



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

A Note from a Reader

Does the Name Fit?

A professional engineer from Landing, New Jersey, responded to issue #38's commentary by Michigan Governor John Engler with the following observation:

Our problem with recognition of the term "nonpoint source pollution" is that it does not accurately reflect what is intended — perhaps the concept would be more easily understood if it had been dubbed "water pollution/nonpoint source." We have to live with what was chosen, but perhaps it is not too late to mount a slogan campaign such as "Water pollution — we are the nonpoint source," after comic-strip character Pogo's revelation that "we have met the enemy, and he is us!"

Notes on the National Scene

Voluntary Nationwide Monitoring Strategy Proposed

Recommendations calling for fundamental changes in water quality monitoring programs have been proposed by the Intergovernmental Task Force on Monitoring Water Quality (ITFM), a three-year federal, state, and tribal partnership operating under the auspices of the U.S. Geological Survey's Data Coordination Program. This proposal is the ITFM's third report.

Prepared in collaboration with representatives of government and the private sector, the proposal's key elements include goal-oriented monitoring, using environmental indicators for aquatic resources, and flexible and comprehensive monitoring based on the conditions of the water, its uses and program goals.

Water quality data collected by public and private entities is, in many cases, not easily accessible to other users. Improved

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information automation, accessibility, and use as set forth in the ITFM strategy would overcome this barrier. Better assessment and reporting would also facilitate the sharing of results among resource assessment programs. Evaluating monitoring activities periodically would assure that these activities continue to meet their objectives effectively and economically.

The ITFM would also establish a National Water Quality Monitoring Council to promote agency implementation of this strategy nationwide. Under the proposal, the Council would provide guidance and technical support and serve as a forum for collaborative program planning. The U.S. Environmental Protection Agency and USGS Data Coordination Program would co-chair the Council.

The Council's ability to direct institutional collaboration would improve joint monitoring efforts at national, regional, state and tribal levels, thereby conserving available resources. More important, it would help ensure that comparable data of known quality is collected and integrated into a national database.

The proposed changes in water quality monitoring are intended to support sound decision making at all levels and achieve nationwide water quality goals to protect human health, preserve and restore ecological health, and sustain a viable economy. The changes are also expected to provide a better return on monitoring investments.

[For more information and copies of all ITFM reports, contact the U.S. Geological Survey, Office of Water Data Coordination, 417 National Center, Reston, VA 22092. Phone: (703) 648-5023; FAX: (703) 648-6802.]

USDA and EPA Sign Agreement to Reduce Pesticide Risks

Department of Agriculture Secretary Mike Espy and EPA Administrator Carol Browner signed a Memorandum of Understanding on August 15, 1994, committing their agencies to provide the agricultural community with pest management techniques and tools that will reduce pesticide risks to public health and the environment, while ensuring economically sound agricultural production.

The Memorandum of Understanding makes the following commitments:

- Within six months, EPA and USDA will jointly identify pesticides subject to potential regulatory action that might affect a farmer's ability to fight a pest problem.
- USDA will work with the agriculture and research communities to identify and develop alternative pest control methods.
- In looking for alternatives, the agencies will seek pest control methods that will significantly reduce risks to human health and the environment.
- When an alternative pest control method requires EPA registration, EPA will expedite its review of the application and take action in strict time frames.

Farm Bill Up for Reauthorization in 1995

A new version of the Farm Bill — the federal Food, Agriculture, and Trade Act of 1990 — must be reauthorized by the end of 1995. The new version is expected to address the future of land conservation programs, new water-friendly technologies, and the watershed approach.

The 1985 and 1990 Farm Bills introduced major changes in resource conservation policy through the addition of several programs: land retirement programs including the Conservation Reserve Program (for highly erodible lands) and the Wetlands Reserve Program. The Swampbuster, Sodbuster, and conservation compliance provisions prevent farmers from receiving farm program benefits if they farm in certain wetlands and highly erodible lands. In 1995, discussion may involve such topics as

- long-term retirement of environmentally sensitive lands: for example, riparian areas and habitats of threatened, candidate, and endangered species;
- research, education, and extension efforts to encourage widespread adoption of environmentally beneficial farming technologies;

- a watershed approach to conserving resources; and
- continued and expanded funding for environmental and conservation programs.

The Act must be reauthorized by December 31, 1995. *News-Notes* will keep you informed.

USDA Reorganizes

EDITOR'S NOTE: As several USDA agencies provide programs associated with, or complementary to, nonpoint source programs, many people involved in nonpoint source programs are interested in how the Department is responding to its reorganization authorization.

The USDA has embarked on a massive reorganization effort. On October 13, 1994, President Clinton signed into law the authorization implementing the restructuring of USDA headquarters, followed by a streamlining of the field staffs and offices. The top-down changes will eliminate 14 USDA agencies, close 1,274 field offices, eliminate as many as 11,000 positions, and save taxpayers \$3.6 billion over five years.

Headquarters Changes

At USDA headquarters, the Natural Resources Conservation Service (NRCS) has replaced the Soil Conservation Service. The "new" NRCS will administer all agriculture-related conservation programs, except those assigned to the (newly) Consolidated Farm Service Agency (CFSA).

CFSA combines the functions of Agricultural Stabilization and Conservation Service (ASCS), Federal Crop Insurance Corporation (FCIC), and the farm-lending activities of Farmers Home Administration (FmHA). FSA retains the administration of the Agricultural Conservation Program and the Conservation Reserve Program.

A new Cooperative State Research, Education, and Extension Service (CSREES) will ensure continuity in the successful federal-state-local partnership in research, education, and extension activities. This new agency was formed through the merger of the Cooperative State Research Service and the Extension Service. According to CSREES Deputy Administrator John Bottum, the reorganization should not affect Extension funding, nor is Extension included in the USDA plans to streamline field offices.

Field Service Changes

Many local USDA services to farmers will be consolidated in field service centers. According to the USDA, before reorganization, customers often had to visit as many as four different offices to participate in ASCS Federal Crop Insurance Corporation, SCS, Farmers Home Administration, and Rural Development Corporation programs. Besides instituting "one-stop shopping," USDA agencies will improve efficiency by slashing paperwork and sharing data between USDA entities, eliminating duplication of effort.

"These changes will result in a government that is more responsive to its customers," Secretary of Agriculture Mike Espy assured the Department as it embarked on these actions.

Notes on Riparian and Watershed Management

Phased BMP Implementation Key to Clean Water Success

An agricultural BMP project in southwestern Virginia's Middle Fork Holston watershed is succeeding in both stream and community environments. The project, the phased implementation of BMPs in Hutton Creek, has already improved conditions for the stream's biota and is slowly garnering the support of area farmers.

The project, now a prototype for TVA's Clean Water Initiative, originated locally. In 1984, citizens of the watershed expressed concern about the quality of the Middle Fork Holston River; turning for help to their water resource management agencies, they were surprised to learn how little was known about the river, which is used as a recreational fishery and water supply, and is a home to sensitive and threatened mussel species. Residents formed the Middle Fork Holston

Water Quality Committee and asked TVA's Water Management Group to help them review the river's condition.

Technology Helps Set Priorities

TVA used two innovative tools: medium-scale (1:2,000) color infrared aerial photography to identify land uses and potential nonpoint sources of pollution in the 240-square-mile watershed; and an index of biotic integrity (IBI) to assess the biological condition of several streams in the watershed and to indicate how nutrients, pathogens, sediment, or habitat losses affect aquatic life.

Hutton Creek, with an IBI score of 32, rated "poor" and was selected for a project demonstrating phased BMP implementation. The IBI pointed to nutrient and sediment inputs as major stressors on the stream's biota. The aerial inventory revealed that the creek had a high potential for agricultural NPS impacts from three sources: confined livestock operations, pastureland erosion, and livestock access to riparian areas.

Phased Implementation of BMPs

The project sets a realistic goal that the community can support. Since local streams are used more for bank fishing than for swimming, improving the fishery became a meaningful community goal. In addition, the strategy reflects a practical timeline for initiating federal and state programs. "The phased implementation strategy makes sense," says TVA's Renee Hurst. She explains that the project provides initial cost-share and technical assistance to farmers for practices that they readily accept, and gradually introduces more controversial BMPs.

Realizing that local landowners might resist streambank protection BMPs, TVA began with animal waste treatment practices.

Because land treatment projects need more lead time, TVA made soil erosion its second target. USDA took the lead on this component, and is currently addressing soil erosion on the agricultural lands in the Hutton Creek watershed (primarily overgrazed pastures).

In its final phase, the project focuses on streambank/riparian treatments. Native plantings and livestock exclusion are now being incorporated at sites within the Hutton Creek watershed that have other projects already in place. One such project is an ongoing 319 project to track BMP implementation in riparian areas. Because Hutton Creek has lost so much woody streambank vegetation, TVA anticipates that results from this phase of BMP implementation will take a long time to appear.

Getting Results

Indications are that the phased strategy is working. Farmers are now more willing to discuss livestock exclusion, and one Hutton Creek farmer independently implemented the controversial BMP on one of his farms in another watershed. With the implementation of manure

TVA's Clean Water Initiative

In the Clean Water Initiative program, water resource and community relations experts team up to promote water resource protection in each of the Tennessee Valley's 12 subwatersheds. River Action Teams (RATs) assess the condition of their watersheds and gather the people and resources needed to address priority water issues.

These unique teams

- take a holistic approach to water resource management, focusing more on resource needs than on particular sources of pollution, regulatory programs, or legislative requirements;
- develop strategies to balance land use and ecological integrity;
- consider the needs of all stakeholders in the design of regulatory and innovative nonregulatory solutions; and
- actively promote protection of the resource.

The fundamental role of River Action Teams is coalition building — seeking support from regulatory agencies, community leaders, business and industry, interest groups, and private citizens to develop and implement protection and mitigation plans. The plans may focus on public awareness, regulation, citizen action, landowner cooperation, or demonstration projects.

River Action Teams are currently at work in the Holston and Clinch-Powell watershed in Tennessee, the Hiwassee watershed in Georgia, North Carolina, and Tennessee; and the Wheeler-Elk watershed in Tennessee and Alabama.

management for over 200 cows, the creek's biological condition improved dramatically. Since 1990, the year after the last targeted animal waste site was treated, IBI scores have ranged between 48 and 52, for a "fair" to "good" rating. Stream biological condition continues to stabilize with land treatment, and recent sightings of rock bass, a species absent from the creek for many years, are an unofficial measure of the project's success.

Meeting Local Needs

According to TVA, the keys to improving water quality in the Middle Fork Holston watershed are the focus on gaining local landowner acceptance of agricultural BMPs and the pursuit of realistic and relevant goals set by the local Water Quality Committee.

The Middle Fork Holston Water Quality Committee has called attention to problems in the river through a broad range of education efforts, including field day tours of agricultural BMPs, pamphlets for self-guided tours, and a local water quality conference to increase public awareness of the river and its needs. Said Hurst:

Improved conditions in the Hutton Creek subwatershed and other parts of the Middle Fork Holston watershed are primarily the result of local initiative. By matching its technical support to local needs and actively promoting local involvement, TVA has been able to accomplish far more in the Middle Fork Holston watershed than it could on its own.

[For more information on TVA's Clean Water Initiative and River Action Teams, contact Renee Hurst, Tennessee Valley Authority, 400 West Summit Hill Dr., Knoxville, TN 37902. Phone: (615) 632-8503.]

Know Your Watershed Campaign Promotes Voluntary Local Partnerships

What do the American Farm Bureau Federation, Alpha Zeta Fraternity, the World Wildlife Fund, and the American Planning Association have in common? All are among more than 45 "National Partners" who have signed on to a new campaign to encourage the agricultural community's local watershed management efforts.

The campaign motivates local agricultural leaders to develop private-public partnerships to identify specific problems and promote sustainable natural resources within their watersheds. Such locally led planning efforts have great flexibility for solving natural resource problems and may reduce the need for regulation.

Says Bob Wayland, director of U.S. EPA's Office of Oceans, Wetlands, and Watersheds: "The campaign recognizes that the source of the problems is not limited to agriculture, and that solutions must be found by working within local watersheds to identify all pollution sources and take action in concert with all stakeholders in the watershed."

Coordinated by the Conservation Technology Information Center (CTIC), Know Your Watershed provides tools to help local residents and landowners establish grassroots watershed partnerships. When CTIC receives requests for information and assistance from local watershed groups, it sends "Watershed Alerts" to the network of national partners, who provide assistance through their local affiliates. Already, over 500 individuals and groups have requested help in networking with other local groups and motivating stakeholders.

Know Your Watershed is producing a series of guides for local watershed partnerships. The guides include

- "Getting to Know Your Local Watershed"
- "Building Local Partnerships"
- "Leading and Communicating"
- "Managing Conflict"
- "Putting Together a Watershed Plan"
- "Carrying Out a Watershed Plan"
- "Guide to Information and Resources"

Know Your Watershed Campaign (continued)

Other information includes the pamphlet, "What is a Watershed Partnership?" and three "awareness scorecards" to help landowners and others measure their knowledge of the environment: "Scorecard for Rural and Suburban Landowners"; "Scorecard for Farmers and Ranchers"; and "What is Your Ecological Quotient?"

The media are playing a major role in the initiative, and information about it has already reached more than 4.2 million farmers and ranchers. *Successful Farming*, *Farm Journal*, *Progressive Farmer* and other major farm publications support the initiative, and local TV stations are airing a video promoting the watershed approach. The video features Bob Perciasepe, EPA assistant administrator of water, Paul Johnson, chief of the Natural Resources Conservation Service (the former SCS) and Ray Brownfield, president of CTIC and Capital Agricultural Properties Services.

NRCS, EPA, and CTIC have also produced "Partnerships for Watersheds," a video highlighting watershed partnerships in Massachusetts, Ohio, Virginia, and Oregon.

[For more information, call Karol Keppy, Project Manager, Conservation Technology Information Center, 1220 Potter Dr., Room 170, West Lafayette, IN 47906. Phone: (317) 494-9555.]

Use CTIC Scorecard for Farmers and Ranchers

All Americans are concerned about their environment. However, we sometimes overlook many things that have a potential effect on water quality. The following questions offer the opportunity to build or confirm your level of awareness about the watershed in which you live.

- If you pressure rinse and recycle your plastic agricultural containers, give yourself **20 points**. Add **10 points** if you use returnable containers or dissolvable packaging.
- If you calibrate your spray equipment at least once a year, **+10 points**. For each additional time you calibrate your equipment each year, **+5 points**.
- If you use realistic yield goals when figuring fertilizer requirements for crops, **+10 points**. If you don't give fertilizer credits for manure and legumes, **-10 points**.
- If you mix or load chemicals and fertilizers within 200 feet of a well or waterbody, **-10 points**.
- If you collect and recycle used motor oil, **+10 points**. If you dump or spread used oil to control road dust, **-10 points**.
- If you scout your fields for pests (insects or weeds) before you apply pesticides, **+10 points**.
- If you have written a letter or placed a phone call in the past year to a legislator or public official about your watershed, **+20 points**.
- If you are a member or active in an agricultural or natural resource organization, **+10 points**. If you support educational programs for youth, **+10 points**.
- If you have been actively involved in a land use issue in your watershed over the last year, **+20 points**.

Total

Scoring:

- 90 and over:** You are a good friend to your watershed.
- 70 - 89:** You are aware and working hard for your watershed.
- 40 - 69:** You could do more for your watershed.
- Less than 40 points:** You need to become more aware of your watershed.

To order additional copies of this scorecard contact:
 Conservation Technology Information Center, 1220 Potter Drive, Room 170, West Lafayette, IN 47906
 Phone: (317) 494-9555
 FAX (317) 494-5969



KNOW YOUR WATERSHED National Partners

- | | |
|---|--|
| Ag Retailers Association | National Association of Wheat Growers Foundation |
| Ag Retailer Magazine | National Cattlemen's Association |
| Agri Marketing Magazine | National Conservation Tillage Digest |
| Alpha Zeta Fraternity | National Corn Growers Association |
| American Cyanamid | National Pork Producers Council |
| American Farm Bureau Federation | Progressive Farmer |
| American Farmland Trust | Purdue University |
| American Planning Association | Rumrill-Hoyt |
| American Soybean Association | Soil & Water Conservation Society |
| American Water Works Association | Soybean Digest |
| CMF&Z | Successful Farming |
| Calmers Agronomic Research Center | Tennessee Valley Authority |
| Capital Agricultural Property Services, Inc. | The Conservation Fund's Fresh Water Institute |
| Case Corp. | The Fertilizer Institute |
| Ciba Crop Protection | USDA Extension Service |
| Deere & Company | Forest Service |
| Dow Elanco | Natural Resources Conservation Service |
| DuPont Agricultural Products | U.S. Environmental Protection Agency |
| Farm Journal Publishing | U.S. Geological Survey |
| Farm Progress Companies | Water Environment Federation |
| Four Star Services, Inc. | World Wildlife Fund |
| Miller Meester Advertising | Zeneca Ag Products |
| Monsanto Agricultural Group | |
| National Association of Conservation Districts | |
| National Association of State Conservation Agencies | |

Neighbors along Creek Unite to Protect Water Quality

by Holly C. VanScoy, Ph.D., Chair, Bear Creek Watershed Steering Committee

Getting small groups of individuals or families united in a common cause is the moving force behind many lake associations. It is also the notion behind the proposed riparian clubs of the Bear Creek Watershed Project in Cannon Township — the fastest growing township of Kent County, Michigan.

The Bear Creek Watershed Project is a township-directed effort that receives 319 funds through the Michigan Department of Natural Resources. It creates and supports riparian clubs for streamside residents in the 20,000-acre watershed, which is rapidly changing from agricultural to residential land uses. Because Bear Creek is a subwatershed of the Grand River, which empties into Lake Michigan, the project is an important initiative for water quality in the Great Lakes region.

Project Manager Patricia S. VanDyke conceptualizes Bear Creek's riparian clubs as being similar in structure to the block clubs of urban neighborhoods:

Riparian clubs in the Bear Creek watershed would be comprised of families who live in certain contiguous areas along the creek and its tributaries. Individuals who share stretches of stream or streambank with one another often have common concerns or opportunities for stream improvement. Riparian clubs would provide an opportunity for them to get together to address these mutual interests and problem-solve collectively. Most important, it would provide them an opportunity to identify and address stream-related problems in their own terms. This is critical to securing citizen involvement.

VanDyke envisions riparian club groups of 10 to 12 families, including individuals who own property on opposite streambanks. She expects the clubs to discuss streambank restoration, sedimentation, streambank planting, fish habitat reconstruction, and the creation of buffer zones. She notes:

It is not uncommon for families living along a relatively short stretch of Bear Creek or one of its tributaries to have very different perspectives on how the stream should be utilized. Some may use the water for agricultural purposes, others may use it strictly recreationally, and for other families, the creek may be simply a visual feature of the landscape. Problems occur when one family's use impacts others' use downstream. If groups of families can begin to conceptualize the stream as an interrelated system and work cooperatively on goals for their sections, this will greatly enhance the watershed protection and restoration process.

At the present time, the plan is to encourage riparian clubs to form along the 17 miles of Bear Creek and its major tributaries — Armstrong Creek, Waddell Creek, and Stout Creek — based on the principle of shared riparian interests. Some clubs will be larger than others; some will focus on a single goal while others may have many goals; and some will look at short-term problems while others tackle more long-term concerns. Reflects VanDyke:

Just as block clubs in cities allow their members maximum flexibility and encouragement to set their own agendas, the Riparian clubs of the Bear Creek Watershed will be encouraged to develop at their own rate around their own interests. The clubs would be an excellent way of passing along the environmental ethic we are all working to create here.

[For more information, contact Patricia S. VanDyke, Project Manager, Bear Creek Watershed Project, 6878 Belding Rd., Rockford, MI 49341. Phone: (616) 874-6966. FAX: (616) 874-8940.]

First Great American Secchi Dip-in

Lake transparency data from a coordinated volunteer effort stretching across the upper Midwest in July 1994 has revealed widely varying conditions. Last summer eight hundred volunteer monitors in Ohio, Illinois, Indiana, Wisconsin, Michigan, and Minnesota gathered Secchi disk "snapshots" of lakes in the upper Midwest. The lowest transparency reported was 6 inches; the best, 34 feet. Both readings were taken in Minnesota.

The brainchild of Robert Carlson, a professor in the Department of Biological Sciences at Kent State University, and sponsored by the North American Lake Management Society, the Dip-In fulfilled an urgent need for water quality monitoring by trained volunteers. Such volunteers, Carlson explains, "can go to a lake a number of times per summer and take reliable measurements over the course of several years, something no state agency can afford to do."

Dip-In volunteers also provided information on depth, water color, activity on the lake on that day, and their perception of the lakes' suitability for those activities. Participants reported that algae, weeds, boat congestion, and silt were major problems along with trash and jet skis. Jay Lee, of Kent State, converted the data into maps that are available to state volunteer programs, qualified individuals, and agencies.

Carlson noted that a volunteer effort such as the Dip-In is beneficial because it adds valuable information to water quality databases and encourages environmental awareness. "Projects like this are a great way to get nonscientists involved in the protection of our nation's water resources," he said. "Informed and involved volunteers not only gain a better understanding about the lakes close to their homes, they may become concerned about the use, protection, and restoration of all lakes."

With 40 percent participation among the volunteers who were contacted for the Dip-In, Carlson hopes the project will expand from the original six states to the entire country, eventually spreading across the globe.

[For more information, contact Dr. Robert Carlson, Kent State University, Kent, Ohio 44242. Phone: (216) 672-3613.]

Notes on Agriculture

Small Horse Farm Sets Clean Water Example

If the terms best management practices, rotational grazing, manure management, and nutrient management bring to mind vast pastures and rolling fields, think again. Roland "Shep" Oliver, named the Northern Virginia Soil and Water Conservation District (NVSWCD) Cooperator of the Year, implements each of these practices on his 28-acre horse farm in Fairfax Station, a suburb of Washington, D.C.

Horse Owners Get the Facts on Pollution Control

U.S. EPA and Terrene Institute have cooperated on a fact sheet that outlines management techniques to prevent or reduce water pollution from stables and backyard livestock facilities. The five-page handout explains the types of pollution problems associated with the kinds of small, concentrated animal operations that are becoming more and more common in suburban areas. Owners can do much to alleviate water pollution by correctly managing paddocks and pastures as well as planning for animal waste storage, use, and application. These and other practical solutions for the stable owner are detailed in the fact sheet. Written by a horse owner for horse owners, the fact sheet also includes a landscape plan for a pollution-preventive backyard livestock facility and a design for a two-bin manure composter.

For copies of the fact sheet, "Pollution Control for Horse Stables and Backyard Livestock," contact your EPA regional nonpoint source coordinator or purchase for \$2.50, plus \$2.50 shipping/handling through the Terrene Institute, 1717 K St., NW, Suite 801, Washington, DC 20006 Phone: (202) 833-8317. Fax: (202) 296-4071.

Oliver has had a conservation plan for the 40-horse boarding establishment since 1987. According to District Conservationist Barry Harris, who works closely with Oliver, the farm has a rotational grazing system to protect individual fields from overgrazing and to keep horses out of pastures on rainy days when the turf is vulnerable to damage.

With so many horses on such limited acreage (the ideal ratio is one horse to 1.5 or 2 acres), Oliver relies on hay to provide the necessary forage and moves the horses to a "sacrifice area" when the pasture begins to show signs of stress. "This is the same type of management being used in dairy systems with 'loafing areas,'" said Robert Shoemaker of the Virginia Department of Conservation and Recreation.

It is challenging to manage horses in such tight quarters. Horses are notoriously "close grazers" and are hard on pastures even under ideal conditions, Shoemaker explained. "This is the kind of system where you have to be thinking a week to 10 days ahead."

Oliver has made a substantial investment in fencing, and he has installed a good watering system with several watering tanks. According to Harris, Oliver used cost-share funds for his watering system, grazing system, and pasture management practices.

Oliver strives to maintain good grass turf by no-till overseeding at least once a year. "We are basically trying to go from using grass as forage to managing it as turf to stop erosion," said Shoemaker, "It's kind of a demonstration project — we're watching to see how it works."

A good turf helps reduce soil and phosphorus runoff — the two main water quality concerns in an overgrazed pasture. Part of managing the pastures as turf means fertilizing the cool-season grasses in the fall to build up strong root systems that can withstand heavy horse traffic.

Shoemaker, a nutrient management specialist, worked with Oliver to develop nutrient and animal waste management plans that include using animal waste as fertilizer. The application of manure to pastures has eliminated the need for commercial fertilizer on Oliver's farm.

"In addition to nutrient and grazing management practices, the farm's streambanks are protected with grass or tree buffers, and critical areas like gullies are treated to reduce erosion," said District Conservationist Harris.

Recognizing Oliver for his achievements, the NVSWCD Board of Directors noted that he had demonstrated community leadership in the conservation of natural resources and excellence in the installation of conservation practices. From Oliver's point of view, he's simply watching out for his own: "I came here 21 years ago to raise a family and have a nice place in the country. . . . I've got to protect that land."

[For more information, contact the NVSWCD, 12055 Government Center Parkway, Suite 905, Fairfax, VA 22035-5512. Phone: (703) 324-1423.]

Not a Drop to Waste: Water on the Western Farm

By Anita K. Brown, Natural Resources Conservation Service, Davis, California

Water's role in every ecosystem is pivotal. In the arid west, the scarcity of water magnifies this role and mandates a carefully reasoned approach to its management and distribution. The reservoir, not the sky, supplies or denies the liquid most necessary for life. In western agriculture, irrigation, not rainfall, is the most common way of watering crops.

California provides more than half of all U.S. fruits and vegetables, produces some 60 crops grown nowhere else in the country, and ranks number one among the states in agricultural production. Much of this productivity is made possible by irrigation. Irrigation requires immense technical and political balancing. It also allows a certain amount of control that is usually impossible in the sometimes droughty, sometimes flooded conditions of the east and midwest.

Farmers, researchers, and professionals with the Natural Resources Conservation Service (formerly the SCS) and the Extension Service have combined decades of research and practical savvy to come up with a tool box of technical options known as Irrigation Water Management (IWM). These tools can be mixed and matched on a given farm to maximize water supply, minimize nonpoint source water pollution, and optimize crop yield.

A sampling of the IWM toolbox yields the following:

- *Selection of Irrigation Systems:* Water can be delivered through furrows, borders, sprinklers or micro (drip/spray) systems. Appropriate, well-designed, and properly operated systems can help the land user achieve efficient and uniform water distribution.
- *Irrigation Scheduling:* Controlling the timing and amount of water delivered to crops is vital. Monitoring techniques help landowners know how much water the crop is using and when it needs more.
- *Irrigation Water Recovery Systems:* Some irrigation methods allow water to run from fields into waterways. Recovery systems catch the water for possible reuse — conserving it and keeping farm nutrients and chemicals out of the waterways.

Land users need IWM to uniformly apply just the right amount of water at just the right time — which also controls erosion and salt concentration. Obviously, pesticide and nutrient applications must also be judiciously timed and integrated with irrigation, both for the optimal

yield and to protect water quality. In the west, irrigation management can influence groundwater nitrate levels as much as fertilizer management.

Not that IWM is a panacea for all things that ail desert cultivation. Salinization is a case in point. Water captured from beneath fields can be reused, but it becomes increasingly salty. Such water can be directed to crops with increasing salt tolerance and eventually to halophytes that can wick away the remaining water. The salt, however, remains behind. This problem predates biblical times and its solution remains a worthy quest for today's keenest intellects. Here, where no solution yet exists, IWM is buying us some time — and helping us optimize water use and improve western water quality.

Farm irrigation efficiency in California, according to a 1992 study by the University of California-Davis, increased more than 15 percent during the 1980s. The survey of 23 agricultural water suppliers shows increasing trends toward conserving systems and the increased flexibility and management needed to use every drop to its fullest potential.

Still, more progress is needed. For example, why doesn't every western grower use the best IWM technology available? Sometimes the grower perceives it as too expensive or inconvenient. Sometimes it's an educational and sociological issue, as adopting innovative technology often tends to be. Or the reasons may be deeper and more political, such as whether or not landowners will be rewarded or punished for saving water. Will they, for example, lose the rights to any water they save?

Fortunately, several innovative programs illustrate positive steps toward bringing better IWM to western farms:

- *Mobile Labs.* Some programs have put water management on wheels, helping growers identify problems and opportunities for improvements in the field. Some programs combine field trials and demonstrations with this mobile assistance.
- *Challenge Grants.* In California, the Resource Conservation Districts, the Bureau of Reclamation, the NRCS, and other federal and state agencies are forming partnerships to solve irrigation and related resource problems. Demonstration farms and associated information, education, and outreach allow communities to share IWM and other technology and information — both academic and locally tailored plans.

Irrigation and Nutrient Management Conference and Trade Fair

Where: Salinas, California
When: February 2, 1995
Purpose: To transfer practical knowledge to area growers about the issues and practices of conserving water and reducing nutrient leaching to the groundwater supply. Will focus on practical information and new technologies designed to cost-effectively manage and conserve water and nutrients. PCA/CCA credit approval pending.
Cost: \$40
Contact: University Extension, University of California, Davis, CA 95616-8727. Phone registration using Visa or MasterCard: (916) 957-8777.
Sponsors: Monterey County Water Resources Agency
University of California Cooperative Extension Service
University Extension, UC Davis
Irrigation Training and Research Center, California Polytechnic State University, San Luis Obispo
California Energy Commission
Fertilizer Research and Education Program, CDFA

- *Cooperative Hydrologic Unit Area Projects.* In Patterson, California, a Natural Resources Conservation Service, Resource Conservation District, and Cooperative Extension Service project begun in 1990 has kept 250,000 tons of sediment and associated DDT residues out of the San Joaquin River. Landowners are encouraged to switch to irrigation methods that slow the flow of water, lessening the amount of sediment shaken loose by fast-travelling streams. Water is also applied and timed for best use by the crop and reused through tailwater return systems. Sediment off the fields is allowed to settle in ponds before the water is returned to the river or pumped on to the next field.

The final chapter has not been written on any of these projects, but IWM is a multifaceted, cultural change that can be adjusted to fit the crop, soil, climate, water rights, pocketbook, and other needs of the customer.

[For more information, contact Anita K. Brown, Director of Public Affairs, NRCS-California, 2121-C 2nd St., Davis, CA 95616. Phone: (916)757-8241. FAX: (916) 757-8382.]

Survey Shows Reduction in Nitrogen Fertilizer Rates Follows Pre-Sidedress Nitrogen Soil Testing

Extension staff and researchers in many states have discovered that farmers apparently apply less nitrogen fertilizer to corn where the Pre-Sidedress Nitrate Test (PSNT) is used, according to a 1993 survey report. The PSNT helps growers identify fields that need supplemental nitrogen during the growing season. Nitrogen soil testing improves nitrogen-use efficiency and reduces losses of nitrogen to the environment by helping farmers avoid excess applications.

The report, *Soil Nitrate Tests for Corn—1993 State Surveys*, said that although the information from many states is incomplete, Iowa's detailed study of 100 farms showed that using the PSNT resulted in a nitrogen application reduction of 47 pounds (36 percent) per acre, with no reductions in yield. Other states estimated nitrogen reductions from 10 to 33 percent.

Authors Mitchell D. Woodward of the USDA Extension Service, V. Allan Bandel (retired) of the University of Maryland Extension, and Bert R. Bock of the Tennessee Valley Authority, noted that the PSNT is used mostly for corn in the Northeast and in some Midwest states. The PSNT, or "quick N test," was pioneered in 1985, but most states did not begin a PSNT program involving crop producers until the 1988-1990 growing seasons. However, acceptance of the test is growing; in 1992, 13 states reported using the PSNT, compared to only six in 1990.

The report pointed out that growers are concerned about the turn-around time when the soil analysis is done in a laboratory. In Connecticut, where 800 soil samples were tested by the state Extension in 1992, the test is free, and farmers receive the results within two days. "Ideally," the authors said, "if a one to two day turn-around is not possible, crop producers must learn to run this test on-site themselves if the results are to be of practical value."

Future of the PSNT

PSNT and indeed all soil nitrate tests have limitations. Because nitrogen availability in the soil varies according to changing temperature, moisture, pH, and aeration, it is more difficult to evaluate nitrogen than other nutrients. The current limitations of the PSNT are its restriction to corn, its use only with sidedress fertilization, and the necessity for quick analysis. In addition, the PSNT is very good at identifying nitrogen-sufficient sites, but more research is needed to improve its accuracy for predicting insufficient nitrogen availability for crop production.

According to the authors:

The jury is still out regarding the ultimate role of the PSNT and just how widespread and effective its ultimate function will be. Its success will largely depend upon how favorably and aggressively it is promoted to growers by government agencies, industry, and others. Experience suggests that growers will be more inclined to accept it readily if they are confident that it will benefit and not harm them financially.

[For additional information, contact Mitchell D. Woodward, USDA-ES, Agriculture Programs, Rm. 3340 South Bldg., Washington, D.C. 20250-0913. Phone: (202) 720-4341. FAX: (202) 720-4730.]

Texas Strategy to Control Feedlot NPS Pollution

A practical strategy for reducing pollution from concentrated animal feeding operations (CAFOs) will, according to the Texas Institute for Applied Environmental Research, rely on both voluntary pollution prevention measures and water quality regulation enforcement. The strategy, described as a "planned intervention, microwatershed" approach, has already been adopted, in part, by the Texas legislature.

The Institute (TIAER) developed the strategy explained in its publication *Livestock and the Environment: Watershed Solutions* during a four-year water quality study of the Upper North Bosque River watershed. The 230,000-acre east Texas watershed supports nearly 100 dairy operations and is divided into a number of microwatersheds.

Microwatersheds, says TIAER, are small enough "to allow all stakeholders to meet face to face to discuss local water quality issues." Participation at the microlevel allows a "bottom-up" involvement in pollution control efforts and gives the agricultural community an alternative to

traditional regulatory strategies. The alternative is needed because CAFOs are regulated as point sources of animal waste, but they often have nonpoint source impacts when the manure is applied to fields. According to TIAER, nonpoint source aspects of dairy waste management are not usually amenable to command-and-control regulation, but they can be controlled through planned intervention and a watershed approach to environmental quality.

Under the TIAER strategy, a designated state agricultural agency charged with directing all agricultural nonpoint source pollution prevention identifies watersheds that are significantly impaired. Then, local conservation districts help identify microwatersheds within the larger watersheds and the types of agricultural operations that need site-specific water quality management plans.

Meeting as a consortium in each subwatershed, stakeholders identify pollution problems and solutions, and establish water quality monitoring programs. With assistance, they can assess their own operations and develop and implement plans to abate pollution.

Peer pressure within the consortium helps induce compliance. Enforcement is reserved for producers who refuse to cooperate with the agricultural lead agency and conservation district to develop and implement water quality management plans. Planned intervention became part of Texas law in 1993 and applies to all agricultural and silvicultural operations in targeted areas of the state.

Integral to the program is the development of numeric nonpoint source water quality targets, which would supply agricultural operators with objective goals and valuable feedback about their pollution control efforts.

TIAER researchers from the environmental sciences, economics, and policy analysis programs worked together to develop the strategy. They performed extensive chemical analysis in the Upper North Bosque River drainage area and conducted biological sampling of the watershed's mostly intermittent streams. *Livestock and the Environment: Watershed Solutions* details the study's results and scientific and economic underpinnings.

Work in the Upper North Bosque River watershed continues as a comprehensive pilot study *to determine technologies, management tools, policies, and institutional settings that can reduce the negative impacts of livestock production on the environment, and at the same time, result in a national livestock industry that is economically available and competitive in increasingly open international markets.*

[For more information or a copy of *Livestock and the Environment: Watershed Solutions*, contact Larry Frarey, Texas Institute for Applied Environmental Research, Tarleton State University, Box T-258, Tarleton Station, Stephenville, TX 76402. (817) 968-9567. FAX: (817) 968-9568.]

Future Farmers Promote Filter Strips in Operation Green Stripe

University research has demonstrated the effectiveness of vegetative filter strips in reducing runoff of sediment, organic matter, nutrients, and pesticides. Filter strip effectiveness depends on type and frequency of tillage above the strip, time between tillage and rainfall, rainfall, rain intensity and duration, and steepness and length of slope above the filter strip. Research is currently underway at several midwestern universities to study the impact of vegetative filter strips on pesticide movement.

Students and farmers across 16 states are learning together to protect soil and water resources. The students, members of Future Farmers of America (FFA), enroll farmers in a program to plant filter strips or "green stripes" along lakes, streams, rivers, and around sinkholes. In turn, the Monsanto Corporation, which conceived the program, gives the FFA chapter a \$100 educational grant for each farmer it enrolls.

Monsanto has also established a "Best Chapter" award that will be given to the FFA chapter in each state that creatively uses the program to include other environmental approaches such as wildlife protection and habitat restoration projects.

FFA chapters receive press release packages that they can use to publicize their program locally, while field days conducted in the fall generate statewide publicity for the program. Field day participants include representatives from agribusiness, education, Extension, NRCS, state departments of agriculture and natural resources, and the media. The field days model conservation activities in agriculture and show how green stripes reduce soil erosion and nonpoint source runoff.

"The program works," says Doug Rushing, Monsanto environmental affairs manager, "because farmers really do care about water quality, wildlife, and the environment." The program recognizes their stewardship and educates future farmers about surface and groundwater issues and conservation practices.

Monsanto, the Natural Resources Conservation Service (NRCS), and state agricultural agencies work cooperatively to identify areas in each state that have water quality problems and to supply information on the best plants to reduce field runoff in these areas. Cooperating seed distributors (e.g., Farmland Coops in Kansas and Nebraska) provide the seed and technical expertise to the farmers.

Operation Green Stripe was established in 1992. Seven states enrolled 400 farmers in 1993. In 1994, over 200 FFA chapters participated in the program and over 1,000 farmers are expected to establish Green Stripes in the Great Plains and the midwest — in Nebraska, Kansas, Missouri, Iowa, Illinois, Minnesota, and Indiana. The program will also extend into Ohio, Pennsylvania, New York, Maryland, Kentucky, North Carolina, and Texas.

[For more information, contact Doug Rushing, Monsanto Company, 4200 Corporate Drive, #114, West Des Moines, IA 50266. Phone: (515) 225-8382. FAX: (515) 225-0840.]

- Operation Green Stripe guidelines suggest that filter strips be a minimum of 16.5 feet wide and run the length of the field.
- They may also be established around the point of entry for field runoff into a stream as allowed in current triazine BMPs.
- The Green Stripes must be maintained for at least three years. Each FFA chapter may enroll as many as five farmers.

Coastal Nonpoint Pollution News

Threshold Review Process A Valuable Two-Way Exchange

A regular feature of *NPS News-Notes*, this column by EPA and NOAA staffers highlights the development of state coastal NPS programs as provided for in the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). Section 6217, "Protecting Coastal Waters," requires states and territories with federally approved coastal zone management programs to develop and implement Coastal Nonpoint Pollution Control Programs. Articles contributed by states are also welcome.

Teams from the National Oceanic and Atmospheric Administration (NOAA) and EPA have conducted 18 threshold reviews, and scheduled four more to take place in the next several months. By March, the teams will have conducted threshold reviews for all states and territories requesting them.

The threshold review evaluates each state or territory's approach to specific elements of its program prior to final program submittal. It provides an opportunity for each one to make mid-course corrections to its coastal nonpoint program while it is in development, that is, before July 1995. Twenty-nine states and territories are currently required to develop coastal nonpoint programs.

The states and territories, as well as NOAA and EPA, have found the open discussions valuable. States and territories have had face-to-face opportunities to refine their approaches and priorities before making substantial investments in program development. NOAA and EPA staff take advantage of the process to become familiar with specific state and territory programs and to gain a broader understanding of common issues. In return, these agencies can disseminate promising approaches from one state or territory to another.

Workshop Held

A recent NOAA and EPA-sponsored workshop was an additional way to share the success, innovations, and common challenges that have developed in individual coastal nonpoint programs. The national workshop in September 1994 was attended by representatives from at least 30 coastal states and territories. Most participants responded positively to the workshop, agreeing that the gathering of states and territories allowed a broad exchange of ideas. The

workshop also gave states and territories a chance to learn about national directions and perspectives.

The central purpose of the state CZMA programs that must be approved by EPA and NOAA is to enhance state and local efforts to manage activities that degrade coastal waters and coastal habitats. This task is accomplished initially through a "technology-based" approach; states must implement management measures that control sources of nonpoint pollution from agriculture, silviculture, urban development, marinas, and hydromodification. The program includes additional components to assure that any residual water quality problems are also addressed.

[For more information, contact Amy Sosin, NPS Control Branch (4503F), U.S. EPA, 401 M St., SW, Washington, DC 20460. Phone: (202) 260-7058; or Marcella Jansen, NOAA, 1305 East-West Highway, 11th Floor, Silver Spring, MD 20910. Phone: (301) 713-3098, ext. 143. Or you may leave a message on the NPS BBS for John Kosco of EPA's NPS Control Branch.]

Notes From the States Tribes and Localities, Where the Action Is

Rare Ozark Cavefish Sparks Missouri Pollution Prevention Effort

A small, slow-moving, eyeless fish found only in the caves of the Springfield Plateau is spurring a positive approach toward pollution prevention in southwest Missouri.

According to Brian Canaday of the Missouri Department of Conservation, area landowners have responded positively to a voluntary approach, especially when they realize that high quality groundwater is as essential to them as to the cavefish.

The Ozark Cavefish is listed federally as threatened, on the state level as endangered. Only 25 sites in the world (mostly in Missouri, with a few in Arkansas and Oklahoma) are known to shelter the species. Its survival depends on the quality of the groundwater that feeds its subterranean pools. "The porous karst landscape is like a sponge, allowing surface water to percolate quickly through the limestone without the filtering effect found in other areas," explained Canaday. Waste from poultry and dairy operations in groundwater recharge areas is the biggest potential threat. A sudden failure of a farm's waste lagoon could be disastrous.

"The best way to halt further decline is to prevent problems before they occur," says Canaday, who also notes that because the state listing carries no regulatory authority, his program relies on landowner awareness and cooperation to protect the remaining cavefish.

The cornerstone of the recovery effort for the Ozark cavefish is a plan written by the U.S. Fish and Wildlife Service (FWS). The plan lists a number of factors that have contributed to the decline of this species, including habitat destruction, specimen collection, and declining water quality. Water quality is affected by erosion from row cropping, road construction, and clear cutting. Leaking septic tanks also add to pollution.

Canaday, known to some as "the cavefish man," has been working with landowners for about 18 months. "By visiting landowners in these recharge areas, we are able to work with those who are going to have the most direct influence on cavefish habitat. Usually, only small changes — capping abandoned wells, revegetating the cave entrance, installing cave gates to exclude humans, proper septic maintenance — are needed to reduce or eliminate current or potential problems," said the fisheries management specialist.

Emphasis on "Self-Benefits"

The landowner contact program has three components: education, site visits, and management options. Educational activities have included several landowner workshops, at which conservationists explain the background and biology of the Ozark cavefish, factors that influence its populations, and state recovery activities. Important information is also provided on how landowners themselves can help. Past workshops have motivated several landowners to request on-site inspections of their property to look for existing and potential threats to groundwater.

In his work with property owners, Canaday emphasizes "self-benefits," such as protecting drinking water; and he provides sources of help for the problems he uncovers. Modeled after the successful Missouri Streams Program, the Cavefish Public Outreach and Habitat Management Project uses a holistic approach that pulls together various federal, state, and local resources to provide technical, educational, and financial help tailored to individual situations. For example, EPA funding has been provided for land use planning, revegetation, livestock exclusion, and the sealing of abandoned wells.

EPA recently approved funding for an additional two years of public education and habitat management. On-site evaluations (including pesticide applications) and projects to avoid or control potential impacts to groundwater and cavefish habitat will be emphasized.

Project accomplishments to date include recharge area delineation, surveys of cave flora and fauna, public education materials, media recognition, and local presentations. According to Canaday,

This is an excellent start, but more is needed. Habitat projects such as reestablishing trees and vegetation in riparian areas and around cave openings and sinkholes will not only help groundwater quality by reducing the amount of runoff to these sensitive areas, but will also provide habitat for other species.

Public awareness combined with whole habitat management . . . is working for endangered species and the people of southwest Missouri.

[For more information, contact Brian Canaday, Fisheries Management Specialist, Missouri Department of Conservation, 2630 North Mayfair, Springfield, MO 65803. Phone: (417) 895-6880. FAX: (417) 895-6910.]

Virginia Tax Credit Helps Reduce Nutrients to Chesapeake Bay

Virginia agricultural producers who purchase manure application equipment may reduce their state income tax liability by \$3,750 or 25 percent of the equipment's price, whichever is less. The Virginia General Assembly recently established the tax credit program to encourage proper use and application of manure as a nutrient management tool. Says Jack Frye of the Virginia Department of Conservation and Recreation (DCR): "Nutrient management is an effective tool to reach the goal of 40 percent reduction in nutrients draining into the Chesapeake Bay."

To qualify for the state tax credit, Virginia agricultural producers must

- engage in agricultural production for market,
- develop a nutrient management plan approved by their local conservation district, and
- purchase manure application equipment with special features that help prevent pollution.

Nutrient management specialists at DCR regional offices help farmers determine eligibility and write nutrient management plans. DCR encourages manure testing and urges producers to save money by applying manure accurately and uniformly to reduce or even eliminate the need for additional commercial fertilizers.

According to Frye, approximately 200 Virginia farmers have taken advantage of the tax credit program. The program has benefitted more than 50,000 acres of farmland in the state and decreased commercial fertilizer applications by an average of 24.4 pounds of nitrogen and 23.2 pounds of phosphate per acre.

[For more information, contact Jack Frye, Director, Division of Soil & Water Conservation, Virginia Department of Conservation and Recreation, 203 Governor St., Richmond, VA 23219. Phone: (804) 786-2064. FAX (804) 786-1798.]

Lummi Nation Celebrates Return of Salmon But Return Rate of Wild Chinook Is Low

Last year, the Lummi Tribe of northwest Washington celebrated their ancient First Salmon Ceremony in September.

Traditionally held in the spring, the ritual feast marks the return of the Chinook salmon to their natal waters. Laid on a bed of cedar boughs and carried in a procession amid prayers and songs, the first salmon caught in the season is cut using ceremonial knives and cooked on a stick over an open fire of alder wood. The tribe's elders feast on the salmon to establish "oneness between the human people and the salmon people," according to Lummi Pauline Hillaire. Younger people carry the remaining bones back to the sea, where, legend says, they return to life.

From ancient times, the Lummi philosophy has taught that both salmon and people are one with the environment. But today, so few native wild Chinook return up the Nooksack River in the springtime that the fall run of hatchery-reared salmon must now provide the Lummi's traditional feast. According to biologist Jon Anderson of the state fish and wildlife department, the return rate of the spring Chinook stocks is critically low. Fewer than 520 wild spring Chinook were expected to spawn in the north and south forks of the Nooksack River in the summer of 1994. The hatchery Chinook, however, were expected to exceed 46,000 in their fall run.

Poor Habitat Interferes with Reproduction

State biologists say that impacts on the wild spring Chinook from competing hatchery-bred fish and from fishing are uncertain, but they and Lummi Natural Resources Director Merle Jefferson agree that the principle problem in both forks is habitat degradation.

The entire Nooksack basin has been heavily logged and has experienced massive slope failures. Road construction, clear-cutting, and agriculture cause sedimentation of spawning areas, preventing eggs deposited there from developing. The sediment also fills in natural holding pools where the adult fish wait prior to spawning.

When the trees are removed, the loss of shade along the banks of the tributaries increases the temperature of the water—sometimes to as high as 70°F, the lethal limit for salmon; and, with fewer of the naturally cooler pools, the fish have no place to wait out hot spells.

The lack of habitat compounds yet another problem for salmon in the river. In the South Fork, a popular rafting area, 500 or more people a day float down the river on inflated inner tubes. Attracted to the magnificent fish, many floaters attempt to touch them. With few deep pools, snags, and stumps to serve as hiding places, fish may die simply from harassment, according to Sanford. In an effort to protect the fish, signs now warn rafters of the problem, and some areas of the river have been closed to the public.

Another problem is a diversion dam on the Middle Fork, which, coupled with natural barriers, prevents salmon from reaching important upstream habitat. In the lower river, the connection to the Lummi River has been blocked, eliminating outmigrating smolts' routes to the rich estuarine habitat of Lummi Bay.

Long-term Restoration Plan Needed

These modern disturbances are placing enormous burdens on the native Chinook stocks. Spring Chinook numbered 3,000 to 5,000 in the early 1950s, according to fish and wildlife resource manager Bruce Sanford. Fishing was restricted by the early 1970s and now, nearly all fishing for spring Chinook is prohibited in the river and at the outlets in the bay.

Hillaire herself recalled that when she fished as a girl in 1944, 50-pound, and sometimes even 70-pound, fish were commonly caught. Today's catches, she said, average only about 14 pounds, and the tribe must go farther out into Puget Sound to catch them.

The fish's status has been declared critical by the state and the Western Washington Treaty Indian Tribes, but, although the federal government has been petitioned for endangered status, neither North Fork nor South Fork stocks have yet been listed.

United by a common concern for the salmon, the Washington Department of Fish and Wildlife, the Lummi Tribe, and the Nooksack Tribe, who also have fishing rights, formed a technical committee in 1980 to rebuild the stocks in both the North and South forks.

Lummi Nation
Celebrates
Return of Salmon
But Return Rate
of Wild Chinook
Is Low
(continued)

The current goal is to build a naturally spawning population at a level that can sustain some harvest. Strict limits on fishing have been imposed, and, because so much breeding habitat has been destroyed, many adult fish are taken into the hatcheries to spawn.

Tribes and the state have run hatchery programs since the 1930s and 1940s. While fall Chinook appear to be more easily reared in hatcheries, the success of hatchery supplementation of spring Chinook stocks is elusive. The hatcheries try to maintain the genetic purity of the different salmon stocks.

The 1992 Washington State Salmon and Steelhead Stock Inventory, reported

There is no question that the North Fork and South Fork Nooksack Chinook stocks are in a critical condition. The egg bank program can sustain the stocks for the short term, but the habitat requirements must be fully understood and steps taken to recreate the habitat to which the fish were adapted before we can expect the resource to support even minimal fisheries.

Ken Bruya, a state wild-stock salmon biologist, said that \$1.2 million has been allocated for habitat recovery in the Nooksack basin over two years. According to Sanford, such activities include building an acclimation pond on the North Fork, placing logs in the South Fork, and improving passage tributaries. A comprehensive state native Chinook recovery plan is scheduled for completion by June 1995.

An on-going Environmental Protection Agency grant has provided money for improvement of water quality and compilation of a Nooksack atlas which correlates spawning with habitat problems.

Sanford observed that part of the problem is the tangle of conflicting interests, even among agencies. He would like to see all federal, state, and tribal agencies and private land owners with an interest in water, land, fish, and trees come together to work on fish habitat issues as well as the other concerns of the area.

The Washington Department of Ecology recognized this need to address Nooksack basin problems and established the Nooksack Initiative in May 1994. The Initiative, based in a field office in nearby Bellingham, is taking a comprehensive approach to involving all stakeholders in the development of water quality and habitat recovery solutions.

For now, the timeframe for habitat recovery is estimated to be between 50 and 200 years. Perhaps the first step toward that recovery will be what Lummi tribal member Pauline Hillaire calls for—a renewed spirit of respect for the fish among all the region's people.

[For more information, contact Merle Jefferson, Natural Resources Director, Lummi Indian Business Council, 2616 Kwina Rd., Bellingham, WA 98226-9298. Or contact Jon Anderson, Washington Department of Fish and Wildlife, Puget Sound Salmon Harvest Management Unit, 600 Capitol Way N. (MS 43150), Olympia, WA 98504-3150. Phone: (206) 902-2711; or Carol Smith, Chinook Stock Assessment Biologist, Washington Department of Fish and Wildlife, same address. FAX: (206) 902-2980.]

Road Salt — Vermont's Highways Get Less of a Good Thing

"Use precisely what you need and no more," is Vermont Maintenance Engineer Milan Lawson's philosophy in managing his state's snow-covered roads this winter. Winter road runoff may result in damaging chloride concentrations in groundwater and surface water.

Snowplow drivers have traditionally determined the amount of salt to use on icy roads based largely on air temperature and their own experience. Practically all road departments use predetermined salt application rates based on air temperatures and storm conditions.

Last year, Lawson devised a "smart salting" program that calculates salt application rates using infrared sensors attached to snowplows to measure pavement temperature. The \$2,000 devices have revealed that pavement temperature is rarely the same as air temperature. It is usually warmer, often dramatically so in the winter. (The surfaces of bridges, of course, are often colder than that of surrounding pavement.)

The amount of salt needed increases sharply with a drop in pavement temperature: at 25°, three times more salt is needed than at 30°. When the pavement is warm enough for salt to be effective, Lawson's drivers use the exact amount necessary; when the pavement is so cold that salt would be inefficient, his crews apply abrasives, like sand.

SALT: What Towns Can Do To Protect Water Resources

Public water supply reservoirs, groundwater aquifers, and sensitive waterbodies near roadways or salt storage piles are susceptible to the effects of sodium and chloride in runoff. These practical suggestions will help reduce excessive salt runoff:

STORAGE:

- Salt storage piles should be completely covered.
- Salt should be stored and handled on impervious surfaces.
- Runoff should be contained in an appropriate area.
- Spills should be cleaned up after loading operations. The material may be directed to a sandpile or returned to salt piles.

APPLICATION:

- Trucks should be equipped with ground-speed sensors that automatically control the spread rate of the material.

- Drivers and handlers of road salt should attend training programs to improve efficiency and reduce losses.
- Drivers should avoid plowing snow from treated surfaces into piles on or near frozen ponds, lakes, or wetlands.

ADDITIONAL SUGGESTIONS:

- Identify ecosystems such as wetlands that may be sensitive to salt.
- Use calcium chloride and calcium magnesium acetate, which are more costly than sodium chloride but may be less environmentally harmful to sensitive ecosystems.
- Apply sand to help traction and reduce salt. However, excessive sanding may pose sedimentation problems.
- Apply deicing materials in the minimum amounts needed.

"Applying salt based on air temperature that is taken at about eye level is inefficient because the chemical works where the rubber meets the road," Lawson points out. He estimates that the old method uses 20 to 30 percent more salt than needed. Last year, the area in central Vermont that is piloting the project used 15 percent less salt than the year before, saving about \$77,000 and paying for the four sensors purchased almost 10 times over.

Although the main goal of the program is to increase efficiency, part of the incentive was concern for the environment. "One of our most precious resources is our drinking water. Anything I can do to prevent pollution is a step forward," said Lawson.

"We've always solved problems by throwing too much of a good thing at them," commented Lawson. "Smart salting," like many other management practices that use *less* of a good thing, has multiple benefits; it reduces pollutants, boosts efficiency, and saves money.

[For more information, contact Milan Lawson, Maintenance Engineer, Vermont Agency of Transportation, 133 State St., Montpelier VT 05633. Phone: (802) 828-2663. FAX: (802) 828-2848.]

Notes on Environmental Education

NPS Captures Imagination of Young Scientists

Students across the country chose nonpoint source pollution subjects for their science fair projects in 1994. Some local and regional winners went on to compete with more than 900 junior and senior high school students from 20 countries gathered at the International Science and Engineering Fair in Birmingham, Alabama, May 6-14.

Among the finalists in the international competition:

- ★ Sarah Morgan, 14, of Marianna, Florida, received the American Water Works Association's first place award for her study of grassland aeration as a key to reducing nitrate levels in runoff water.
- ★ Catherine Stott, 17, of Mankato, Minnesota, won a fourth place award from Phillips Petroleum Company for her project, "Runoff levels of nitrate, ammonia and nitrite from simulated fields of *avena sativa*."
- ★ Erika Church, of Hilton Head Island, South Carolina, tested the effects of engine oil, fertilizer, liquid soap, insecticide, and a larvacide used for mosquito control on regeneration of the cheliped claw of male fiddler crabs.

- ★ Karl Anderson, 18, of Albuquerque, New Mexico, won awards from six organizations for his computer simulation of erosion, which can be calibrated to predict overall deposition volume.
- ★ Princesa Victoria Van Buren, 18, of St. Cloud, Minnesota, treated taconite tailing with fertilizer, composted yard waste, and sewage sludge, singly and in combination, for revegetation and stabilization in mine reclamation.

Nonpoint source projects also garnered high ratings at state and regional fairs:

- ★ Phil Leitnaker of Fairfield Union High School in Fairfield County, Ohio, won an award at the Ohio state competition for a four-year comparison of phosphorus runoff from fields treated and not treated with municipal sewage sludge.
- ★ Erin Wick, a sophomore at Riverside High School, won in Ohio for a study finding that cornstalks in fields reduce runoff rates compared to fields left bare.
- ★ Megan Meese of Lexington High School, Lexington, South Carolina, a South Carolina 1994 Champion of the Environment (See *News-Notes* #35, March/April 1994), won second place in a regional fair for her work with absorption of oil on water using wood chips.

[For more information about the International Science and Engineering Fair, contact Science Service, Inc., 1719 N Street, NW, Washington, DC 20036. Phone: (202) 785-2255.

For information about the Ohio State Science Fair, contact Jeanne Russell, Ohio Department of Natural Resources, 1939 Fountain Square Court, Building E-2, Columbus, OH 43224. Phone: (614) 265-6682.

For information about South Carolina's environmental science awards, contact Phil Hayes, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, SC 29201. Phone: (803) 734-5078.]

EPA Region 1 Recognizes Wetland Stewardship

EPA Region 1 (New England) offers a certificate encouraging schools to translate classroom learning into community action. Classes in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont qualify for certificates by conducting a stewardship-oriented activity to help protect or improve the quality of local wetlands.

In awarding the certificates, EPA Region 1 recognizes the students' interest in the environment and acknowledges that their efforts are effective and appreciated by environmental protection professionals.

A class can qualify for a certificate by performing one or more of the following activities:

- conduct a wetlands education campaign in the school or community, for example, produce a field guide;
- construct "wetlands crossing" signs along roadways or bridges;
- identify vernal pools (small seasonal spring pools);
- clean up a wetland;
- patrol the wetland on a routine basis to look for evidence of dumping and other illegal activities; or
- perform any other activity that protects or improves the quality of a nearby wetland.

Teachers' ideas and experiences will be compiled for a wetlands educator newsletter to be distributed to those participating in the Adopt-A-Wetland Program.

Region 1 has also produced a wetlands educational program, "A World in Our Backyard," which was distributed to Region 1 teachers in late spring 1994 (see *News-Notes* #33, November-December 1993). The program contains classroom instruction and background activities related to carrying out a wetlands field project.

[For more information, contact Stafford Madison, EPA Region 1, Wetland Protection Section, JFK Federal Building, Boston, MA 02203. Phone: (617) 565-4868.]

The Comprehensive Water Education Book — A Review

Based on the assumption that children learn best by doing and convinced that water literacy — understanding people to water relationships — will help solve present and future water problems, *The Comprehensive Water Education Book* is a water science curriculum for grades K through 6.

The book's conceptual framework and presentation are amazingly practical: a series of graded lesson plans that present (1) the chemical and physical properties of water and the hydrologic cycle, (2) the dependence of all living things on water, and finally, (3) the importance and variety of water uses to human beings and the factors that govern the wise use of water.

The lessons are for primary or intermediate grades and each contains a purpose, suggested vocabulary, list of materials, and description of activities for concept development. Background information for the teacher stands at the head of each series of lessons, and the lessons need not be followed in the order of their presentation. The background materials are simply presented but not simplistic: the teacher does not have to be a scientist to profit from these insights.

An additional feature that must be highly regarded is the inclusion of boxed reminders introduced by the "Castor says" icon (*Castor canadensis* being the species name for beaver). The boxes contain helpful asides to the teacher, some of which, like everything in this book, can be shared with students.

The first four chapters contain a total of 63 lessons that move from the descriptive properties of water to the connections between water quality and flow, the food chain and energy, habitat, and biota in the watershed. A watershed protection approach and ecology-based conservation planning will be more than buzz words to the generation brought up on curricula of this nature.

In the introduction to chapter 5, Castor says, "Sometimes it is valuable to do things just because they are fun." The icon is followed by more than 30 water-related projects that bring science to life and relate it to art and physical education. Parents will be as excited about this section as classroom teachers are.

Chapter 6 completes the book with notes on what equipment is needed for science projects. Some equipment can be homemade; however, the authors recommend manufactured chemistry sets. That their list of suppliers includes companies from diverse geographic areas is one more clue that this book is national in scope and comprehensive. It is well named *The Comprehensive Water Education Book*.

[*The Comprehensive Water Education Book* by the International Office of Water Education, Utah Water Research Laboratory, Utah State University, Logan, Utah. 1994. 335 pages paperback, \$8.75 including shipping.]

NPS Electronic Bulletin Board News

This portion of *News-Notes* is prepared for the benefit of the ever-increasing number of *News-Notes* readers who are regular users of U.S. EPA's *NPS BBS*.

Nonpoint Source Electronic Bulletin Board System. EPA's *NPS BBS*, through the user's personal computer, provides timely, relevant NPS information; a nationwide forum for open discussion; and the ability to exchange computer text and program files. Specific Issue Groups (SIGs or mini-bulletin boards) are dedicated to specific topics. Currently, there are eight SIGs on the *NPS BBS*: Watershed Restoration, Agriculture, Fish Consumption Risk Management, TMDLs, Waterbody System Support, NPS Research, Volunteer Monitoring, and Coastal NPS Control. All articles from all issues of *News-Notes* are stored on the *NPS BBS* and may be retrieved on your personal computer. A searchable *News-Notes* database helps you find the information you need.

To access the *NPS BBS*, you will need • A PC or terminal • Telecommunications software (such as Crosstalk or ProComm) • A modem (1200, 2400 or 9600 baud) • A phone line. The *NPS BBS* phone number is (301) 589-0205. Parameters are N-8-1.

The *NPS BBS* may also be accessed from the Internet by typing TELNET FEDWORLD.GOV. Once on FedWorld, turn ANSI graphics off and go through the Gateway to NPS-BBS, or command D 79.

Watershed Registry Expands

EPA's Nonpoint Source Bulletin Board System now contains information on more than 300 watershed projects from around the nation. The number of entries in the Watershed Registry's on-line searchable database almost doubled in November 1994. The Watershed Registry is a valuable networking tool to share information with other professionals working on watershed projects.

Users of the database can learn about innovative technologies integrating nonstructural or land use measures into watershed management, major successes of other project teams, and more. Each record in the Watershed Registry Database pertains to a specific person's activities on a particular watershed project. Keywords enable users to search by management or restoration activities, expertise, watershed size and location, type of waterbody, land use, water quality or habitat problems, project partners, monitoring type, data storage and analysis, and volunteer activities.

Following a keyword search, users can generate reports that display participants' names, addresses, phone numbers, and project activities and expertise. Examine the database and explore the possibilities.

The searchable database and an on-line, interactive form for registering your own watershed project activities are in Doors 1 and 2 of the Watershed Restoration Network, Specific Issue Group (SIG) #5 on the NPS BBS.

Reviews and Announcements

A Handbook for Citizens Saving Rivers

EDITOR'S NOTE: Thanks to Owen D. Owens for reviewing David Bolling's *How To Save A River*. Owens is a founding member of the Valley Forge Chapter of Trout Unlimited and the author of *Living Waters: How to Save Your Local Stream* (see NPS News-Notes #36, May-June 1994).

What can be done to save rivers threatened by destructive human plans and practices? I wish I had had a handbook like *How To Save A River* when I began to get active as a citizen to save endangered local streams.

Drawing on his experience as executive director of River Network, the largest river conservation organization in the west, David Bolling has now undertaken the task of sharing what he and others have learned. Broadening his experience through interviews with river conservationists throughout the country, Bolling gives extensive information on techniques, river-saving tools, and other river issues.

A brief introduction about saving rivers from destruction supplies reasons for finding a better way to take care of our rivers. The poetic phrase "rivers are the arteries of the earth" is biological truth, says Bolling. Rivers sustain the ecosystems that support the diversity of planetary life. Those who take on the job of saving a local river or stream have an opportunity to make a major difference.

Part 1 of the book identifies the steps to be taken. Getting organized requires the kind of commitment that emerges from an act of passion. "You make the choice because the river has touched your life in an intimate and irreversible way, because you are unwilling to accept its loss," Bolling writes. This commitment is very much like marriage. It takes a deep and long-term effort to be a successful river-saver.

The next steps are finding partners, establishing an organization with clear mission goals, and translating that mission into a name, image, and organizational identity. Bolling outlines various methods of raising money, choosing a tax status, preparing a budget, and hiring a staff.

A critical beginning phase is surveying the river and developing a solid scientific description. A particularly helpful part is the section on finding long-term solutions. It is not enough to save a river for the short term, leaving it vulnerable for future attack. We need, instead, to identify some way of protecting it for posterity. The chapter covers public trust doctrine, flood water management, water efficiency and conservation, economic analysis, citizens' environmental law

suits, greenways or riparian corridors, comprehensive river management plans, land acquisition and conservation easements, and river restoration.

Another chapter identifies ways to build public support. Drawing on efforts tested in many parts of the country, Bolling explains how to move from planning and organizing to getting the job done. Particularly valuable are the sections on negotiating from a position of strength and being prepared to compromise.

Part 2 of the book covers tools. The author lists related laws and programs, along with suggestions about their use. Finally, in Part 3, Bolling ruminates on a broader question: why keep rivers free-flowing? Eleven very good reasons are identified. The organizer will probably turn to this section frequently in preparing news releases, articles, and other communications.

Even more important than citizen action against dams, diversions, and pollution, Bolling concludes, is the need for all of us to establish relationships with our rivers. We need to get out, get wet, and feel what is going on. Says Bolling, "We are not inclined to destroy that which we know and love. The ultimate protection of rivers will come when enough people have attained that knowledge and developed that love."

We do indeed need a nationwide network of individuals and organizations willing to align themselves permanently with the fate of our watersheds and free-flowing rivers. We ignore the laws of nature to our own peril. When we begin to care for the streams and rivers, we not only benefit ourselves, but also offer hope for the future to coming generations.

[How to Save a River: A Handbook for Citizen Action by David Bolling, 1994, Island Press, Washington, DC, may be ordered from the River Network, P.O. Box 8787, Portland, OR 97207-8787. Phone: (800) 423-6747. Enclose \$14 plus \$4 for shipping and handling.]

Urban Runoff Management Summarized

by Thomas R. Schueler, Center for Watershed Protection, from *Watershed Protection Techniques*, vol. 1, no. 3, (Fall 1994).

Fundamentals of Urban Runoff Management—Technical and Institutional Issues is an ambitious new publication that takes on the difficult challenge of trying to summarize the state-of-the-art with respect to urban runoff management. It attempts to go well beyond existing references by providing in-depth material on both the technical and institutional aspects of urban runoff management. And, in both areas, it delivers.

The 302-page publication is evenly split between a condensed technical summary of what is known about urban runoff and its control, and an excellent review on how it can be implemented by local and state government. The publication is national in scope, reflecting the geographic diversity of its four authors, who hail from Delaware, Florida, New Jersey, and Washington state. It also reflects their 80 years of collective experience in the field. Whenever a book is written by committee, there is always a strong probability that it will be choppy and uneven. The four authors, however, have crafted a well-written manual, and present a unified perspective on the subject.

The 16 chapters are split evenly between technical and implementation issues and are supported by many recent literature citations from both the East and West coasts. The manual gives good treatment to several emerging areas in urban runoff management, such as recent developments in sediment monitoring, biological community assessments, inspection/maintenance, and watershed management.

The true test of a good manual is how bad it looks on the shelf after a few years. *Fundamentals* will certainly become a dog-eared reference that is worn out by frequent use.

The reader might be surprised to learn that the manual started as a 9-inch thick stack of material presented at workshops in Chicago (and elsewhere) during 1992. The authors have done a painstaking job of condensing this material into a concise and readable format. The manual is accessible to planners, engineers, landscape architects, and public works officials that want to start or refine their urban runoff control programs.

[*Fundamentals of Urban Runoff Management—Technical and Institutional Issues* by R. Horner, J. Skupien, E. Livingston and E. Shaver, published by U.S. Environmental Protection Agency and the Terrene Institute, may be ordered from Terrene Institute, 1717 K St., NW, Washington, DC 20006 for \$35 plus \$5 shipping and handling. Phone: (202)-296-4071.]

Hal Wise Award Established

EPA Office of Water has established the Hal Wise Award in honor of Hal Wise, founder of *NPS News-Notes* and its editor until his death in March 1994. The award will be given annually to a person who shows exceptional leadership in promoting the control of nonpoint sources of water pollution and the ecological management and restoration of watersheds. In 1994, the award was given for the first time to Hal Wise.

On October 17, 1994, EPA's Nonpoint Source Control Branch Chief Dov Weitman presented the certificate to Hal's wife, Judy. He said:

EPA is pleased to present the first annual Hal Wise Award to Hal Wise himself . . . Hal drew upon his long and distinguished career working with the state and local governments throughout the United States on a variety of environmental and land planning issues. Hal quickly realized that, to be effective, a publication needed to reach out to a broader community of persons interested and involved with the "water-related environment" . . . Hal's clear vision, informed insight, long-accumulated wisdom, and laser-beam focus enabled him to fashion a news journal that could unite readers of often disparate viewpoints and backgrounds in the common cause of improving the condition of our . . . environment.

The Office of Water will establish a process to nominate candidates and select an annual winner. The process will be announced in an upcoming issue of *News-Notes*.

Wheat and Water Quality:

Wheat Growers Release BMP Manual

The trend in environmental protection is toward cooperation among public and private organizations at least in part because the magnitude and nature of nonpoint source pollution is often beyond the ability of government to solve alone. Thus, EPA and other organizations are developing government and industry partnerships to take on these tasks.

One example of these partnerships is *Best Management Practices for Wheat: A Guide to Profitable and Environmentally Sound Production*, recently released by the National Association of Wheat Growers Foundation and the Cooperative Extension Service. This BMP manual, funded in part by a grant from EPA's Office of Wetlands, Oceans, and Watersheds, provides information on wheat growth, economics of BMPs, erosion, and nutrient and pesticide management. It includes one- and two-page fact sheets on 39 BMPs that prevent or reduce pollutant entry into surface or groundwater.

Availability, Detachment, Transport, and Deposition

The manual is built around four basic principles: pollutant availability, detachment, transport, and deposition. According to these principles, pollutants are first made available (e.g., from an excess of nutrients), then detached (e.g., by rain), transported to a waterway (e.g., by overland flow or rill erosion), and finally deposited in a new location (e.g., into a filter strip or sediment basin). The focus on these principles allows the grower to understand the mechanics of erosion and pollutant movement.

According to the manual, the best way to address a problem is to reduce the availability of pollutants or prevent the detachment of sediment. Addressing availability and detachment is often the most cost-effective treatment and the basis of pollution prevention.

The manual describes, for each of the 39 BMPs, the BMP's definition, purpose, principles and strategies: how it works, and where it works best. The sections on conservation and structural BMPs include charts showing the relative costs of these practices and their effects on controlling environmental problems.

In most cases, several BMPs will be needed to address all resource concerns. Nutrient management, for example, consists of several BMPs, including setting realistic yield goals, soil testing and plant analysis, nitrogen timing and rates, manure management, nutrient placement methods, and soil and site evaluation. By selecting BMPs to meet certain goals for resource management, the grower can ensure that such concerns are adequately addressed.

Management goals are included for each potential pollutant, including erosion, nutrients, and pesticides. The goals include meeting the erosion component of the Natural Resource Conservation Service's Conservation Management System, developing and implementing a

Wheat and Water
Quality:
Wheat Growers
Release BMP
Manual
(continued)

nutrient management plan, and using integrated pest management (IPM) strategies. Growers must apply their own judgment in selecting the BMPs to meet these goals to ensure protection of the resource.

The manual concludes with a short section on "Planning Your Own BMP System." This section helps the grower address specific concerns, select specific BMPs to implement, and finally, to devise a partial budget for determining the BMP's economic impact. The National Association of Wheat Growers Foundation has piloted several BMP workshops to educate its members on the content and use of the BMP manual. Workshops for all 21 Foundation-affiliated states are scheduled for 1995.

[For more information on the BMP manual and associated educational programs, contact the National Association of Wheat Growers Foundation, 415 Second St., N.E., Suite 300, Washington, DC 20002-4993.]

Satellite Teleconference on Nonpoint Source Pollution Prevention

Cornell Cooperative Extension will broadcast a satellite nonpoint source pollution prevention course on February 14, 1995, from 9 a.m. to noon. A previous "telecourse" covered basic information essential to developing effective water quality protection programs and drew 520 participants.

February's broadcast will include tapes on watersheds and watershed hydrology, a brief update on water quality regulations, and an introduction to targeting and prioritizing water quality problems. Reviews of recent research and experience indicating that technical expertise and cost-sharing dollars can be targeted in ways that will optimize water quality benefits will be included. A grassroots targeting effort taking place in Washington County, New York, will also be presented by key participants in the process.

The course, originally designed for Cooperative Extension Association personnel, is accessible and useful to a broader audience of professionals, local government officials, and concerned citizens.

Funding is provided by Cornell Cooperative Extension, U.S. EPA, the New York State Department of Environmental Conservation Section 319 Program funds, and the Extension Service, U.S. Department of Agriculture.

[For more information, including coordinants and course materials, contact Deborah Grantham, Department of Soil, Crop, and Atmospheric Sciences, 145 Emerson Hall, Cornell University, Ithaca, NY 14853-1901. Phone: (607) 255-4931.]

Great Lakes Report Identifies NPS as Major Ecosystem Stressor

A recent report prepared by the Nature Conservancy for the U.S. EPA's Great Lakes Program identified nonpoint source pollution from agricultural activities as a major stress on the Lakes' biodiversity. The report, *The Conservation of Biodiversity in the Great Lakes Ecosystem: Issues and Opportunities*, describes the use of state and provincial historical data to analyze biodiversity; identifies and evaluates stresses; and recommends strategic protection activities. To obtain a free copy, contact U.S. EPA, Great Lakes National Program Office (G-9J), 77 W. Jackson Blvd., Chicago, IL 60604; or contact Romy Myszka. Phone: (312) 353-8034, FAX: (312) 353-2018.

Datebook

DATEBOOK is with the cooperation of our readers. If you would like a meeting or event placed in the DATEBOOK, contact the *NPS NEWS-NOTES* editors. Due to an irregular printing schedule, notices should be in our hands at least two months in advance to ensure timely publication. A more complete listing can be found on the *NPS BBS*.

Meetings and Events

1995

February

7-9

Third STORET Modernization Workshop, Dallas, TX. Contact: U.S. EPA, Office of Water, STORET User Assistance, 401 M Street, SW, Washington, DC 20460. (800) 424-9067. Internet Address: storet@epamail.epa.gov.

1995

February

- 23-24 *Water, Nitrogen, and People: An International Conference*, Everett, WA. Contact: Craig MacConnell, Washington State University Extension, Whatcom County, 1000 North Forest St., Suite 201, Bellingham, WA 98225-5594. (206) 676-6736. Sponsored by WSU Cooperative Extension, Washington State Department of Health, BC Environment, and U.S. EPA. Focuses on sustainability of the water resource and understanding the effect of nitrogen on water. Targets health officers, land use planners, public policymakers, agricultural commodity groups, environmental groups, tribes, local governments, conservation districts, and agricultural and water quality professionals.
- 27-28 *Stormwater Management Modelling Retreat*, Toronto, Canada. Contact: Lyn James, CHI, 36 Stuart Street, Guelph, ON, Canada N1E 4S5. (519) 767-0197. FAX: 767-2770. In three parts: 2/27 Hands-on short course on the USEPA SWMM model, with PCSWMM for Windows—Introduction; 2/28 Advanced Instruction.
- 28—3/3 *International Erosion Control Association's 26th Annual Conference and Trade Exposition*, Atlanta, GA. Contact: John T. Price, IECA Program Chair, Price & Company, Inc., 425 36th Street, SW, Wyoming, MI 49548. (616) 530-8230. FAX: 530-2317. Topics include policy and management practices; methods and techniques; case histories; research and development; product introduction; and special topics.

March

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- 2-3 *1995 Conference on Stormwater Management and Water Quality Modelling*, Toronto, Ontario. Contact: Evelyn James, CHI, 36 Stuart St., Guelph, ON, Canada N1E 4S5. (519) 767-0197. FAX: 767-2770. Sponsored by the American Society of Civil Engineers Water Resources Research Council, U.S. EPA, and the Ontario Ministry of Environment and Energy.
- 12-16 *International Conference on Water Resources Management in Arid Countries*, Muscat, Oman. Contact: Dr. Glenn E. Stout, International Water Resources Association, University of Illinois, 1011 Peabody, Urbana, IL 61801.
- 14-16 *Using Ecological Restoration to Meet Clean Water Act Goals*, Chicago, IL. Contact: Bob Kirschner, Northeastern Illinois Planning Commission, Natural Resources Department, 222 Riverside Plaza, Suite 1800, Chicago, IL 60606. (312) 454-0401, ext. 303. FAX: 454-0411. Sponsored by U.S. EPA Region 5 and Headquarters Watershed Branch, SCS, and the Northeastern Illinois Planning Commission. Audience is environmental professionals interested in and responsible for applying cooperative and interdisciplinary approaches for restoration, protection, and maintenance that incorporate natural ecological processes to meet Clean Water Act goals for aquatic and related upland ecosystems. Plenary sessions provide an overview of ecological principles and an analysis of alternative definitions for "ecological restoration." Breakout sessions on the topic will be organized by geographic region and type of resource.
- 17-19 *1995 New England Environmental Network Conference*, Medford, MA. Contact: Center for Environmental Management, Tufts University, 177 College Ave., Medford, MA 02155. (617) 627-3486. FAX: 627-3099. Internet: cemtufts@igc.org
- 23-24 *Ozark Cavefish Conference II*, Springfield, MO. Contact: Brian D. Canaday, Fisheries Mgt. Specialist, MO Dept. of Conservation, 2360 North Mayfair, Springfield, MO 65803. (417) 895-6880. FAX: 895-6910. Tentative agenda includes state status reports from Missouri, Arkansas, and Oklahoma; research reports and invited presentations; and a panel discussion, "Where do we go from here?"
- 29—4/1 *Steering a Course for the Future: 3rd Gulf of Mexico Symposium*, Corpus Christi, TX. Contact: (800) 699-GULF. Presented by the Gulf of Mexico Program. Will address marine debris, toxics and pesticides, habitat degradation, nutrient enrichment, coastal erosion, public health, living aquatic resources, and freshwater inflow.
- 30—4/1 *Southeastern Lakes—Expectations and Opportunities*. Fourth Annual Southeastern Lakes Management Conference of the North American Lake Management Society, Charlotte, NC. Contact: Barbara Wiggins, Conference Chair, Mecklenburg County DEP, 700 North Tryon St., Suite 205, Charlotte, NC (704) FAX: 336-4391.

April

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- 1 *Toxic Substances in Water Environments: Assessment and Control*, Cincinnati, OH. Contact: Nancy Blatt, Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314-1994. (703) 684-2400. FAX: 684-2492. Technical data, research efforts, and innovations in toxic substance assessment and control will be addressed. Municipal and industrial operators, scientists, engineers, and regulatory agency staff will be provided with the most up-to-date information.

1995

April

- 23-26 *Water in the 21st Century: Conservation, Demand, & Supply—American Water Resources Association Spring Symposium*, Salt Lake City, UT. Contact: AWRA, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192. (301) 493-8600. FAX: 493-5844.
- 26-28 *Enhancing the States' Lake Management Programs*, Chicago, IL. Contact: Bob Kirschner, Northeastern Illinois Planning Commission, Natural Resources Department, 222 Riverside Plaza, Suite 1800, Chicago, IL 60606. (312) 454-0401, ext. 303. FAX: 454-0411. Cosponsored by the Northeastern Illinois Planning Commission, U.S.EPA Region 5 and Clean Lakes Program in cooperation with the North American Lake Management Society. Will focus on new lake assessment tools and management approaches.

May

- 14-18 *Water Resources at Risk—1995 Annual Meeting of the American Institute of Hydrology*, Denver, CO. Contact: Helen Klose, AIH, 3416 University Ave., SE, Minneapolis, MN 55414. (612) 379-1030. FAX: 379-0169. Purpose is to describe issues, management strategies, and technologies in hydrology, hydrogeology, and mining hydrology.
- 15-17 *International River Basin Management for Sustainable Development*, Kruger National Park, South Africa. Contact: Alan Vicory, Jr., International Program Committee, c/o Ohio River Valley Water Sanitation Commission, 5735 Kellogg Ave., Cincinnati, OH 45228. (513) 231-7719. Registration deadline January 31, 1995. Sponsored by the South African National Committee of the International Association of Water Quality (IAWQ), the River Basin Management Technical Division of the Water Institute of Southern Africa, and the South African National Parks Board under the auspices of the IAWQ's Specialist Group on River Basin Management.

June

- 4-10 *Solutions '95: A Congress & Exposition on Managing the Effects of Man's Activities on Groundwater*, Edmonton, Alberta. Contact: Allen Kerr (403) 429-1472.
- 25-28 *Water Resources and Environmental Hazards: Emphasis on Hydrologic and Cultural Insight in the Pacific Rim—American Water Resources Association 1995 Annual Summer Symposium*, Honolulu, HI. Contact: Raymond Herrmann, National Biological Survey, Colorado State University, Fort Collins, CO 80523. (303) 491-7825. Technical sessions will include island hydrology; natural hazards and hydrologic consequences; global change; international contrast and comparison; coastal zone hydrology; water management in coastal zones; remote sensing and GIS modeling; and Pacific Rim regional hydrology.

July

- 16-19 *Interdisciplinary Conference on Animal Waste and the Land-Water Interface*, Fayetteville, AR. Contact: Patti Snodgrass, Arkansas Water Resource Center, 113 Ozark Hall, University of Arkansas, Fayetteville, AR 72701. (501) 575-4403. FAX: 575-3846. The conference will be a forum for interdisciplinary, holistic discussion of animal waste, soil, and water interactions.
- 17-22 *Coastal Zone 95-Spotlight on Solutions*, Tampa, FL. Contact: Billy Edge, CZ 95 Program Committee, Ocean Engineering Program, Civil Engineering Department, Texas A&M University, College Station, TX 77843-3136. Session themes are building partnerships, managing ecosystems, and exploring the human dimension.

Calls for Papers—Deadlines

1995

January

- 30 *Third Thematic Conference on Remote Sensing for Marine and Coastal Environments*, Seattle WA, September 18-20, 1995. Contact: ERIM/Marine Environment Conference, PO Box 134001, Ann Arbor, MI 48113-4001. (313) 994-1200, ext. 3234. FAX: 994-5123. Internet: wallman@vaxb.erim.org. Sponsored by the Environmental Research Institute of Michigan.
- 30 *1995 Conference on Stormwater Management and Water Quality Modelling*, Toronto, Canada, February 27—March 3, 1995. Contact: Lyn James, CHI, 36 Stuart Street, Guelph, ON, Canada N1E 4S5. (519) 767-0197. FAX: 767-2770.

February

- 15 *Interdisciplinary Conference on Animal Waste and the Land-Water Interface*, Fayetteville, AR, July 16-19, 1995. Contact: Arkansas Water Resource Center, 113 Ozark Hall, University of Arkansas, Fayetteville, AR 72701. (501) 575-4403. FAX: 575-3846. Poster deadline 2/15.

Nonpoint Source NEWS-NOTES is an occasional bulletin dealing with the condition of the water-related environment, the control of nonpoint sources of water pollution, and the ecosystem-driven management and restoration of watersheds. NPS pollution comes from many sources and is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural pollutants and pollutants resulting from human activity, finally depositing them into lakes, rivers, wetlands, coastal waters, and groundwater. NPS pollution is associated with land management practices involving agriculture, silviculture, mining, and urban runoff. Hydrologic modification is a form of NPS pollution that often adversely affects the biological integrity of surface waters.

Editorial contributions from our readers sharing knowledge, experiences, and/or opinions are invited and welcomed. (Use the COUPON on page 27.) However, *NEWS-NOTES* cannot assume any responsibility for publication or nonpublication of unsolicited material nor for statements and opinions expressed by contributors. All material in *NEWS-NOTES* has been prepared by the staff unless otherwise attributed. For inquiries on editorial matters, call (202) 260-3665 or FAX (202) 260-1517.

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