In coastal areas, seawater seeps into the cracks at high tide and mixes with the freshwater; then the mixture flows back to the ocean at low tide. Tidal pumping, as this process is called, has been studied in detail at the University of South Carolina. Scientists there found that as many as eight billion gallons of ground water flow into the ocean along South Carolina's coast each day — about half as much fresh water as South Carolina's rivers discharge to the ocean.

The seeps provide biologically important nutrients to marine organisms such as coral. However, too many nutrients unleash the unwanted algal blooms. On Maui, fertilizers from sugar cane, pineapple, and coffee fields as well as landscaping at hotels, condos, and golf courses all contribute to ground water's high nutrient content.

### *Hawaiian Scientists Search for Culprits*

"Research has vastly improved our understanding of algal blooms in the West Maui area," said Bruce Anderson, Deputy Director for Environmental Health at HDOH, "We now know that nutrient inputs from land are required to support the large algal blooms that we observe at specific locations along the shore; naturally occurring oceanic nutrients alone are not sufficient."

In 1996, scientists found that approximately 87 percent of the nitrate in Maui's ground water comes from fertilizers applied to crops. Yet studies show that surface runoff and streamflow, common culprits when it comes to nutrient pollution, are not been important sources of nutrients along Maui's shore. The annual nutrient input from ground water is 4 to 16 times greater than the total annual input from streams.

Dr. Edward Laws, professor of oceanography at the University of Hawaii at Manoa, believes that further studies are needed before surface runoff and streamflow can be let off the hook completely. Virtually all streams in the watershed are diverted for irrigation, Laws says. Nearly all are dry at lower elevations during most times of the year and discharge to the ocean only during times of heavy rainfall. "Therefore, during a dry year, [such as the years in which these studies were conducted], ground-water seepage is by default the only significant source of freshwater entering the ocean. Nutrient inputs from stream runoff may be quite significant during rainy periods."

Phosphorus, Laws adds, is also an essential nutrient for algae growth. Hawaiian soils are unusually rich in iron, which binds with phosphorus, trapping it in the soil. Hawaiian soils strip ground water of most of its phosphorus, but excess phosphorus is still making its way to Maui's coastal waters. That is evidence, Laws believes, that other sources, particularly streams, are adding phosphorus and nitrogen to the shoreline.

Although scientists are still studying the exact source of the excess nitrate, the West Maui Watershed Project has already begun educating potential polluters. Several workshops on fertilizer practices were held throughout Maui County to educate homeowners and managers of hotels, condos, and apartments about pollution prevention practices and environmentally friendly fertilizing techniques.

The Cooperative Extension Service and the Landscape Industry Council of Hawaii also offer training courses on landscape fertilizer use and other aspects of landscape management. The Landscape Industry Council published a manual, *Landscape Management Guidelines* (1996), which is designed for the landscape industry and property managers who contract for specific landscape maintenance services. The guide explains the principles of landscape management to help ensure that both the landscape and the environment are cared for properly.

### **Pineapple Company Does Its Share**

Wesley Nohara of the Maui Pineapple Company, which maintains more than 7,500 acres of pineapple fields, is an active member of the West Maui Watershed Management Project Advisory Committee. According to Nohara, in response to the project's findings, the company has reduced fertilizer applications, conducted two water quality demonstration projects with section 319 funds, and developed a farmwide conservation plan that was certified by the NRCS — all in the name of nonpoint source pollution prevention. Lands owned by the Maui Pineapple Company fall within a state-designated marine life conservation district, making their land management practices even more critical. Some of the Company's farmland is within 300 yards of the shore.

In addition, Maui Pineapple Company owns the 8,661-acre Puu Kukui Preserve, the largest privately owned and managed natural area in the state. It is an important link to 13,000 acres of contiguous protected watershed, which provides much of the fresh water for West Maui's residents, as well as the agriculture and tourist industries. Maui Pineapple Company manages the land in partnership with the State Department of Land and Natural Resources through the state's Natural Area Partnership Program. The company has also donated land for several silting basins to help reduce the amount of nutrients and sediment running off its farmland into the ocean.

HDOH conducted a survey of hotels and condos regarding their water and energy use, landscaping practices, building and maintenance practices in summer 1997. The same agency is using the survey results to develop additional educational programs for Maui's resort properties.

The culmination of the efforts by the West Maui Watershed Project is a set of watershed management documents, including a *Watershed Owners Manual* that recommends watershed management tasks for all stakeholders; a booklet, *Island Stewardship: Guide to Preventing Water Pollution for Maui's Homes and Businesses*; and a BMP booklet for boaters.

Maui watershed practitioners aren't stopping there, though. In fiscal year 1998, they plan to revise county codes to require erosion control BMPs at all construction sites and to develop enforceable procedures for use in following up on illicit dumping, wastewater spills, erosion, and drainage complaints. More BMP manuals will be developed and outreach conducted regarding erosion controls, grading, and stormwater drainage.

Maui County will also set up a hotline for citizens to call and report environmental crimes such as illegal storm drain dumping, or to get information on pollution prevention practices.

Over the next three years, HDOH will use aerial hyperspectral imagery to survey algal blooms on Maui and to develop a geographic information system linking the algal blooms with land-based nutrient sources. Other ongoing projects will reduce soil erosion from forested areas; develop erosion control BMPs for pineapple and sugar cane fields; and determine if eliminating cesspools will help reduce algal blooms.

[For more information or copies of publications mentioned, contact Wendy Wiltse, Watershed Coordinator for the West Maui Watershed Project, U.S. EPA, Pacific Islands Contact Office, P.O. Box 50003, 300 Ala Moana Boulevard, Honolulu, HI 96850; phone: (808) 541-2752; fax: (808) 541-2712.]

## **Delaware Sea Grant Surveys Residents — Finds Delmarva Residents Committed to Clean Bays**

Citizens of Delmarva — an eastern peninsula shared by Delaware, Maryland, and Virginia — are committed to keeping their coastal bays healthy, despite increasing pressures from a growing coastal population, according to a survey recently conducted by Delaware Sea Grant.

Besides providing habitat for more than 100 species of fish, migratory shorebirds, and other wildlife, Delmarva bays (which extend from Rehoboth Bay in Delaware to South Bay in Virginia) annually attract millions of visitors who provide a tremendous boost to the region's economy.



"While a diversity of people — from farmers to retirees — live along Delmarva's coastal bays, they are united in their concern for the bays' welfare," says Jim Falk, Delaware Sea Grant's marine recreation and tourism specialist. "We found that 82 percent would participate, or are currently participating, in programs to help protect and conserve the bays."

Falk, who conducted the survey, found that three environmental issues were of most concern to the residents: water quality, protection of drinking water, and loss of fish and wildlife habitat. He also found that almost two-thirds of the respondents would support paying more taxes or higher prices to finance bay improvements.

Almost 70 percent of the respondents named agricultural runoff as a serious threat to water quality. Nearly as many (67 percent) cited sewage treatment plant discharges; 50 percent worried about the environmental effects of tourism, and 47 percent were concerned about residential runoff.

Though respondents felt strongly that the tourism industry provides many worthwhile employment opportunities, they also strongly supported long-term planning by local government to control the negative impacts of tourism on the environment.

"Public concern about development activity appears to be highest in Delaware, followed by Maryland, and then Virginia, which correlates directly with the rate of growth occurring along the Delmarva peninsula," Falk says. "Our hope is that the survey results will be useful to state and county officials and planners in all three states as they develop management strategies for Delmarva's coastal bays."

The survey was distributed to 1,100 Delmarva residents, and 44 percent responded.

[For more information, contact Jim Falk, Delaware Sea Grant Marine Recreation and Tourism Specialist (Lewes, DE) at (302) 645-4235; e-mail: <mes.falk@mvs.udel.edu>.]

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## Lake Tahoe Stream Restoration Shines

by Dave Sanden, Davis California NRCS State Office

**EDITOR'S NOTE:** Adapted from *Current Developments in California* (April 1998). *Current Developments*, published by USDA Natural Resources Conservation Service, Davis, California, is available on the web at <<http://www.ca.nrcs.usda.gov>>. Click on Public Affairs.

Since the 1960s, the clarity of Lake Tahoe has been declining at alarming rate, but a successful restoration project along one of the lake's small tributaries now offers hope. Initiated to reestablish the filtering function of the mountain meadow/stream ecosystem lost to a dam decades ago, the Cold Creek stream restoration project reduces sediment and nutrient loading to Lake Tahoe.

A lake built in the 1950s to hold water for agricultural purposes destroyed the original ecosystem along Cold Creek and inundated the channel. Excess water, heavily laden with sediment from subdivision and highway construction, flowed into a diversion ditch, ultimately reaching Lake Tahoe. The diversion channel bypassed the filtering soils and vegetation of a 40-acre meadow, and sediment loads degraded the lake's clarity.

Things are different — and better — now. The project is so successful that scientists and water specialists from as far away as Russia have come to study its design and learn the secret of its success. Conservation experts believe that increased water monitoring, along with experience gained from the project, will provide a strong base for further stream restoration within the Tahoe Basin and throughout the Sierra.

With funding from the California Tahoe Conservancy, the NRCS restored the ecosystem by removing dams, reestablishing beneficial vegetation, and creating a mile of new stream channel using an innovative geomorphic design. Because of environmental constraints in the sensitive Lake Tahoe Basin, NRCS engineers and resource conservationists had to develop unique channel stabilization and vegetative transplant methods and use low-impact techniques for construction and transportation.

Working primarily during the dry season to keep soil dry and reduce sediment loading, the NRCS built temporary "haul roads" for accessing the site, using precedent-setting methods and materials to protect the soil and plants. Earthen roads consisting of six inches of soil placed over

filter fabric for distances of between one-fifth and one-tenth of a mile worked well, according to NRCS Resource Conservationist Jerry Owens. Also impressive was the performance of military landing mats— perforated sectional steel mats that distribute loads over greater areas.

“When these mats were pulled up at the project’s end ,” said Owens, “we saw no impact to soil or vegetation.” Another method employed to spare the site’s natural resources was the use of the emerging new stream channel as a temporary haul road.

“Meandering streambanks of the restored channel were stabilized with boulders and pine tree stumps,” said NRCS Civil Engineer Ken Christensen. “These structures were backfilled with soil and sod.” Whole willow roots, harvested from the site during excavation were recycled as streambank armor, offering immediate streambank stabilization and sprouting willow shoots that jump-started the revegetation process. According to Christensen, this method of streambank armoring provides good structural stability, a natural-looking appearance, and excellent fish habitat. Project staff also salvaged sod from the project site as they moved along, using it as needed to prevent erosion.

Now that the project is complete, “runoff from adjacent subdivisions that formerly discharged directly into Cold Creek is now filtered through 300 feet of meadow vegetation,” says Joe Thompson, NRCS District Conservationist for South Lake Tahoe. “The sinuous stream channel slows the water flow, allowing the deposition of any remaining sediment before the stream reaches the lake.”

“As a bonus, the restored meadow, with feeder channels flowing to waterfowl ponds, provides valuable habitat for wetland wildlife, and the restoration site serves as an outdoor classroom for students of all ages,” added Owens. “So far, more than a thousand people have studied this shining example of stream zone restoration.”

Next on the agenda is the restoration of an adjoining meadow along Trout Creek. NRCS staff will be relocating the creek to its historic flow path, reconstructing its floodplain, and enhancing habitat for the endangered willow flycatcher.

[For more information, contact Jerry Owens, USDA NRCS, 870 Emerald Bay Road, South Lake Tahoe, CA 96150. Phone: (530) 541-1490.]



**“Tech notes”**

describing the methods used during the Cold Creek project are available from Theresa Baily, USDA NRCS California State Office, 2121-C Second Street, Suite 102, Davis CA 95616. Phone: (530) 757-8224. Ask for California Agronomy Tech Note #43, “Salvage of Sod in Wetland Restoration” and Tech Note #44, “Transplanting Root Wads for Stream Restoration.”

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## **Notes on Watershed Management**

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### *New Management Policies Proposed for National Forest Road System*

With 373,000 miles of inventoried roads traveled by millions of vehicles each day, the National Forest road system dwarfs the federal interstate highway network in size, if not in traffic.

In January, the Forest Service announced proposals for both a long-term forest road management policy and a temporary road construction moratorium that includes most of the roadless areas in the National Forest System. The moratorium followed months of intensive lobbying by Northwest environmental groups eager to increase protection for areas that scientists believe are critical for the protection of water quality and fish and wildlife habitat.

Forest roads provide access for wildlife habitat improvement projects, maintenance of recreation facilities, fire suppression, law enforcement, search and rescue activities, timber harvesting, and the development of other resources. They also increase the chances of polluting streams and rivers.

Forest road maintenance often requires chemicals for dust suppression, deicing, and weed control. Vehicle accidents can result in spills of hazardous materials that can pose a serious threat to stream health. Roads that are not properly maintained may cause increased frequency of flooding and landslides, increased stream turbidity, and associated reductions in fish habitat and productivity.

The very existence of a road increases the opportunity for applications of pesticides and fertilizers that can degrade habitats along road edges. Roads also increase the nutrient and sediment delivery to streams.

### Ecological Benefits of Roadless Areas

- ✓ Critical habitat for rare, threatened, or endangered species
- ✓ Aquatic habitat for fish that cannot survive in logged areas because of heavy sediment flows to streams and rivers
- ✓ Air and water quality protection
- ✓ Recreation in roadless areas provides a higher quality of life
- ✓ Ecological controls for comparison of impacts from logged areas
- ✓ Ecological "blueprints" for restoring degraded forests

#### Roadless Areas Needed to Temper Growth

In the last few years, the public's use of national forests has changed, shifting from intense logging to intense recreation. An estimated 1.7 million vehicles associated with recreational activity travel on forest roads each day, over 10 times the traffic reported in 1950. To make matters worse, 60,000 "unofficial" miles of roads have been created through National Forests simply by repeated public use — and this number continues to grow every year. A new approach to managing the road system is clearly needed.

In addition, increased environmental awareness has spurred an increase in public concern and debate over conservation and ecologically sound forest management. A new forest road policy that includes a science-based forest road analysis process will help forest rangers make better management decisions, says the Forest Service.

The existence of a forest road in a particular area is not the central issue, according to Dennis Neill, Communication Lead for the Forest Service's National Road Policy Committee. It is, he says, "how that road is used and managed that makes the difference." Studies show that recently constructed roads are better designed and better located than older roads and result in fewer and less severe ecological impacts. The new policy should give managers a better idea of the long-term impacts of a decision to build, close, or repair a road in the National Forest System. Neill suspects that once the policy is in place, more attention will be focused on budget appropriations for watershed restoration and enhancement instead of battles over whether a road should be constructed or not.

#### Goals for the Long-term Policy

The agency identified three main goals for the long-term road management policy. First, fewer forest roads will be built and those that are built will minimize environmental impacts. Second, roads that are no longer needed or that cause significant environmental damage will be removed. Third, roads that are most heavily used by the public will be made safer and more efficient.

The new long-term road policy will help the Forest Service return to its original goal set forth in the Organic Administration Act of 1887 — to improve and protect the forests to "secure favorable conditions of water flows and to furnish a continuous supply of timber." The new policy will secure better protection and management of all the resources of the national forests, including timber, clean water, fish and wildlife, and recreation.

#### Interim Policy Calls for No Road Building

To ensure that forest health is not compromised while the long-term road management policy is being developed, the Forest Service issued a proposed interim regulation to temporarily halt road construction in most areas of the National Forest System that are not presently roaded. An estimated 33 million acres of roadless areas (in about 130 national forests) will be covered by the moratorium, which the Forest Service says will reduce logging levels by 100 to 275 million board feet in FY 1998. This reduction is less than 5 percent of the timber harvested from National Forests annually — "a mere drop in the bucket in terms of timber," says Neill. The moratorium is expected to begin this summer and last for 18 months or until the long-term policy has been finalized, whichever comes first. To date, the Forest Service has received more than 40,000 comments on the proposed interim policy.

[For more information, contact Dennis Neill, U.S. Forest Service, 740 Simms Street, P.O. Box 25127, Lakewood, CO 80225. Phone: (303) 275-5348; fax: (303) 275-5366; e-mail: <dneill/R2@fs.fed.us>.]

**EDITOR'S NOTE:** Adapted from *Keeping Current*, April 1998. Published by University of Wisconsin-Extension, Environmental Resources Center.

Mindy Habecker has spent much of the past decade helping people in Dane County, Wisconsin, learn how to protect water quality. As a County Extension Natural Resource Agent, she has conducted programs ranging from construction site erosion control workshops to teaching school children how to monitor the health of their local lakes and streams. This past year, she found herself moving in a new direction — helping local environmental groups renew their energy through strategic planning and capacity building.

"The first group that approached me was the Lake Waubesa Conservation Association. I worked with them to refocus their mission, develop new goals, and create a new set of action plans. They've organized committees around their action plans and are now tackling new projects. Our strategic planning exercise really reenergized the group."

Word got around and soon Habecker was approached by another group — the Nine Springs Network—dedicated to preserving a set of springs on the southern edge of Madison. Next, the Friends of Pheasant Branch Marsh approached her for assistance. Now, Habecker is conducting a series of strategic planning sessions with the Dane County Natural Heritage Foundation. Habecker observed, "These groups were all in similar spots. They were headed by a few energetic people who carried the load, and they wanted to reorganize their membership and find projects to get everyone involved."

### Top Five Tips for Encouraging Group Ownership

1. Have a frank discussion of the group's mission. Is it current? Is it on target?
2. Get the membership actively involved in planning goals — formulating what to do and how to do it.
3. Engage the total membership in "out-of-box" thinking exercises; get everyone's ideas on helping and hindering forces.
4. When it comes to implementation, determine where the members hearts are; or what moves them to action?
5. Assess what it takes to get members to participate in projects; for example, would more members come to a stream cleanup day if the organization provided baby-sitting services?

According to Habecker, when only a few people are actively involved, doubt arises as to whether the group's goals and vision are still valid for the whole membership. Habecker often tackles this type of nonprofit "burn-out" by taking the group through two three-hour sessions of exercises dealing with mission, goals, and action planning.

Initially, she has the group reexamine their mission statement. Then, group members spend five minutes generating ideas on goals or actions related to a specific issue. When all their ideas are listed, group members cluster similar goals.

Next, Habecker focuses the group's energies on setting priorities, with each member selecting their five most important issues. The top "vote-getters" are ranked again, this time by the group as a whole.

The second session involves group members in action planning. Groups of four to six people break off to examine a single goal. Habecker frequently uses the "force-field" technique, in which people list "helping forces" and "hindering forces" for accomplishing each objective. The lists, especially the "helping forces," are valuable resources for the organization to use later when the group begins developing the who, what, where, where, and how of implementation.

Habecker encourages organizations to develop goals that are specific, action-oriented, and reflect the group's mission. She also likes to see organizations allocate their plans between short and long-range goals. It's important for morale, she says, to succeed in short-term projects while plugging away at more distant goals. And, she advises organizations, if one member of the group has a burning desire to accomplish something not ranked high on the goal list, it might just be worth another look. After all, she points out, the members are the energy source for any nonprofit; if their enthusiasm isn't tapped, it may disappear.

Habecker uses the Learning Institute, developed jointly by the University of Wisconsin Extension and the Society for Nonprofit Organizations, as a source of information about board development, fundraising, social entrepreneurship, and volunteer recruitment.

"I've found that the Learning Institute program leaders have lots of field experience in working with nonprofits, and they really help local groups increase their impact by maximizing their available resources," says Habecker. "Our local nonprofit groups are increasingly vital in setting the public agenda and influencing government policies." This trend, according to Habecker, is

The Learning Institute offers satellite courses for nonprofit organizations across the country. They are available through Public Broadcasting System Adult Learning Centers around the country. Citizen watershed groups may find the following courses useful in expanding their organizations' effectiveness.

- ✓ Strategic Planning — Charting Your Course (September 17, 1998)
- ✓ Resource Development — Unleashing Community Generosity (October 15, 1998)
- ✓ Board Development — Building Passion for Mission (November 19, 1998)
- ✓ Marketing is Everyone's Business (January 21, 1999)
- ✓ Financial Empowerment — More Mission for Your Money (February 18, 1999)

- ✓ Social Entrepreneurship — Merging Mission and Money (March 18, 1999)
- ✓ Attracting and Keeping the Best Volunteers (April 15, 1999)
- ✓ Strategic Alliances — Extending Your Reach (May 20, 1999)

Excellence in Nonprofit Leadership and Management is a certificate program developed by the Learning Institute for Nonprofit Organizations in partnership with PBS Adult Learning Service, and others. All programs will be held on the third Thursday of the month from 12:30 - 3:30 (Central Daylight Savings Time for the September, October, April, and May programs; Central Standard Time for the November - March programs). For locations of downlink sites, call PBS at (800) 257-2578 or visit their website: <<http://www.PBS.org/als>>.

growing, along with an increase in community-based natural resources management. "It behooves us to respond to local government and the nonprofit sector's changing educational needs."

[For more information on Dane County University Wisconsin Extension, contact Mindy Habecker, 1 Fen Oak Court, Room 138, Madison, WI 53718-8812. Phone: (608) 224-3718; e-mail: <[habecker@co.dane.wi.us](mailto:habecker@co.dane.wi.us)>. For more information on the Learning Institute, contact Peter Coolson, 6314 Odana Road, Suite #1, Madison, WI 53719. Phone: (800) 214-8326; fax: (608) 274-9978, or e-mail: <[linst.@danenet.wictp.org](mailto:linst.@danenet.wictp.org)>.]

## Urban Notes

### Ultra-Urban BMPs Get the Third Degree

Washington State commuters who travel on Interstate 5 this fall will find themselves in the middle of a first-of-its-kind experiment in which BMP developers will pay to have their stormwater treatment technologies installed and evaluated by a panel of experts. The Washington State Department of Transportation (WSDOT) will test the performance of ultra-urban stormwater BMPs on Interstate 5's highway runoff.

Interstate 5 traverses an area that stormwater experts describe as "ultra-urban" — it has an extremely high percentage of paved surfaces; runoff polluted with floatables, metals, sediment, oil, and gas; and very high property values that limit the land area available for BMPs.

The Interstate 5 experiment is the creation of WSDOT and the Environmental Technology Evaluation Center (EvTEC) of the American Society of Civil Engineers' Civil Engineering Research Foundation. Through a cooperative agreement, EPA and the Civil Engineering Research Foundation established EvTEC as a private sector program for the advancement of innovative environmental technologies.

Multiple organizations and experts collaborate in EvTec's BMP verification process, which enables public agencies to participate in testing state-of-the-art treatment methods. Results are provided to public works agencies across the country.

#### Highway Runoff Is Ultimate Target

To accommodate the program, WSDOT is building a 25-acre testing facility at an outfall near Interstate 5, the most heavily traveled roadway in the state of Washington, at a cost of \$300,000. More than 200,000 vehicles traverse Interstate 5 daily, between Olympia and Seattle, leaving behind floating debris, sand and road deicers, metals, oil, gas, and other contaminants. Compounding the damage, 98 percent of the watershed is covered with impervious surfaces.

In this challenging environment, untreated stormwater runoff will be split into segments for a side-by-side comparison of four different BMPs. The test areas will receive about one cubic feet

per second of water each and flows will be adjusted to permit sampling under minimum and maximum flow conditions to simulate naturally occurring conditions in the Puget Sound Region.

#### Experts Scrutinize BMPs

To select the BMPs and examine the performance tests, EvTEC gathered a technical evaluation panel of 18 to 20 experts from several state transportation departments, the Washington State Department of Ecology, EPA, the Federal Highway Administration, and various professional organizations and consultants. The panel will also develop the performance verification protocols used for the tests. Companies selected are required to pay for the costs of their own testing and evaluation, which will be determined before field testing begins.

Industry's interest in the program has been very high since the panel members are not only stormwater experts but also represent potential markets for the BMPs being tested. According to Eric Hjertberg, Program Manager for Water Resources at EvTEC, "this customer-based evaluation panel makes the project market-based and market-driven." He added that the approach allows technology owners a cost-effective means of demonstrating their products in an objective, credible program that is highly visible to key markets and decision makers.

In early June, the panel selected four nonmechanical BMPs that best fit the area's needs, ranging from infiltration devices to oil and grease separators. The technologies selected belonged to BaySavers, Inc., Mt. Airy, Maryland; CDS Technologies, Inc., Atlanta, Georgia; Stormwater Management, Inc., Portland, Oregon; and Vortech, Inc., Portland, Maine.

#### Technical Panel Asks All the Right Questions

As the experiment proceeds, the technical evaluation panel will ask the following questions:

- Does the BMP perform as claimed or intended?
- How does the BMP perform in relation to key environmental parameters?
- Is the BMP easy and safe to use?
- What are the specific regulations and other approvals required for implementation?
- Does the BMP require frequent or significant upkeep?
- Is the BMP cost-effective in ultra-urban settings?

Testing will begin in August and last 8 or 9 months, during which traffic should move (or not move) as usual, but Washington commuters can perhaps take comfort in the fact that their daily commute will be a little cleaner.

[For more information, contact Eric Hjertberg, EvTEC, 1015 15th Street, NW, Suite 600, Washington, DC 20005. Phone: (202) 842-0555; website: <[www.cerf.org/evtec](http://www.cerf.org/evtec)>.]

### Ultra-Urban Areas Cause Ultra-Headaches

"Ultra-urban" is the new buzz word when it comes to big city pollution. Three characteristics set ultra-urban areas apart from the average city—lots of impervious surfaces, high property values, and characteristically "urban" pollution.

Parking lots, roads, and sidewalks can cover nearly 100 percent of ultra-urban land, decreasing the length of time it takes for runoff to reach receiving waters and preventing rain and snowmelt from slowly percolating into the ground.

Significantly, ultra-urban property is very costly and is in high demand. Landowners — whether federal, state, or private — can rarely afford to use land-hungry BMPs like detention ponds, swales, or wetlands, requiring innovative technologies to solve nonpoint source problems.

Ultra-urban runoff is dominated by heavy metals, oil and grease, litter, and road salt.

## Chesapeake Bay Area Businesses Become Environmental Mentors

Microsoft helping Netscape? GM lending Ford a helping hand? Such behavior would certainly raise an eyebrow in the hotly competitive world of mega-corporations, but of late, it's not unusual to see such cooperation between businesses in the Chesapeake Bay watershed. As a volunteer pollution prevention mentor, Baltimore Gas and Electric (BGE), Maryland's largest utility company, is one of more than 50 volunteers helping other businesses in need of technical assistance to reduce pollution generated by their day-to-day operations.

Through Businesses for the Bay, a voluntary program run by the Chesapeake Bay Program Office, BGE helped a nearby county newspaper printer develop a spill prevention plan to

reduce its risk of accidental spills and suggested ways to safely and quickly cleanup spills should they occur.

Steve Farkas, Businesses for the Bay coordinator for BGE, received the program's first Mentor of the Year award from the Chesapeake Executive Council (the governing body for the Chesapeake Bay Program). The Council recognized Farkas as instrumental in working with business and industry leaders to design and promote the mentoring program. "What we've accomplished through Businesses for the Bay can be used as a national model of industry commitment to pollution prevention," said Farkas. Carol Browner, Administrator of EPA and Council Chair pointed out that Farkas's efforts "have helped to protect and restore the Chesapeake and its living resources."

In addition to offering technical assistance to other businesses, mentors contribute by recruiting other businesses into the program, speaking at local trade conferences or town meetings about their role in Businesses for the Bay, hosting a technical workshop or small business roundtable, or providing in-kind services such as printing or graphic design.

O'Sullivan Corporation, which makes flexible vinyl products for the automotive, medical, and office product industries, has been involved in the program since it began. In addition to acting as a mentor, O'Sullivan Corporation has saved thousands of dollars by pursuing a waste minimization policy in each of its facilities as part of the Businesses for the Bay Program. Jeff Rezin, Director of Corporate Environmental Affairs for O'Sullivan Corporation, has found that "being creative when it comes to pollution prevention not only helps save the environment, it can also save your company money."

Businesses for the Bay has been a success because "it is a program developed *by* businesses for businesses," explains program coordinator Kelly Mecum. More than 145 businesses in the Bay watershed have volunteered to participate either as a mentor or by reducing pollution generated by their business. Participants include chemical manufacturers, marinas and shipyards, printers, and utilities. Most now practice preventative maintenance on their equipment to avoid spills and leaks, conduct regular assessments to identify pollution prevention opportunities, develop and implement programs to recycle commonly disposed of materials, or serve as business-to-business mentors. Small businesses will also be targeted this year through a series of Small Business Roundtables.

Businesses for the Bay staffers hope the roundtables will help them learn how to tailor the program to the small business community and how to assist them with pollution prevention program development. Small businesses are prime candidate for the mentoring program because they generally lack the resources and technical expertise needed to develop successful pollution prevention programs.

Businesses for the Bay asks industries, commercial establishments, and businesses in Maryland, Virginia, Pennsylvania, and the District of Columbia, to implement pollution prevention measures in their daily operations and voluntarily reduce chemical releases to the Bay and its tributaries. Along with the satisfaction that comes with a cleaner Bay, businesses like BGE enjoy cost savings from reduced waste management, positive publicity, increased patronage, and eligibility for the Chesapeake Executive Council's Businesses for the Bay Excellence Awards. Program staff hope to have a large majority of businesses in the Chesapeake Bay watershed involved in the program by the year 2000.

On April 21, 1998, Businesses for the Bay hosted a Mentor Luncheon in Richmond, Virginia, where businesses that have already committed to working as mentors for the program met to discuss a strategy to get other businesses involved. Each of the mentors received a mentor toolkit containing a slide presentation on the program that can be presented to various audiences and a list of businesses in their area that may need their assistance. Mentors also received sample press releases about the program and sample articles they can use as guides for company press releases and annual reports.

Maybe doing business in the Chesapeake Bay watershed isn't quite the same as the sizzling, "take-no-prisoners" world of big business, but the kinder, gentler atmosphere that prevails here should certainly yield gains for the Bay itself.

*[For more information, contact Kelly Mecum, Businesses for the Bay Program Coordinator, Chesapeake Bay Program, 410 Severn Avenue, Suite 109, Annapolis, Maryland 21403. Phone: (410) 267-5777.]*

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## *Gasoline Additive a Mixed Blessing — MTBE Finds an Unwelcome Niche in U.S. Waters*

With a touch of environmental irony, the very chemical that has helped the United States meet increasingly stringent air quality standards is now turning up as a contaminant in its waters. MTBE (methyl tertiary-butyl ether), a gasoline additive long used as an octane-enhancing lead substitute, and more recently to lower emissions, has been found in surface and ground water resources. Its presence raises questions about health risks and contributes to taste and odor concerns. In response, EPA issued a revised draft advisory on MTBE in drinking water in December 1997.

Volatile, flammable, and highly soluble in water, MTBE is volatilized to the atmosphere from gasoline production and refueling activities and from incomplete combustion in automobile engines. It then dissolves into atmospheric moisture and returns to the land surface in precipitation. Since MTBE does not sorb strongly to organic matter in soils, it is easily washed or leached away. In surface waters, MTBE quickly volatilizes back into the air; however, once dissolved in ground water, MTBE molecules travel quickly and freely — and persist much longer than other petroleum constituents.

Since the passing of the 1990 Clean Air Act Amendments and the inception of EPA's 1992 Oxygenated Fuel (Oxyfuel) and 1995 Reformulated Gasoline (RFG) Programs, use of MTBE as a fuel oxygenate has increased steadily due to its relatively low cost, ease of production, and desirable blending characteristics. MTBE was the second-most-produced organic chemical in the United States in 1997 and is currently used in 84 percent of the nation's oxygenated fuel supplies.

Oxyfuel and RFG Programs require a minimum oxygen content in gasoline to reduce carbon monoxide emissions and ozone formation in localities that do not meet the national ambient air quality standards. When MTBE is used as the oxygenate, its concentration in the gasoline ranges from 11 to 15 percent by volume. According to the EPA, 32 mostly urban areas in 18 states, accounting for one-third of the gasoline sold nationwide, are currently participating in the Oxyfuel and RFG Programs.

### *Sources of MTBE*

MTBE contamination can be traced to both point and nonpoint sources. MTBE enters the environment through leaks and overflows in underground petroleum storage tank systems and pipelines or from spills on land, emissions to water from motorized watercraft, and atmospheric deposition (via evaporation of ground sources).

Releases are often seasonal, according to Barbara Corcoran of EPA's Office of Water. MTBE levels in lake waters increase during the summer months because of recreational watercraft use, she noted. Conversely, many cities use oxygenated fuels only in the winter, making that season a prime time for land surface spills and evaporation. The EPA advisory notes that occurrences of ground water contamination observed at or above the advisory levels (20 to 40 micrograms per liter) have so far been attributable to point sources.

### *The EPA Advisory*

Health effects of consuming MTBE in drinking water are not documented; however, EPA considers human health risks possible because laboratory tests on animals have resulted in cancer and noncancer effects at high exposure levels. MTBE's unpleasant taste and odor make its presence in drinking water obvious to most people, and EPA has concluded from available studies that keeping concentrations in the 20 to 40 micrograms per liter range averts unpleasant taste and odor. Because these concentrations are 20,000 to over 100,000 times lower than the range of exposure levels in which health effects were observed in rodents, the advisory asserts that control levels for taste and odor acceptability will also protect against potential human health effects.

### *Risks*

Reports of low levels of MTBE in ground water have raised EPA's concerns about the safety of ground-water supplies. A 1995 NAWQA program study found the contamination occurring primarily in shallow ground water underlying urban areas. Because most public water systems



draw their water from deeper supplies, MTBE contamination of drinking water is deemed unlikely.

In the majority of cases, MTBE has not been a concern in surface waters. Corcoran observed that when MTBE contaminates surface water, the diluted concentrations of the volatile compound quickly evaporate. Flow velocity, water depth, and water temperature influence the rate at which MTBE volatilizes. MTBE will persist longer in slow, sluggish rivers and reservoirs, noted John Zogorski of the NAWQA Program.

Nonetheless, MTBE in public water supply reservoirs is one of the top three water quality concerns associated with the use of MTBE in gasoline, said Zogorski. In some cases, MTBE is accumulating to concentrations at or just above that recommended by the EPA Advisory. MTBE volatilizes during the winter season, so no significant long-term build-up of MTBE has occurred in these systems, added Zogorski. However, because of potential health concerns, California and Nevada are proposing new restrictions on MTBE that are more stringent than the EPA's current advisory limits.

Despite ongoing concerns, EPA affirms that the health benefits of cleaner air as the result of MTBE use far outweigh the potential risks from drinking water contamination. Many aspects of MTBE contamination and health risks remain uncertain, however. EPA will continue to investigate the consumption of MTBE in drinking water and will issue a final health advisory when adequate data are established, according to the agency.

[For more information, contact John Zogorski, Project Chief, VOC National Synthesis, National Water Quality Assessment Program, U.S. Geological Survey, 608 Mt. View Road, Rapid City, SD 57702. Phone: (605) 355-4560, x214. Email: <jszogors@usgs.gov>.]

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## Notes on Agriculture

### *Seco Creek Demonstration Project — Rangeland BMPs Protect Edwards Aquifer*

In the semiarid Texas hill country overlying the Edwards Aquifer, a quiet creek can morph overnight into a torrent 60 feet wide, only to round a bend and vanish just as suddenly down a rocky sinkhole. Such scenes astound the uninitiated and dramatically illustrate the intimate relationship between the region's surface water and ground water resources. That link is the impetus for the USDA's Seco Creek Water Quality Demonstration Project.

The nonpoint source pollution problems that elsewhere threaten as not-so-distant rumbles here assume great urgency. Over 1.5 million people, including San Antonio's entire population, tap the Edwards Aquifer for drinking water. But the area's karst characteristics make the aquifer vulnerable to pollution. Sediment loads can clog the limestone sinkholes and myriad cracks and crevices that allow surface water to recharge the aquifer. Through the same routes, nutrients, bacteria, and chemicals can rapidly and directly enter ground water without the filtering benefits of forgiving terrains.

The Seco Creek Project is a cooperative effort by the USDA-Natural Resources Conservation Service, Texas Agricultural Extension Service, USDA-Farm Services Agency, and the Texas State Soil and Water Conservation Board.

Since 1991, the Seco Creek project has addressed a broad array of land uses spanning its 170,000 acres, but with range covering 88 percent of the watershed, rangeland BMPs are a primary focus.

#### *Rangeland Residents Face Challenges*

Although much of the grazing land is still managed on a large scale basis, clusters of "ranchettes" are popping up across the range. Three to ten acres in size, these residential operations belong to a new class of rancher — the suburbanite who keeps a few horses and other livestock. Largely unfamiliar, at least initially, with such details as grazing management and septic systems, Seco Creek's ranchette owners have been receptive to assistance and information, according to Texas Agricultural Extension Service project leader Mark McFarland. New residents often seek out project staff for assistance. Many are surprised to learn that their thickly wooded 10-acre ranch is incapable of supporting even one grazing animal. Most new residents arrive with an appreciation of the land and a desire to restore it to a pristine condition,

says McFarland. "The challenge is to make them aware of the complexity and fragile interconnected structure of the system. If we can get the idea across that activities on their property impact the entire system, we have made a lot of progress in environmental protection."

Traditional ranchers are also challenged to manage the land not only for grazing but for water quality. Ashe juniper is perhaps the most persistent challenge. Naturally occurring fires once held the thirsty, invasive plant at bay, but fire suppression and decades of overgrazing have allowed the shrub to overtake vast areas of the region, seriously impacting aquifer recharge. According to McFarland, more than one million acres of the catchment and recharge area of Edwards aquifer are severely infested with ashe juniper. The dense, shrubby evergreen canopy of this species, along with the dry duff layer that accumulates beneath the tree, intercepts as much as 80 percent of the annual precipitation before it reaches the soil, sending most of the water back into the atmosphere as water vapor.

### Some of Seco Creek's On the Ground Accomplishments:

- ✓ BMPs have been implemented on 82 percent of the rangeland, 75 percent of the cropland, and 95 percent of the pastureland in the project area.
- ✓ Pesticide use has been eliminated on 29,491 acres by application of mechanical treatments and controlled burning for brush management.
- ✓ More than 180,000 feet (34 miles) of cross-fencing has been installed to improve grazing distribution and protect water quality.
- ✓ Installation of Low Energy Precision Application irrigation systems has improved water use efficiency by 20 percent on cropland.
- ✓ Nutrient management programs have reduced runoff and leaching losses by 27 and 40 percent, respectively.
- ✓ Conservation practices have reduced sediment losses by 80 percent on rangeland and 20 percent on cropland.
- ✓ Herbicide applications have been reduced by 100 percent on 15,708 acres of rangeland.
- ✓ Grazing management has improved vegetative cover and quality, which enhances water infiltration and reduces sediment movement, on more than 100,000 acres.
- ✓ Sediment loading has been reduced by 250,000 tons since 1990.
- ✓ Buffalo grass, a native stoloniferous grass species suitable for areas without excessive shade or traffic, has been demonstrated to provide attractive lawns with only an estimated 22 to 78 percent of the water consumption of the traditional St. Augustine grass.

Precipitation that does penetrate the soil is quickly sucked up by the extensive root system of the juniper before it can be used by beneficial grasses or percolate to the aquifer. Grazers generally disdain juniper, and without the lightning-strike blazes of old to control its spread, ashe juniper threatens to take the range for its own.

Now, the fires are back on a limited scale as "managed burns" — a rangeland BMP. Rancher Scott J. Petty recently conducted a 300-acre burn. "No matter how many times you've done it or how much you've studied it, a burn is always scary," he said. Fortunately, Petty received on-site technical assistance from the county Extension and the Seco Creek Project office on where to put the fire lanes and how to judge the weather condition and fuel load. Despite a degree of risk, Petty is an advocate of prescribed burns under the right circumstances because, he says, it "helps get old dead growth off the land and opens up the range so that grasses can grow."

### Successful BMPs Abound in Project Area

Petty also practices other BMPs on his 3,500-acre ranch. He uses rotational grazing to feed 2,500 beef cattle and 3,000 fallow deer. He is planning a pasture of native grasses along the creek and an alternate watering system to draw cattle away from the creek's banks.

Such practices are already in place elsewhere in the project area, in what might be described as a grazing incentive program for cattle. Water, salt, and shade — the necessities of bovine life — are strategically placed away from riparian zones and springs, drawing livestock away from sensitive areas. More than 150 new water locations have been established since the inception of the Seco Creek Project, and success is readily apparent in the recovery of vegetation, the healing of overgrazed riparian areas, and more evenly grazed pastures. A surprising benefit of this practice, notes McFarland, is the number and variety of wildlife that also use these remote watering locations.

NRCS Project Manager Phillip Wright is currently promoting a new technique for landowners to monitor BMP effectiveness. Participants use cameras and "Photopoints" to document carefully selected sites in a pasture before, during, and after BMP implementation. Landowners using this technique can review the photos and see the benefits of their actions.

Petty has been using the system on his ranch for some time. "Your memory can fool you," he says. "I put posts in the ground and take pictures before, during, and after a prescribed burn. That way I can see if it really helped or ways to make it work better the next time."

Between 70 and 85 percent of the land in the project area is managed with BMPs voluntarily implemented by large and small landowners alike. "There's a different intensity of involvement," Wright points out. "Someone who is doing management practices on 500 acres has a significant investment and can benefit from cost-share. The smaller landowner incurs a comparatively smaller cost, but may require more technical assistance. Both groups have excellent representation in the project."

"One of the roles we play," adds Larry Allen, Seco Creek resource manager, "is to demonstrate scenarios where technologies are feasible both economically and ecologically." For

example, a catchment and recharge structure built near a creek allowed an additional 650,000 gallons or almost two acre-feet of water to recharge.

What's two acre-feet compared to an aquifer containing 45 million acre-feet? "Think of the ultimate result of putting in 100 or 500 of those structures," says McFarland. "Even a few additional acre-feet of sustained recharge can have a huge benefit for getting through a dry spell without triggering mandatory water conservation measures for San Antonio residents and still maintaining required spring flows for habitat protection. Furthermore, if a rural water supplier charges \$1.28 per 1,000 gallons and you value the recharge water at the same rate, the site would pay for itself in about 2 years." The solution to meeting the region's water needs, McFarland conjectures, may lie in many small, inexpensive, and environmentally compatible measures, rather than a few very expensive water projects.

Similarly, a single grassed filter strip between a cultivated field and a stream can increase infiltration more than 50 percent and reduce erosion by 95 percent. And selective brush management on one eight-acre plot actually resulted in a 20 percent increase in spring flow — an increased water yield of 35 gallons per acre per year during a drought. A host of demonstration sites in the project have achieved such successes, but Wright, Allen, and McFarland are thinking bigger. "We've done a lot of this small-scale work and it's been successful," they note. "But what if we were able to apply these practices on 2,500-acre watersheds?" Even better, they speculate, what about *two* watersheds — one with BMPs, one without?

### *Project Expansion Possible*

That dream may soon be a reality. The Seco Creek project, which won the Governor's Award for Environmental Excellence in the agriculture category, has developed a reputation for building partnerships and fostering consensus on resource management issues. Public and private parties have expressed a desire for an expanded program reaching more areas. A proposed 10-year project would extend to "satellite" locations in the 13 counties of the Edwards region.

If funded, the Seco Creek-Edwards Regional Water Partnership would be a collaborative, multidisciplinary, and multiagency effort addressing regional resource management and land use concerns, with water the unifying issue.

Given the success of the original Seco Creek Demonstration Project, the new Seco Creek-Edwards Regional Partnership promises to extend the good work over a much larger area to ensure the continued quality and quantity of the water in the Edwards Aquifer.

[For more information, contact Phillip Wright, USDA-Natural Resources Conservation Service, 1616 Avenue M, Suite 100, Hondo, TX 78861-1754. Phone: (830) 426-3198; fax: (830) 426-4491. Or contact Mark McFarland, Texas Agricultural Extension Service, 348 Soil and Crop Sciences, Texas A&M University, College Station, TX 77843-2474. Phone: (409) 845-5366; fax: (409) 845-0604.]

## **USDA Evaluates Communication and BMP Adoption in Demonstration Projects**

The recently published *Communication and Adoption Evaluation of USDA Water Quality Demonstration Projects* covers eight USDA Water Quality Demonstration Projects initiated in 1990 and rates the projects' early (1992-1994) performance in accelerating producer adoption of designated best management practices. Recommendations are given to improve outcomes at both the state project level and the USDA national program level. Copies of the report and the report's executive summary are available by writing to Plant and Animal Systems, CSREES/USDA, Washington, DC 20250-2220. The executive summary of the report is also available on the web at <http://www.nal.usda.gov/wqic/wgwq/demoeval.html>.

# Notes on Education

## Making a Difference Through Outreach

**EDITOR'S NOTE:** [Adapted from the Minnesota Department of Agriculture's *MDA Update* 6/2 (March/April 1998).]

### Water Quality and Lawn Care Tips

- ✓ Use regionally adapted, healthy plants that can absorb and filter rainfall, irrigation, and runoff from melted snow.
- ✓ Aim roof downspouts onto lawns and gardens to filter and absorb runoff.
- ✓ Keep grass clippings and leaves off streets, sidewalks, and driveways.
- ✓ Leave grass clippings on the lawn or compost them.
- ✓ Use fallen leaves as winter or summer mulch; or compost or shred them and leave on lawn.
- ✓ Keep lawn care products on the lawn and always follow label instructions.
- ✓ Clean up and reuse granular lawn care products that fall on streets, sidewalks, and driveways.

A study of the lawn care habits of Lake Harriet (Minnesota) residents before and after an outreach effort shows that education can change people's behavior and may have immediate benefits for water quality.

Although Lake Harriet has some of the highest quality water in the Twin Cities area, its quality has declined over time, with herbicides and phosphorus generating the most concern. During 1993 and 1994, the Lake Harriet Watershed Awareness Project saturated the 148-acre study area with billboards, brochures, and direct mailings of lawn care tips. Project staff, aided by volunteer Master Gardeners, surveyed residents of the urban community and monitored the quality of stormwater runoff before and after the educational effort.

Project staff are reluctant to draw cause-and-effect conclusions from a short project, but the results are inspiring. For example, stormwater samples revealed a decrease in average pesticide loads after the outreach activities: MCPA levels decreased 86 percent; Dicamba, 59 percent; 2,4-D, 58 percent; and MCPP, 56 percent.

The project revealed that residents of the study area apply significantly less lawn fertilizer than the University of Minnesota's recommended guidelines. Most said they would rather spot-treat weeds than apply herbicide to their entire yard or that they use nonchemical weed control methods. Most homeowners also said that the educational initiative had increased their understanding of how lawn care habits affect water quality.

However, results also show that the job is not yet finished. Residents still need to understand the following:

- Good water quality and a healthy lawn are compatible and can be accomplished by applying lawn care products in appropriate amounts, at the right times, and during suitable (or appropriate) weather conditions.
- Keeping leaves out of storm sewers can help reduce the amount of phosphorus carried to the lake in runoff water.
- Fall is the best season to apply fertilizers and lawn care products that control broadleaf weeds.
- Erosion, leaves, grass clippings, yard waste, pet waste, and rainfall all contain pollutants that can end up in lake water. (One popular billboard used in the study pictured a storm drain plastered with leaves and litter, emphasizing that stormwater is not filtered before it enters the lake.)

Project researchers discovered that neighborhood newspapers and direct mail have the greatest impact, and that messages that are quick and easy to understand are most effective in changing lawn care habits. These messages, they found, are best delivered over an extended period of time.

### Soils Make a Difference

An interesting point was raised by a sister project in the nearby Lake Alimagnet watershed, which is considered suburban when compared with Lake Harriet's urban setting. Master Gardeners found a difference in lawns in the two watersheds that may affect the amount of pesticides and fertilizers applied by residents. The average lawn in the Lake Harriet watershed has more than 6 inches of topsoil (the ideal lawn grows on a 4- to 6-inch layer of topsoil), while Lake Alimagnet lawns average only 3 inches.

According to Jerry Spetzman of the Minnesota Department of Agriculture, when new suburban homes are built, top soil is often removed and not replaced. Applied fertilizer then must substitute for nutrients that would have been available from the topsoil. Future research efforts may attempt to quantify how soil depths affect fertilizer applications.

Conducted by the Minnesota Department of Agriculture, the Minneapolis Park and Recreation Board, and the University of Minnesota Extension Service, this project was supported with funding from EPA's Section 319 Nonpoint Source Management Fund with matching funds from the state.

[For more information on the Lake Harriet Watershed Awareness Project, including a detailed report and samples of homeowner educational materials, contact Jerry Spetzman, Department of Agriculture, 90 West Plato Boulevard, Saint Paul, MN 55107-2094. Phone: (612) 297-7269; e-mail: <jerome.spetzman@state.mn.us>.]

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## Educational Resources Column

### VIDEO

■ **Community Water Education for Youth — Focus on Watersheds.** A video tape of the May 1, *Community Water Education for Youth — Focus on Watersheds* satellite conference is now available. More than 600 educators, water resource professionals, and agency personnel attended this two-hour event.

[The cost of the tape is \$45 and includes facilitator and participant packets, publicity materials, and the Educating Young People About Water resource guide on program planning and evaluation. It can be used as a training workshop for adults interested in involving youth in community water protection projects. To order, contact University of Wisconsin Cooperative Extension Publications, 630 West Mifflin Street, Room 170, Madison, WI 53703. Phone: (608) 262-3346. Ask for item No. VA1039.]

### CD ROM

■ **Splash!** A new interactive CD-ROM game on nonpoint source pollution has been developed by the University of Nebraska and others under a section 319 grant. Desdemona the dragonfly entertains and teaches kids about water quality and the environment. The players select areas in the watershed they want to visit: the farm, neighborhood, or city.

[The game, in full color with audio and animation, can be played on Mac, Windows 3.1, or Windows 95. For a preview, check out Desi at <<http://www.ctic.purdue.edu>>. For more information call (765) 494-9555 or e-mail <[ctic@ctic.purdue.edu](mailto:ctic@ctic.purdue.edu)>.]

### PUBLICATIONS

■ **Kids! Renew America.** This publication contains information about dozens of model environmental programs involving children. Free of charge. Funded by Kraft Foods and The Home Depot, it is available at <[http://www.crest.org/renew\\_america](http://www.crest.org/renew_america)> or write to Renew America, 1400 16th Street, NW, Suite 710, Washington, DC 20036. Phone: (202) 232-2252.

■ **Wacky Water Critters.** This booklet provides descriptive detail about water critter life including life cycles, what the animals eat, what tools they have to get food, how they adapt to water currents, how they get oxygen, and how they protect themselves. Two identification keys — "Key to Macroinvertebrate Life in the River" and a "Key to Life in the Pond," are included with the booklet to help people identify bugs. To order call (608) 262-3346. Ask for Extension publication number GWQ023.

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## Reviews and Announcements

### Publications

■ **Step by Step Guide to Facilitating a Community's Future Search Event.**

Responding to landowner concerns about the degradation of Token Creek, the Dane County (Wisconsin) Natural Heritage Foundation used a \$55,000 EPA Clean Water grant to involve citizens, improve water quality in Token Creek, and complement the efforts of local government agencies. The project and the process it used so successfully are detailed in *Step by Step Guide to Facilitating Your Watershed Community's Future Search Event: The Token Creek Watershed Project Case Study*.

Specifically, the Foundation used a "future search" forum to help diverse citizens discover their common watershed conservation priorities. Farmers, developers, business people, local government officials, educators, new suburban residents, and long-time landowners helped design the forum. The guide shows other organizations how to initiate this event.

[To order a copy of the guide, contact Jon Dore, Watershed Specialist, Dane County Natural Heritage Foundation, 633 West Main Street, Madison, WI 53703. Phone (608) 285-9797; fax (608) 251-8535.]

■ **Guidelines for Stream and Wetlands Protection in Kentucky.** Produced by the Water Quality Certification Program in Kentucky, this 52-page manual introduces the reader to the concepts of stream and wetland restoration. It discusses stream behavior, stream types, stream restoration, streambank erosion, riparian zones, and wetlands. Though one chapter deals specifically with water quality certification issues in Kentucky; the rest is applicable to any state. The document includes 59 photographs and seven appendixes, including an overview of hydrogeomorphic wetland functions, native plant sources, consultant listings, and a comprehensive stream restoration bibliography.

[To obtain a free copy of the guide, which was funded by the U.S. Environmental Protection Agency, contact Dru Hawkins or Mariam Wiley at the Water Quality Certification Section of the Kentucky Division of Water, 14 Reilly Road, Frankfort, KY 40601; or call (502) 564-3410. The document is also available on the World Wide Web at <<http://water.nr.state.ky.us/dow/guide.htm>>.]

■ **Water Quality: A Report of Progress.** Produced by the USDA's Working Group on Water Quality, this report describes some of the department's recent efforts and accomplishments in reducing agricultural nonpoint source pollution. It is available at <<http://www.nal.usda.gov/wqic/wgwq/progress.html>>.

■ **Community-Based Environmental Protection: A Resource Book for Protecting Ecosystems and Communities.** In increasing numbers, citizens across the country are concerned about the quality of the ecosystems in which they live. Indeed, the most successful restoration and protection programs are those in which local citizens help make the decisions about conditions in their city, river, or bay.

Prepared by EPA's Office of Sustainable Ecosystems and Communities (OSEC), within EPA's Office of Policy, Planning, and Evaluation, *Community-Based Environmental Protection* is designed to help people and agencies begin the process of bringing people together to find a consensus that best suits everyone. Packed with "how-to" information and interlaced with descriptions of 30 successful programs in various settings across the country, the document should prove useful to any community seeking a better environment.

Three appendixes include a directory of technical assistance with many references, addresses, phone numbers, and funding information, a glossary of terms, and an ecosystem primer with references to help the layman understand the basics of ecosystems.

[To receive a free copy, call the National Center for Publications and Information (NCEPI) at (513) 489-8190. Written requests may be sent by fax ([513] 489-8695) or mailed to NCEPI: 11029 Kenwood Road, Building 5, Cincinnati, OH 45242. Or e-mail: <[cbep.handbook@epamail.epa.gov](mailto:cbep.handbook@epamail.epa.gov)>.]

■ **Office of Wetlands, Oceans and Watersheds 1998 Publication List.** Published in January 1998, this updated list contains the latest documents produced in the Office of Wetlands, Oceans and Watersheds. Categories include Wetlands, Oceans/Coastal, Watershed Protection, Nonpoint Source, Data Management, Water Quality Assessment and Monitoring, and Bulletins. Each category, except Data Management and Bulletins, has two sections: General and Technical. General publications can be easily understood by lay readers; technical publications are scientific or regulatory in nature and require an understanding of the program area.

[To obtain a free copy of this catalog and the next three publications reviewed here, contact NCEPI, at the address listed in the previous entry.]

■ **Urbanization and Streams: Studies of Hydrologic Impacts.** Planners, engineers, water quality specialists, and government officials should find this study a useful introduction to the potential hydrologic impacts of urbanization on streams. This report summarizes a literature search to find and document physical impacts and indications of water quality problems. It cites the U.S. Geological Survey reports; American Water Resources Association publications; federal, state, and local agency reports; journal articles; conference proceedings; case studies; and consultations with experts.

[To obtain a free copy of this report, contact NCEPI. Request EPA 841-R-97-009.]

■ **Statewide Watershed Management Facilitation.** Number eight in the Information Transfer Series of the EPA's Watershed Academy, this document addresses statewide watershed management and the process of facilitating the development or reorientation of these statewide watershed programs. In the past few years, many states have decided to create new statewide watershed management frameworks or reorient existing water programs along watershed lines.

[This document is available (free) from NCEPI, or on the World Wide Web at <<http://www.epa.gov/owow/watershed/wacademy/its.html>>.]

■ **Section 319 Success Stories.** This second volume of Section 319 Success Stories (the first was published in November 1994) demonstrates the maturation of state programs. It is replete with many examples of improved fisheries, reduced loadings, and increased public awareness — each one the outcome of projects receiving section 319 funding. *Success Stories* contains approximately two stories per state and one story per territory and tribe.

[Order from NCEPI, or see <[www.epa.gov/owow/NPS](http://www.epa.gov/owow/NPS)>.]

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## Other Resources

■ **Video Features Adirondack Watersheds.** Filmed in the Adirondacks of New York State, *Adirondack Waters: Can We Keep Them Clean?* is a 30-minute introduction to watershed and water quality, watershed planning, and water quality protection.

[Available at cost for \$6 including postage. Contact the Resident's Committee to Protect the Adirondacks, P.O. Box 27, North Creek, NY 12853-0027.]

■ **Web Site for Volunteer Water Monitoring.** EPA Region 3 recently posted a Volunteer Water Monitoring homepage on the Worldwide Web at <<http://www.epa.gov/reg3wapd/3wp13/volmon/p1.htm>>. The site includes information on the triad of water chemistry, biota, and habitat and encourages a comprehensive approach to volunteer monitoring. It features numerous Region 3 photographs of aquatic conditions, along with hotlinks to NOAA weather volunteers, the hydrologic cycle, 305b reports, USGS water data, biological indicators, SAV, Pfiesteria, and TMDLs. Users will also find hotlinks to national postings of methods manuals, the national volunteer monitor directory, and the national volunteer monitoring newsletter.

A "Before and After You Monitor" page provides users with a "green communities" context and includes information on point source and nonpoint source programs and pollution prevention and restoration concepts.

The site also has about 300 downloadable bookmarks that are arranged topically for more extensive investigations. Major bookmark categories include Volunteer Water Monitoring and Protection, Water Monitoring, Hydrologic Cycle, Management, EPA Region 3, Educational Programs.

[Comments and suggestions on the site may be directed to <[weber.peter@epamail.epa.gov](mailto:weber.peter@epamail.epa.gov)>.]

■ **Mark Your Calendars for Watershed Training Course.** *Working at a Watershed Level*, to be held September 14-18, 1998, in Lexington, Kentucky, is sponsored by EPA's Watershed Academy, The Council of State Governments, and other federal and state agencies.

*Working at a Watershed Level* was developed by a consortium of federal agencies, state and local groups and private organizations to improve cross-agency and nongovernment watershed training. The course is designed as an introductory-level basic training program for personnel newly assigned to watershed teams, veteran scientists in need of a watershed refresher course, and members of citizens groups interested in a cooperative approach to watershed issues.

*Working at a Watershed Level* covers the principles of watershed ecology, system dynamics, assessment and analysis, planning methodologies, restoration/management techniques, public involvement strategies and outreach program development. The course provides a basic but very broad foundation for considering both ecological and socioeconomic issues in watershed work across a wide range of public and private organizations. One of the motivating forces for developing the course was the need for a more cooperative, coordinated approach to watershed management and a common orientation to the science and societal issues involved.

The Interagency Watershed Training Cooperative, composed of representatives from the EPA, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, Bureau of Land Management, Bureau of Reclamation, U.S. Forest Service, and the U.S. Army Corps of

Engineers, provided leadership for developing the course outline. The Council of State Governments, International City/County Management Association, Ecological Society of America and other partners helped design and implement the final curriculum. The cost is \$290 for one week of training.

[For more information, contact: Barry Tinning at (606) 244-8228; e-mail: <[btinning@csg.org](mailto:btinning@csg.org)>; website: <<http://www.epa.gov/OWOW/watershed/wacademy/interfed/shedcours.html>>.]

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## Reflections

### *Rollin' Down the River: Times They Are A Changin'*

by Carol Forshee, Senior Environmental Employee, U.S. Environmental Protection Agency

Strolling past a large window overlooking the Kaw River in an shopping mall in Lawrence, Kansas, my grandson (the one who always spots the birds) said, "Look! There's a bald eagle!" Sure enough, there on the branch of a tree right outside the window, perched the huge bird. Rare enough to see one at all, this one was so unbelievably close we could almost reach out and touch it. As we stood there, entranced, it swooped down to the river below and came up with a fish. It was an unforgettable event.

My mind went back 50-odd years to the days when I was a student at the University of Kansas in Lawrence-on-the-Kaw. In those days we never thought about eagles or the health of the Kaw — the bird was simply rare, and the river just *was*. No one gave any consideration to either one.

The Kaw will not be found on a map; officially it is named the Kansas River, but has always been fondly called the Kaw by residents. Asked why the Kansas River is called "Kaw," Gaylynn Childs of Geary County Historical Society said it may have been called Kaw first. "Kaw" means "People of the South Wind," and the local Indian tribe was called both Kaw and Kansa.

The Kaw is formed by the confluence of the Smokey Hills and Republican Rivers at Junction City. It winds its way past sandbars that abound with wildlife and between stately cottonwoods where eagles scan the river for prey. The river has been tamed by a system of dams and levees that were built to prevent major floods, but historically, it meandered between the bluffs of the Flint Hills where some of the last remaining tallgrass prairies still flourish.

In addition to dams built for flood control, the Kaw's wetlands have been drained for farmland and its sandbars dredged to provide sand for construction. The resources that historically protected the river are disappearing at the same time that human sources of pollution are increasing.

Runoff is collecting excess fertilizer and pesticides from agriculture and lawns, manure from livestock pens, chemicals and heavy metals from city streets. Treated sewage and industrial wastes are dumped into the river, and generating plants use the river for cooling. Water monitors are finding fecal coliform, cryptosporidium, giardia, and parasites — all these in a river that is the primary source of drinking water for nearly all major metropolitan areas along the river.

Hoping to turn the tide with knowledge, the Kaw Valley Heritage Alliance last year sponsored "Rollin' Down the River," the most extensive environmental education project ever undertaken in the Sunflower State. The festival began at the headwaters of the Kaw in Junction City, and moved 170 miles downstream to its confluence with the Missouri River at Kansas City, Kansas.

Festival planners were aware that most people who live in the Kansas River Basin don't really think about their connections to the river, how the river determined where their communities were established and the kinds of businesses that located there. Festival planners also knew that residents generally don't consider how their daily actions and decisions impact the river's water quality. The planners understood, however, that there is a great deal of interest in local history and heritage.

They used that interest to attract residents to festival programs and events that provided opportunities to learn more about the river's health. The festival's grand opening at Junction City, with a mounted color guard from nearby Fort Riley, included the launch of the first festival watercraft — a replica of a historic bull boat — made from hides stretched across a wooden frame. Downstream, at the Willard cemetery, visitors learned that the town was built after the original Uniontown was twice burned because of outbreaks of cholera. A representative from



Haskell Indian Nations University at Lawrence described early day Indians and the treatment they received at the hands of settlers. Other speakers recalled the eras of the Oregon Trail and the Civil War.

One of the local planners observed, "The festival gave us the opportunity to identify and honor our local heroes through our programs and events. It instilled a real sense of pride in our community." That was not all. Programs and events included demonstrations on controlling agricultural runoff, discussions on the benefits of maintaining riparian corridors, explanations of how pollutants get into ground and surface waters, and a review of the river's water quality history.

During the opening weekend, kids lined up all day for the most popular event — the wetland walk. Friends of Milford Lake set up stations along the trail where kids worked on wetland projects and, when they completed the trail, they received a t-shirt, small gifts, and a packet of information.

The Kaw Valley Heritage Alliance is supported by many organizations, one of which is EPA Region 7, represented by Greg McCabe, who summed up the reasoning behind the festival: "The philosophy of the Kaw Valley Heritage Alliance is that before people become interested in protecting and enhancing water quality, they must first become more educated about the importance of the resource and the need for protection."

No one thinks the festival should be held every year, but locals have decided to make every September "Kaw Valley Heritage Awareness Month." Planners have set the year 2000 for the next big river celebration. Who would have dreamed of such a thing 50 years ago?

What a difference the festival made in people's attitudes toward the Kaw River, and toward the environment in general! We older people grew up believing the river somehow purified itself, and some of us have had a hard time understanding that is not true. But we are all learning. First, we begin to see rivers and birds as valuable resources, and then to understand that we ourselves are the only ones who are able to protect those resources. After we gain the awareness, we begin to give the proud Kaw — and all our other rivers — the protection they deserve.

[For more information, contact Joyce Wolf, Kaw Valley Heritage Alliance, P.O. Box 4411, Lawrence, KS 66046. Phone (785) 840-0700. Or contact Greg McCabe, EPA Region 7, 726 Minnesota Avenue, Kansas City, Kansas 66101. Phone (913) 551-7709.]

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## **Datebook**

DATEBOOK is prepared with the cooperation of our readers. If you would like a meeting or event placed in the DATEBOOK, contact the NPS News-Notes editors. Notices should be in our hands at least two months in advance to ensure timely publication. This listing is available online at [www.epa.gov/OWOW/NPS/events.html](http://www.epa.gov/OWOW/NPS/events.html). A more complete listing is available on the NPS Information Exchange World Wide Web Site (see the box on page 1 of this issue for the address).

## **Meetings and Events for 1998**

### **August**

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- 2-7 *Rivers Curriculum Project Sixth Annual Summer Training*, North Park University, Chicago, IL and Southern Illinois University, Edwardsville, IL. Teachers will focus on six curriculum areas — biology, chemistry, earth science, geography, language arts, and mathematics. Courses are for those interested in working with water testing education. Contact Bob Williams, Rivers Project, Box 2222, Southern Illinois University, Edwardsville, IL 62026. Phone: (618) 692-3788; fax: (618) 692-3359; e-mail: <[rivers@siue.edu](mailto:rivers@siue.edu)>; website: <[www.siue.edu/OSME/river](http://www.siue.edu/OSME/river)>.
- 4-7 *Cross Currents in Water Policy — UCOWR 98*, Hood River, OR. Contact Tamiim Younos, Virginia Water Resources Research Center, 10 Sandy Hall, Virginia Tech, Blacksburg, VA 24061-0444. Phone: (540) 231-8039.
- 24-28 *Meeting on Water Quality Standards, Water Quality Criteria, and Implementation, including Water Quality-Based Permitting*, Philadelphia, PA. Contact The Cadmus Group at (703) 998-6862; e-mail: <[mrm98@cadmusgroup.com](mailto:mrm98@cadmusgroup.com)>; website: <[www.epa.gov/OWM](http://www.epa.gov/OWM)>.
- 31-9/4 *International IAWG Conference on Diffuse Pollution*, Edinburgh, Scotland. Contact Rosemary Plessis, Scottish Environmental Protection Agency, Erskine Court, The Castle Business Park, Stirling FK9 4TR, Scotland, UK. Phone: 44 01 786 457 700. website: <<http://www.sepa.org.uk/iawg/iawqconf.ht>>.

## September

- 14-18 *USDA-NRCS Training Workshop on Water Quality Monitoring*, Harrisburg, PA. One of a series of training workshops on water quality monitoring. For field personnel who are directly involved in a monitoring project and for other personnel responsible for providing technical assistance in the field. Registration can be made by e-mail: <gspiller@ftw.nrcs.usda.gov> or by faxing Georgia Spiller at (817) 334-5470.
- 14-18 *Working at the Watershed Level*, Lexington, KY. A comprehensive introduction to watersheds. Sponsored by the Council of State Governments with Watershed Academy support. Contact: Marcia Hensley at (606) 244-6182; e-mail: <mhensley@csg.org>.
- 15-18 *Minimizing Erosion, Sediment, and Stormwater Impacts — Protection and Enhancement of Aquatic Resources in the 21st Century*, University of Delaware. Sponsored by the Delaware Department of Natural Resources and EPA Region 3. Contact Robert Baldwin at (302) 739-4411; e-mail: <rbaldwin@dnrec.state.de.us>.
- 16-18 *Connections '98 — 2nd Annual Conference on Transportation, Wetlands, and the Natural Environment*, New Bern, NC. Contact Pam Cloer, CTE. C/O ITRE, NCSU, Box 8601, Raleigh, NC 27695-8601. Phone: (919) 515-7990; website: <http://itre.ncsu.edu/itre/C.E.>.
- 21-24 *Sixth National Nonpoint Source Monitoring Workshop*, Cedar Rapids, IA. Contact Lynett Seigley or Carol Thompson, Iowa Department of Natural Resources, Geological Survey Bureau, 109 Trowbridge Hall, Iowa City, IA 52242-1319. Phone: (319) 335-1575; fax: (319) 335-2754; e-mail: <lseigley@igsb.uiowa.edu> or <cthompson@igsb.uiowa.edu>.
- 21-25 *Working at the Watershed Level*, Seattle, WA. A comprehensive introduction to watersheds. Sponsored by the University of Washington with Watershed Academy support. Contact Bill Rogers at (206) 543-5539; email: <wjrogers@u.washington.edu>.

## October

- 3-7 WEFTEC '98, Orlando, FL. Contact Water Environment Federation, Attention: WEFTEC '98 Program Coordinator, 601 Wythe St., Alexandria, VA 22314-1994. Phone: (800) 666-0206.
- 20-21 *Agriculture and Water Quality in the Pacific Northwest — Understanding Each Other and Working Together for a Better Future*, Yakima, WA. Contact the Agriculture and Water Quality Committee, P.O. Box 1462, Spokane, WA 99210. Phone: (509) 838-6653.
- 20-29 *River Restoration and Natural Channel Design*, Pagosa Springs, CO. One of eight short courses presented by Dave Rosgen with Wildland Hydrology. Contact Wildland Hydrology, 157649 US Highway 160, Pagosa Springs, CO 81147. Phone: (970) 264-7120; fax: (970) 264-7121; e-mail: <wildlandhydrology@pagosasprings.net>.
- 21-23 *State of the Lakes Ecosystem Conference (SOLEC)*, Buffalo, NY. SOLEC is a biennial conference to report and seek comment on progress toward the goals of the Great Lakes Water Quality Agreement. Contact Paul Bertram, U.S. EPA, at (312) 353-0153 or Nancy Stadler-Salt, Environment Canada, at (905) 336-6271. Further information can be found on the web at <www.cciw.ca/solec> or <www.epa.gov/glindicator>.

## November

- 9-11 *The Science of Managing Forests to Sustain Water Resources*, Worcester, MA, offers both research and applied presentations on water quality and yield, silvicultural treatments, modeling, economic and social considerations, and international case studies. Contact Jim Taylor, Metropolitan District Commission, Division of Watershed Management, 20 Somerset Street, Boston, MA 02108. Phone: (617) 727-5274; fax: (617) 727-8301; e-mail: <jim.taylor@state.ma.us>.
- 11-13 *18th Annual International Symposium of the North American Lake Management Society*, Alberta, Canada. Contact Symposium Program Co-chair Al Sosiak at (403) 678-9856; e-mail: <asosiak@env.gov.ab.ca>. Or contact Everett Fee at (403) 678-9856.
- 15-19 *1998 Annual Conference on Water Resources & Symposia on Management of Human Impacts on the Coastal Environment and Applications of Water Use Information*, Point Clear, AL. Contact AWRA, Attn: 1998 Annual Conference & Symposia, 950 Herndon Parkway, Suite 300, Herndon, VA 20170-5531. Phone: (703) 904-1225.

## Calls for papers — Deadlines

- August 1 *Coastal Zone 1999*, July 24-30, 1999, San Diego, CA. Abstracts invited on the human dimension, the ocean realm, the watershed perspective, public connections or other topics related to coastal zone management. Contact Martin Miller, USACE Waterways Experiment Station. Phone: (601) 634-3999; fax: (601) 634-4314; e-mail: <miller@cerc.wes.army.mil>; Peter Douglas, California Coastal Commission. Phone: (415) 904-5201; fax: (415) 904-5400; or Chantal Lefebvre, Urban Harbors Institute. Phone: (617) 287-5577; fax: (617) 287-5575; e-mail: <Z99@mbsky.cc.umb.edu>.

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