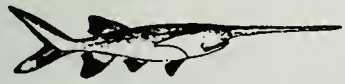
River Crossings

Volume 5 May/June 1996 Number 3

MICRA Paddlefish Report Available

The first year of the MICRA basinwide paddlefish stock assessment has been completed and is summarized in the following report: Oven, J.H. and F.C. Fiss. 1996. MICRA National Paddlefish Research - 1995 Interim Report. Mississippi Interstate Cooperative Resource Association, P.O. Box 774, Bettendorf, IA 52722-0774. 40 pp. Its Executive Summary follows:



paddlefish

"The Mississippi Interstate Cooperative Resource Association (MICRA) planned, organized, and initiated a long-term multi-state, multijurisdictional paddlefish study to assess the condition of paddlefish stocks throughout the Mississippi River Basin. In just ten months MICRA has successfully completed multiple tasks in order to provide the first interim report of this important national paddlefish research project. MICRA participants tagged and released 2,169 wild paddlefish and over 200,000 hatchery reared paddlefish into the basin's rivers by the end of 1995. A total of 4,128 rostrums were collected by MICRA cooperators. Of these fish 182 (4.4%) were tagged with coded wire tags. Thirty-four of these tags were actual MICRA tags that had been placed in wild paddlefish in 1995. Some of the tags recovered (142) originated from hatchery releases between 1988 and 1994. Movement data though cursory, showed that two of these hatchery fish had moved approximately 550 miles from where they were originally released only one year earlier.

This report summarizes the projects first year's efforts, and is therefore inconclusive. Data collection for this project occurs daily so figures and totals of tagged and recaptured fish are continually changing. Much of the first year's effort was devoted to planning, organizing, standardizing, and field training. Project cooperators participate on differing levels, accommodating both existing programs within their own states and participating beyond their borders on a

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basin-wide scale for the overall benefit of the resource.
The first paddlefish tagged and released for this project was in early 1995 at a meeting in Iowa where numerous state and federal biologists gathered to train for the study. The spirit of cooperation shown that day was to set the tone for the tasks that lie ahead. This unprecedented, cooperative project will undoubtedly help states and agencies better manage their natural resources, and enhance cooperation across borders. Thus beginning the process of decompartmentalizing our river resource management. Hopefully, through the cooperation and interjurisdictional management techniques set forth here, we can begin to learn the most effective processes required for big river management. Ultimately we may find new ways to enhance and protect our fishery resources and insure the future of the fishery throughout the Mississippi River Basin. Let this project stand as a guide for building the road maps required for this unique type of interjurisdictional management."

A limited number of copies of the report are available at the MICRA Office.

MICRA Topeka Shiner Report

The Topeka shiner has been petitioned for listing on the Federal list of Threatened and Endangered Wildlife, and the U.S. Fish and Wildlife Service (FWS) provided a grant to MICRA to complete a follow-up survey to one completed in 1992 by Dr. Bill Pflieger (MO Dept. of Conservation) in the state of Missouri. MICRA contracted with the Missouri Department of Conservation in 1994 for this work. The survey was completed in 1995 and the final report (Gelwicks, G.T. and S.A. Bruenderman. 1996. Status survey for the Topeka shiner in Missouri. Mississippi Interstate Cooperative Resource Association, P.O. Box 774, Bettendorf, IA 52722-0774. 15 pp. + Appendices) has just been received. It's abstract follows:

"Recent surveys conducted in Iowa, Kansas and Missouri indicate that the Topeka shiner (*Notropis topeka*) has declined throughout most of its historic range. This species is now a federal candidate C species, meaning that it is being considered for listing as an endangered species by the U.S. Fish and Wildlife Service. In 1992, W. L. Pflieger resurveyed 42 of 72 Missouri localities historically supporting Topeka shiners and found the species at only 8 sites. The purpose of our study was to resurvey 30 historic Topeka shiner localities not examined in 1992, and to survey 64 additional localities thought to potentially support the species. For this report, we combined the results of our 1995 survey, Pflieger's 1992 survey and other recent sampling efforts to obtain an accurate assessment of the current distribution and abundance of Topeka shiners in Missouri. Topeka shiners were found at only 14 of 72 (19%) historic localities in the state. We collected the species at six localities from which they had not been collected previously. Combined results confirmed the recent existence of populations of Topeka shiners in six drainage basins in Missouri: Moniteau Creek headwaters in Cooper and Moniteau counties, Bass and Bonne Femme Creeks (Bonne Femme Creek drainage) in Boone County, tributaries of Sugar Creek (Grand River drainage) in Harrison

River Crossings

Published by

Mississippi Interstate Cooperative Resource Association
(MICRA)
P.O. Box 774
Bettendorf, IA 52722-0774

River Crossings is a mechanism for communication, information transfer, and coordination between agencies, groups and persons responsible for and/or interested in preserving and protecting the aquatic resources of the Mississippi River Drainage Basin through improved communication and management. Information provided by the newsletter, or opinions expressed in it by contributing authors are provided in the spirit of "open communication", and do not necessarily reflect the position of MICRA or any of its member States or Entities. Any comments related to "River Crossings" should be directed to the MICRA Chairman.

County, Clear Creek and a tributary of Heath's Creek (Lamine River drainage), Cooper and Pettis counties, Dog Branch (Chariton River drainage) in Putnam County, and Cedar Creek (Des Moines River drainage) in Clark County. The species appears to have experienced recent population declines in all drainages except Moniteau Creek. Recent collections of relatively high numbers of adults and young-of-year Topeka shiners in Moniteau Creek suggest that the species is still viable in that drainage."

According to sources in the FWS, since the listing moratorium under the Endangered Species Act is now over, a proposal to list the Topeka shiner is anticipated in the very near future. This means that, within the next 12-18 months, we will likely see this species move from candidate to proposed status, and then to become a listed species provided Federal protection under the ESA.

A limited number of copies of the subject report are available at the MICRA office.

MICRA Freshwater Mussel SubCommittee Formed

The Mississippi Interstate Cooperative Resource Association (MICRA) voted unanimously at its fifth annual meeting held in Spirit Lake, Iowa in late May to form a Freshwater Mussel SubCommittee.

Al Buchanan (Missouri Dept. of Conservation) will be the new subcommittee's first Chairman. The subcommittee will focus its attention on implementing portions of the National Freshwater Mussel Strategy in the Mississippi River Basin.

Contact: Al Buchanan, Missouri Dept. of Conservation, (314) 882-9880.

American Rivers 1996 Most Endangered Rivers List

American Rivers' eleventh annual list of North America's ten "most endangered rivers" includes rivers

threatened by "mines, dams, pollution, flood control projects and the 1996 Summer Olympics." But *American Rivers* considers the 104th Congress to be the greatest threat to America's rivers

The list includes the Clarks Fork of the Yellowstone River in MT and WY; the American River in CA; the Upper Chattahoochee and Etowah Rivers in GA; the Missouri River; the Upper Hudson River in NY; the Columbia River System in OR, WA and ID; the Elk River in OR; Pinto Creek in AZ; the Penobscot River in ME; and the Animas River in CO and NM.

"For an unprecedented third year in a row," the Clarks Fork of the Yellowstone River in Wyoming and Montana was listed as the nation's "most endangered river". This was because of the New World mine proposed for an area about two miles northeast of Yellowstone National Park.

The mine owned by Crown Butte Mines, Inc. would generate about 5.5 million tons of waste to be stored in a 74 acre reservoir at the Clarks Fork headwaters.

In an effort to stop the "huge" New World mine, Sen. Dale Bumpers (D/AR) on May 8 introduced legislation placing a permanent moratorium on new mining claims in the region. Bumpers's proposed bill also would restrict mining activities on federal lands around the site and would prevent approval of mines that threaten to pollute water flowing into Yellowstone and other sensitive areas. According to Bumpers, "The message is not subtle. It's not intended to be".

American Rivers President Rebbeca Wodder praised Bumpers's bill and encouraged Senate Majority Leader Bob Dole (R/KS) and the GOP leadership to immediately schedule a hearing and vote on the issue. But Crown Butte President Joseph Baylis, which intends to mine the gold, said the bill is "just one more example of the project's opponents using rhetoric rather than reason".

For the third-straight year, the Missouri River also made the endangered list. At the center of the Missouri River debate is the U.S. Army Corps of Engineers' Master Manual, which controls the river's flow through six large mainstem dams. The state of Missouri has filed a lawsuit claiming this year's planned water releases will harm farmers by impacting navigation and cutting grain shipments. The lawsuit asks that this year's plan be voided.

The Corps' proposed "Master Manual" changes would have altered river flows to more closely mimic natural conditions. The Corps is now working on a revised alternative plan scheduled for release in early 1997, but Scott Faber, director of *American Rivers'* floodplain programs said navigation is still considered the primary interest. "There are few other rivers where such an important decision will be made this year," Faber said. "An honest review would show there are very few economic benefits to Missouri River navigation."

John Ferrell, spokesman for the Corps' Missouri River office in Omaha, credited *American Rivers*

with keeping a public focus on the debate. "I don't think anyone here is opposed to *American Rivers*," Ferrell said. What we're saying is that this requires a cooperative effort. And we're willing to engage in that dialogue."

In the meantime, *American Rivers* is encouraging governments to continue buying Missouri River bottomlands from willing sellers to set aside as a natural flood water conveyance corridor which would also provide for wildlife habitat. Several programs in Missouri and elsewhere are now working toward this end, including one by the U.S. Fish and Wildlife Service to create the "Big Muddy National Fish and Wildlife Refuge" between Kansas City and St. Louis.

A major Missouri River tributary, the Kansas River, made the *American Rivers'* list, of 20 other "threatened" rivers. The Kansas River, joining the Missouri at Kansas City, was listed because of high levels of herbicides from farm runoff and a proposed dredging project in one of its most pristine stretches.

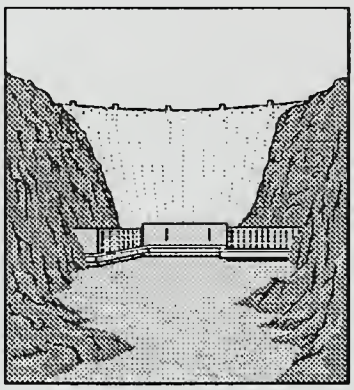
American Rivers said Congress should encourage practices to reduce farm runoff, rather than weakening or undermining agencies such as the Environmental Protection Agency through budget cuts or regulatory actions.

Sources: Columbia Tribune April 17, 1996, and Greenwire Vol. 5, No. 237 and Vol. 6, No. 10

Grand Canyon Flooding a Torrential Success

Artificial flooding of the Colorado River in the Grand Canyon in mid March "worked brilliantly," to restore beaches and wildlife habitat according to Interior Secretary Bruce Babbitt. The purpose of the simulated spring flood was to "stir up sediments and help restore natural conditions".

It will take another five months to fully analyze the results, "but the evidence so far...is that the experiment worked". "What we found", Babbitt said, "is really quite extraordinary. The success of this event exceeds, I think, even the most optimistic hopes of our staff of scientists". The beaches lining the canyon have grown by as much as 30%, Babbitt said. Moreover, 80% of the new beach sediment was deposited in the first 40 hours of flooding, and all the new deposits were in place within 100 hours, suggesting that future floods will not have to last for seven days.



Dave Wegner of the Bureau of Reclamation said, "The challenge for us now is to see how long they (the beaches) will last". Scientists found little damage to endangered birds, fish and snails that live in the canyon, noting that the flooding has created backwater channels that can serve as habitat for endangered fish like the humpback chub. Bird habitats, Native American sites and the dam and its flood-control facilities also remained unscathed by the flood.

Interior Department figures indicate that the March floods created at least 55 large beaches, and two thirds of the newly created beaches are in the canyon's first 61 miles, an area that has been "almost barren" of beaches since the dam was finished in 1963. In other findings, the "prized" trout fishery in Marble Canyon was not adversely affected by the flood, and backwater marshes "were scoured and restored" for endangered fish species. The resultant nutrient surge seemed to benefit all fish species.

The US Bureau of Reclamation and the US Geological Survey will continue gathering data and monitoring the beaches this summer. A final report on the findings is expected in September. Costs associated with the flood include $1.5 million for research work during the flood, and an estimated $2.5 million in lost electrical generating capacity. The final pricetag won't be known, however, until August.

Secretary Babbitt is touting the flood as "a very encouraging model for restoration across the American landscape". Possible targets for strategic flooding include the Florida Everglades, rivers in the Pacific Northwest, the Central Valley in California, the Mississippi River Delta and the Platte River.

Source: Greenwire Vol. 5, No. 232 and Vol. 6, No 18

Flooding and Application of GIS Technology

Interior Secretary Bruce Babbitt credited GIS technology as a major asset in garnering support for the recent Colorado River flooding experiment (see previous article). Babbitt made the following (summarized and paraphrased) comments at the ESRI - ARC/INFO User Conference in Palm Springs, CA, on May 21, 1996:

When the Interior Department first considered a different way of operating the Glen Canyon dam (including nature-mimicking floods) back in 1982, the idea

failed to take root. Almost everyone in the West understood that historic annual spring floods had been beneficial. But re-creating them after the dam was built would, they thought, jeopardize their own interests:

- Hydroelectric power users in six states opposed any plan in which water would have to be passed around the generators, and thus reduce their power revenue;
- Water users in the four states of the upper Colorado River basin threatened to sue on grounds that the proposed water releases would violate the storage provisions of the Colorado River Compact;
- Trout fishermen and the Arizona Game and Fish Department complained that an artificial flood would wipe out the trophy trout fishery below the dam;
- Rafting outfitters worried they'd lose business from public fears and schedule changes;
- All eight Indian tribes that border the Grand Canyon voiced fears that rising waters would destroy petroglyphs, burial sites and other sacred archaeological remains; and
- Even Interior's own Fish and Wildlife Service fretted that floods might damage the riverside habitat of an endangered bird species called the willow flycatcher.

There was simply no precedent on the Colorado River -- or as far as we know anywhere in the history of civilization -- for what Interior was proposing to do. So Interior assembled an interdisciplinary team of scientists called Glen Canyon Environmental Studies. These biologists, hydrologists, geologists and ecologists began to integrate, map and share their data toward a common base.

Once the scientists opened up their notebooks, maps and models, hydropower users took a second look at their own economic models. Soon they discovered that their own initial estimates of power revenue loss were at least two times too high. And as discussions widened, the utilities also realized that many power consumers were also sportsmen and environmentalists who favored restoring the river.

Then came the fishermen. Using a video display, scientists were able to create a virtual flood, allowing angling and outfitter groups to watch the water progress down the Canyon, submerging their favorite sandbars and shoreline camping spots. Not only were they assured that it was hardly a cataclysmic event, they were then drawn into discussing how a water surge might actually stir up nutrients in the system, and boost *Cladaphora glomerata*, the alga that has developed in the clear cold water below the dam and that forms the base of the aquatic food chain. This boost was later, in fact, precisely what occurred.

The Fish and Wildlife Service (FWS) -- still concerned about danger to endangered flycatcher nests and humpback chubs -- used flow models to assuage their fears. And when at the last minute they discovered an entirely new population of the endangered Kanab Ambersnail, they used the models again, in a preventative measure, to mark each snail then move them, one by one, farther up the bank to safety. In fact, GIS helped the FWS move forward with a non-jeopardy opinion that the flood would not cause lasting damage to them.

The Indian tribes, having lived on the land from time immemorial, were understandably skeptical of any more manipulations of a river already compromised by modern technology. One week before the scheduled flood, the Hualapai tribe threatened to seek a court injunction. But after looking in detail at the hydrologic work of the U.S. Geological Survey, tribal leaders concluded that archaeological sites would actually receive <u>more</u> protection because additional sediment deposited would protect the sites from erosion.

Finally, the camera crews and helicopters and national correspondents began to arrive, all full of healthy skepticism about how a deluge of biblical proportions could benefit anyone or anything.

That was two months ago. A week after the flooding, satellite photos of the river showed dozens of sparkling new sandbars protruding above the water, and lining the riverbanks. Some were piled 12 ft. high. Habitat was restored; fishing, rafting, power and water use quickly resumed without skipping a beat. Indian cultural resources remained undisturbed. In short, scientists found that the results exceeded their highest expectations.

The Glen Canyon example illustrates, in a most spectacular and complex landscape, how we, as a people, have begun to change the way we make decisions. And this change is now beginning in communities all across the country. I define here the word community in its oldest and truest sense: one in which people are united not by race, class, blood, work, or age...but by place. It is a community that identifies itself by the watershed

it shares: by the familiar neighbors, buildings, roads, weathers, soils, trees, birds, fish, crops and streams from which it lives. In scope that community may range as sparse and wide and complex as the Colorado River Basin, or as dense and small and complex as a city block.

GIS is not an end, but rather a means, it cannot be disembodied from our human values. The accumulation of data is meaningless unless it is underlain by a clear definition of our goals and our definitions about how we shall use and structure that science towards an informed, decision-making process.

As we used GIS as a tool to approach the complex challenges of Glen Canyon, that experience revealed three seminal lessons in how we, as a nation, shall reestablish strong, lasting, nourishing roots in our ever changing landscapes of complexity.

The first lesson is how GIS empowers us to see our landscape in an entirely new spatial dimension. We see not fragments -- structures, roads, minerals, animals, plants, water, soil -- but the whole watershed as one interconnected unit. Whether we call that unit an ecosystem, a landscape, or a web of life, it demands that we not take unilateral action before asking, then soon answering, how we can live lightly on this landscape and utilize its resources with forethought.

The second lesson from Glen Canyon is that sound decisions can only come through good science that is informed by local stakeholders. That means bringing more local stakeholders into the process of building consensus to resolve their conflicts. People instinctively assume that, like trench warfare, one party's gain must come at someone else's expense. And if denied a voice in the process, a lawsuit may prove them right. By contrast, Glen Canyon shows how traditional adversaries, once given a say in reaching the outcome, can occupy the same common ground for different purposes. Sometimes those adversaries can even work together to actually enlarge the returns for everyone within the watershed community.

Paradoxically, resource disputes will only be resolved if we first complexify them. Complex does not mean confusing. It simply means deliberately expanding the issues involved; bringing in more local stakeholders; asking parties to check their ideological positions at the door; and engaging them in a place-based, information-loaded inquiry that uses all the tools of good science and data presentation.

The final, and perhaps most important lesson from the Glen Canyon experience is that GIS plays a critical role by helping inform a complex democratic society such as ours. Many different individuals and groups expressed concerns about the effects of the flood - trout anglers, power users, Indian tribes, and regulatory agencies. Indeed, the Department registered 33,000 written comments, which broke down into 2,300 separate issues and concerns. GIS integrates that information and enables every stakeholder to make use of it.

As more of our citizens become involved in decision-making within their communities, it is our responsibility in the public sector to ensure that they have access to the best information available. Unfortunately, GIS is a very expensive proposition, and we have seen over and over again the value of providing data to members of the public, other agencies and other organizations in ways that they can ask questions and conduct their own analyses. Ignorance can be a powerful bias. Informed citizens will help shoulder the decision-making responsibility about land use, resource protection, and growth management issues.

Within the Federal government we have a policy that mandates public access to information. The Office of Management and Budget provides guidance specifying that all data and information collected with federal funds are accessible at no more than the cost of dissemination, unless specific laws prohibit this.

Many Federal agencies are now providing information free for the taking on the Internet and many package data on CD's at minimal cost to the public. These data are made widely accessible to other agencies, libraries and schools, and private companies that may redistribute the information. Within the Federal Geographic Data Committee we are working to ensure that standards and guidelines are in place to make these geographic data more usable.

I firmly believe that we must guide and empower every single community in America with the ability to put down roots in their own unique landscapes of complexity.

More Natural Management of Columbia River Water

A panel of scientists on April 24 said the Columbia River must be operated more like a natural river, and less like a series of stagnant lakes, if its dwindling salmon runs are to be restored. "In a preliminary report that could shake up the region's approach to salmon recovery," the panel, which was commissioned by the Northwest Power Planning Council (NPPC), concluded that current efforts to save salmon fall far short of what is needed.

The panel specifically urged that

some reservoirs be periodically drawn down to restore fish habitat. The panel's report found that barging salmon would be unnecessary in most places if the river were operated to simulate normal seasonal fluctuations. The report is "the first strong scientific statement" in defense of drawdowns.

chinnook salmon

The panel also concluded that fish hatcheries have been unsuccessful and should be curtailed and that more fishing controls would help prevent depletion of imperiled stocks. "Some hailed the scientists' briefing, a preliminary preview of a 500-page report due in June, as a potential turning point in the Columbia Basin's long, contentious battle between salmon advocates and commercial interest". Both industry and environmental leaders say the plan could pave the way for possible agreement on the salmon issue.

Source: Greenwire Vol. 6, No. 245

Round Goby Invasion

The round goby (*Neogobius melanostomus*) is the latest potential nuisance invader to the Mississippi River Basin's ichthyofauna. Like the zebra mussel, the round goby is now becoming established in the Great Lakes and may soon find its way into the Mississippi River Basin through the Chicago Ship and Sanitary Canal and down the Illinois River to the rest of the Basin. Its biology was described at a February 21-22 conference in Chicago organized by the Illinois Natural History Survey and Illinois-Indiana Sea Grant.

Round gobies were first found in North America in the St. Clair River, just south of Lake Huron, in 1990, along with the tubenose goby (*Proterohinus marmoratus*). Both species are native to the Black and Caspian seas. Tubenose gobies are "endangered" in Russia, but the Russian application of that definition is unknown. Both species have thrived in the St. Clair River and in Lake St. Clair downstream, where Michigan Dept. of Natural Resource trawl surveys catch them in large numbers.

The round goby has established two additional centers of distribution, in which it is abundant and spreading. These are Calumet Harbor on southern Lake Michigan, and the Grand River, a tributary to the central basin of Lake Erie. In all three locations, round gobies are caught in large numbers by anglers, sufficient to make angling for perch and walleye difficult (Tubenose gobies are not being caught by anglers.) Round gobies are said to be good-tasting, but bony. They are a major nuisance" for anglers in Lake St. Clair, but are a good fish for kids, because they are so easy to catch. The largest specimens in the Great Lakes have been about 180 mm (7 inches), but they get larger in their native range.

Round gobies have also been collected in Lake Superior (2 specimens in Duluth harbor in 1995) and Lake Huron (one specimen taken at Goderich, Ontario by an angler and photographed in 1994). A sighting in eastern Lake Ontario was made in 1995 by a qualified scientist, but no specimen was collected, so the sighting is treated as unconfirmed. So far, no round gobies have been found on the Mississippi River basin side of the Chicago Ship and Sanitary Canal. However, Illinois plans to look for them in 1996.

Round gobies have a fascinating, and not completely understood, life history. Females mature at one year of age, as small as 58 mm, and spawn every 20 days, up to six times, during the spring. Total fecundity is about 5,000 eggs. The eggs are cone-shaped and adhesive, clinging to rocks and other structure. Males guard the nests, and turn dark black when spawning. Males are said to die after spawning, but this may not always be the case. Males can live to be 5-6 years old. One hypothesis suggested to explain data on sex ratios and maturity is that females turn into males a year or two after spawning! Round gobies are benthic throughout their life, even when newly hatched.

As they grow, round goby diets switch from small benthos (chironomids and crustaceans) to mollusks. They eat large numbers of zebra mussels, about 70-80/day. Their pharyngeal teeth are ideal for crushing shells. They are selective for small zebra mussels, less than 9 mm in length. Round gobies 100 mm long can eat zebra mussels up to 15 mm long. Freshwater sponges were found in 1/3 of goby stomachs in one study; sponges are extremely difficult to identify in stomach samples, because they just look like partially digested mush. Round gobies eat some fish, and are cannibalistic. Many fish eat round gobies, especially smallmouth bass.

Male and female round gobies can generally be externally distinguished by their genital papillae. Round gobies have a distinctive black spot on their anterior dorsal fin, but about 20% of the Lake Erie specimens lack the spot. This appears to be unique in the species. Round gobies are difficult or impossible to age by scales, but Ohio State biologists think it can be done if one looks at many scales from a specimen. Otoliths may be better; University of Windsor biologists

are attempting to validate that technique.

Round gobies are often caught in trawls, but it is suspected that trawls are not very effective in sampling, because of avoidance behavior. Electrofishing is also not very effective because they stay close to the bottom when shocked. Angling has been used effectively to catch gobies, and SCUBA observations have also been useful.

Impacts on populations of mottled sculpins (*Cottus bairdi*) are already apparent. There is concern that the lake subspecies of mottled sculpin may be driven to extinction. Other species that may be affected include logperch and lake sturgeon. There is concern about predation on lake trout eggs and fry, but ongoing research by the Illinois Natural History Survey indicates that the mottled sculpin may be a more effective predator on lake trout than the goby. If round gobies colonize the Mississippi River Basin, there is concern about their impacts on darters, several of which are listed on the Federal List of Threatened and Endangered Wildlife.

Round gobies are behaviorally aggressive in defending optimal space. They are "smart" enough to turn over rocks to look for prey. They are larger than most competing species, feed in total darkness by sensing prey with their ultra-sensitive lateral line system, and they tolerate poor water quality. All of these factors give them competitive advantages over native species.

Concerns have been raised about the recycling of contaminants through the newly established food chains. Zebra mussels filter large quantities of lake water, and take up contaminants. Round gobies eat mussels, and are in turn eaten by larger fish. Preliminary modelling indicates that direct predation by gobies on zebra mussels does not result in contaminant bio-magnification, but adding the intermediate step of *Gammarus* feeding on mussel feces, then being eaten by gobies, does indicate possible bio-magnification.

Last summer, Minnesota Sea Grant recommended in writing to the Aquatic Nuisance Species (ANS) Task Force that the round goby be declared an aquatic nuisance as defined by law, and that a control program be developed. The ANS Task Force responded that more information is needed, and there is a clear process that must be followed.

Contact: Tom Busiahn, USFWS Ashland Fishery Resources Office, Ashland, WI (715) 682-6185

Illinois River Zebra Mussels

For the past three years Illinois River zebra mussel population dynamics has been studied at five locations (RM 181.0, 162.3, 66.8, 50.1, and 5.5). During spring 1993, a single settlement event produced a population explosion in the lower river (Alton Reach) with maximum densities of nearly 100,000/m^2. Second and third settlement events during late summer and early fall 1993 resulted in a much smaller population explosion in the middle river (La Grange and lower Peoria Reaches) with maximum densities near 15,000/m^2. By October 1993, the densest areas of newly settled zebra mussels at RM 5.5 and 66.8 had suffered 22% and 41% mortality, respectively.

During 1994, zebra mussel populations crashed at all study sites. Populations at RM 5.5 and 66.8 experienced greater than 99% population reductions between 1993 and 1994. In addition, very poor zebra mussel recruitment was recorded throughout the river in 1994. Successful recruitment was detected in June 1995 throughout the Alton and lower La Grange reaches, with average densities of new recruits increasing in a downriver direction from 100 to 2,000 $m/^2$. However, between August and October 1995 these newly settled populations virtually disappeared.

By October, mean density at three sites in the Alton Reach was 7/m^2 (16 m^2 sampled) and 0.2/m^2 (18 m^2 sampled) for sites in the La Grange Reach; only 109 adult zebra mussels (> 20 mm) were collected in the lower 120 river miles from thirty-four 1 m^2 quantitative samples.

Water level fluctuations during the past three years may have contributed to the rapid rise and fall of Illinois River zebra mussel populations. Elevated water levels corresponded to three recruitment events in 1993 (May, July, and Sept.) and one in 1995 (June) suggesting that only under flood events are Illinois River water quality factors suitable for zebra mussel recruitment and survival. Poor water quality factors such as low dissolved oxygen (<3.0 ppm), high water temperatures (>30°C), and high turbidity (> 600 NTU) were recorded during low water periods in the past three years. These three water quality factors may be why zebra mussels continue to do poorly in the lower Illinois River.

zebra mussel

In 1995 sampling with greater spatial resolution (i.e. a greater number of sites) revealed two additional discoveries one at RM 231-247 in the Starved Rock Reach and a second at RM 130 to 148 in the La Grange Reach, where no evidence of successful zebra mussel settlement (i.e. no live or dead zebra mussels or their

byssal threads attached to native mussels, rocks, woody debris, etc) were found. Secondly, during 1995, three densely populated sites (RM 37.8, 166.0, and 248.8) > 1000 $m/^2$ of large zebra mussels (25-43 mm) showed no evidence of mortality. This indicated that the dieoff observed in 1994 was not as complete as previously believed. However, by October 1995 the population at RM 37.8 crashed to a mean density of 14 live zebras $m/^2$.

Due to the persistence of source populations in Lake Michigan and the Upper Illinois River, future recolonization of the lower river seems likely. It is also possible that future generations of Illinois River zebra mussels may be more successful as they become more tolerant of fluctuations in water levels and poor water quality factors.

In a second study, from May 1994 through December 1995, zebra mussel veliger drift was monitored twice weekly at a single site on the Illinois River at Havana, Illinois (RM 121.1). Unlike adult populations, which exhibited high year-to-year variability, veligers showed a remarkable consistency in 1994 and 1995 in terms of total abundance and size distribution.

While the duration of spawning seasons differed in 1994 and 1995, total veliger abundance was estimated at 2.0×10^{14} and 2.0×10^{14}, respectively. The average veliger size was 109.6 micro gms in 1994 and 109.0 micro gms in 1995. Approximately 80% of veligers were between 95 and 135 micro gms for both years. The occurrence of distinct pulses of similar sized veligers drifting past the study site in both years indicated that veligers were being produced by distinct upriver populations rather than by a scattering of adults broadly distributed along the upper Illinois River. This corresponds with previous findings of others.

In July 1995 veliger cohorts were followed as they drifted from RM 121.1 to RM 0 (the confluence of the Illinois and Mississippi Rivers). Estimated veliger growth rates were 6.72 micro gms/day. At this rate, veligers produced by the northernmost adult population (RM 249) would be likely to settle in the Illinois River only if they drifted at an average velocity of <0.3 m/sec. Veligers drifting at an average velocity of >0.3 m/sec and settling within the Illinois River are most likely to have been produced by source populations in upriver tributaries such as the Des Plaines and Kankakee Rivers, or Lake Michigan.

Contact: Dr. Richard Sparks, Illinois Natural History Survey, LTRMP Field Station, 704 N. Schrader Ave., Havana, IL 62644, (309) 543-6000, FAX (309) 543-2105

Congressional Moratorium Lifted on ESA Listings

The U.S. Fish and Wildlife Service (USFWS) announced on May 10 that endangered species can once again be added to the official List of Threatened and Endangered Wildlife. Mollie Beattie, USFWS director said that the following priority system has been established for resuming endangered species listings:
1. Emergency listings of species in imminent danger of extinction;
2. Processing final decisions on species already proposed for listing, with highest priority given to species facing high magnitude threats; and
3. All other listing actions, including processing reclassifications and delistings, new proposed listings, petition findings, and critical habitat designations.

The Service's backlog includes:

- 243 proposed species that await final listing decisions,
- 182 candidate species that await proposals for listing,
- pending court orders to designate critical habitat for 7 species, and
- unresolved petitions to list or delist 57 species.

In order to clear the backlog, approximately 100 Service biologists who had been reassigned during the moratorium must be brought back into the endangered species listing program and they must review the proposed listings to be sure the information is up-to-date.

Beattie said the listing funds available for FY 96 are not adequate to allow the USFWS to meet all of its immediate responsibilities and that, in view of the time required to bring personnel back into the program and the limited funding available, it is unlikely decisions can be reached on all 243 proposed species by the end of FY 96.

Beattie also said the Service will be working with the Justice Department to ensure that lawsuits do not drain all the agency's resources for listing vulnerable species. There are currently more than 60 pending cases that concern listing and 10 outstanding court orders or settlements that address listing activities. The Secretary of the Interior also has received several hundred notices of intent to sue under the ESA.

TNC Report on Status of Aquatic Species

The Nature Conservancy's (TNC) NatureServe program released a report entitled, "Troubled Waters: Aquatic Ecosystems at Risk," on April 29, stating that a silent crisis is brewing beneath the surface of our nation's waters. The report further states that freshwater aquatic animal species are the

most imperiled group of species in the U.S. At risk are: 67% of freshwater mussel species; 64% of crayfish species; 37% of freshwater fish species; and 29% of amphibian species.

The report is based on data provided by state agency-based Natural Heritage Programs, a national network of biological data centers which tracks the location and status of rare plants, animals, and natural communities. The NatureServe program is designed to raise awareness of biodiversity conservation by sharing widely TNC's scientific knowledge and expertise. The program seeks to give scientists, policy makers and land managers effective tools to plan conservation efforts.

According to the report, the highest concentrations of imperiled freshwater animal species are in the southeastern U.S. and in the arid West. For four states, including Alabama, Florida, Georgia and Tennessee, more than 15% of their aquatic and wetland animal species are considered rare or imperiled. Alabama's aquatic animal species are in greatest danger, with more than 22% of its native aquatic species at risk. For nine other states, including Kentucky, Arkansas, North Carolina, Texas, and California, at least 10% of their native aquatic species are at risk.

The southeastern U.S. is home to many rare species of freshwater fishes, and the world's richest collection of freshwater bivalves (mussels) which have become extinct or endangered because of pollution, sedimentation, and damming and channelization of streams and rivers. Many of the West's freshwater species live in springs and rivers which are threatened by pollution, water diversion, and competition from non-native species.

The report cites four major reasons we should be concerned about the status of our aquatic species:

- stream-dwelling insects, mollusks, and crustaceans are indicators of environmental quality;
- aquatic and wetland species and natural communities provide environmental services and products that are important to humanity;
- undiscovered genetic and chemical compounds of aquatic species hold potential value for medical, agricultural, and industrial applications; and
- all living things are part of food chains; if changes in the supply and quality of water cause one species to die out, other living things become at risk.

The report also cites four major challenges to protecting aquatic species and natural communities:

- because watersheds and aquatic ecosystems are often very large, and aquatic species are affected by activities anywhere upstream in the watershed, aquatic species can be threatened by activities taking place even many miles away;
- resource use can conflict with aquatic habitat conservation objectives;
- despite laws and regulations designed to protect water quality, non-point source pollution -- such as the run-off of chemicals and soil from agricultural lands -- remains very difficult to control; and
- inventorying and monitoring aquatic species can be much more difficult than tracking land-based species.

TNC argues that to meet the complex challenges of protecting aquatic ecosystems, conservation agencies must continue to develop innovative tools and programs -- especially through public/private partnerships -- which can address the varying conditions and challenges of different watersheds. The report provides eight case studies which showcase a variety of aquatic conservation efforts across the country -- including the use of new agricultural methods, water rights allocation, and improved livestock watering practices. The case studies illustrate creative ways public and private land owners can protect aquatic and wetland species.

EPA Pesticide Report

Pesticide use reached record highs in 1994 and 1995, reversing a downward trend, according to a USEPA report made public recently by the Natural Resources Defense Council (NRDC) and the US Public Interest Research Group (PIRG). The groups "complained" that pesticide use was up even as Congress was preparing to consider bills the groups said would loosen pesticide regulations.

The EPA report, which had been scheduled for release in six weeks, said 1.25 billion lbs. of herbicides, insecticides and fungicides were used in 1995. In 1994, 1.23 billion lbs. were used, up more than 100 million lbs. from 1993. NRDC said the EPA report contradicted "industry claims that it is successfully promoting reduced use" of the toxic chemicals. According to an NRDC statement, "Many of these chemicals are acutely or chronically toxic, cause cancer, birth defects, are endocrine disrupters and can cause severe adverse health and environmental impacts.".

NRDC senior attorney Robert Kennedy said that current pesticide-use figures were double the amount used when Rachel Carson wrote "Silent Spring" in 1962. According to NRDC and PIRG, the EPA figures include only active ingredients, and not inert ingredients "such as petroleum, benzene and other toxic compounds, [which] can comprise [more than] 50% of the volume of formulated pesticides". The EPA confirmed the numbers' accuracy.

But the American Crop Protection Association (ACPA), the pesticide industry's trade association, said the report was misleading. It said overall pesticide use was up because more land was in production, while pesticide use per acre continued to decline. ACPA President Jay Vroom said, "Indeed, this pattern of decline has become evident as new products requiring lower application rates have come on the market, and as use of integrated pest management plans have grown".

NRDC and PIRG criticized two bills Congress may consider in June, both of which they said would repeal the Delaney Clause prohibiting cancer-causing chemicals in processed foods. They said the bills would preempt states from taking stronger measures than feds, including expanded right-to-know and reporting rules.

Source: Greenwire Vol. 6, No. 20

Land and Water Conservation Funds Diverted

The Land and Water Conservation Fund (LWCF), created in 1964, to purchase private lands for use as national parks and preserves is being "siphoned away with almost no public awareness.".

The LWCF takes in $900 million a year from offshore oil drilling royalties and is the largest source of federal funding for buying scenic lands. But since the early 1980s, Congress has routinely diverted most of the fund's revenues for other purposes. Only $138 million is set aside from the fund this year for parks. "As a result, logging, mining and housing development are occurring on private lands within some of America's most sensitive wild areas."

This year, Congress has eliminated all state grants under the fund, and announced plans to end the state grants program entirely starting next year. Since most of the public does not even know the fund exists, "there has been no real outcry."

Conservatives are split on the merits of the fund. Some Western GOPers have argued that the federal government already owns too much land. Others say that upkeeping the current staple of parks is a more important priority. Yet, some conservative, free-market groups support the fund, saying more money is needed to compensate private landowners who cannot develop, log, or mine their land because of the presence of endangered species.

Interior Secretary Bruce Babbitt on May 8 said he is working on a proposal to take the fund "off budget" so a full $1 billion can be spent on parks each year.

Source: Greenwire Vol. 6, No. 11

Arkansas River Water Issues

Colorado farmers this spring are "facing higher costs and more uncertainty" after the state issued new rules designed to stop overuse of Arkansas River water. The rules are in response to a 1995 U.S. Supreme Court ruling that found the state violated the 1949 Arkansas River Compact -- which divides the river's water between Colorado and Kansas by illegally diverting water from the river.

Both states have met with court appointed officials to determine what damages, either in money or water, Colorado must pay to Kansas. The final settlement may not be decided until 1997. Kansas would like to be paid in cash, while Colorado is pushing to pay with water.

If Colorado is allowed to pay with water, it must buy water rights, a move that could lead to more dry land in the Arkansas River Valley. According to Jody Grantham of the Colorado state engineer's office, "Some of the ways of paying Kansas back certainly will be through [drying up irrigated land.] ... It's going to put a lot of pressure on that valley".

Source: Greenwire Vol. 6, No. 5

Wisconsin Tribal Water Issues

Wisconsin on May 10 filed a lawsuit challenging the USEPA's decision to grant the Lac du Flambeau band of Chippewa Indians the right to set its own water-quality standards. The EPA on January 26 approved a petition from the tribe, which was seeking status as a state under the federal Clean Water Act in order to set water-quality standards for those waters that are located in or flow through the reservation's borders.

Wisconsin Attorney General James Doyle contends that EPA's decision to confer standard-setting authority to the tribe deprived Wisconsin of its exclusive sovereignty over state waters. Moreover, federal law only allows EPA to give tribes standing as states on matters related to Clean Water Act enforcement. Such state standing is conferred on a tribe only when it has its own government, enforcement mechanisms and title to the local water resources.

The Chippewa band's 1854 treaty does not grant the tribe sovereignty over navigable waters, according to Doyle, who "said there is no formal hearing process or other way to challenge the EPA's decision".

Source: Greenwire Vol. 6, No. 10

Texas and Pennsylvania Stream Water Quality

On March 27 the USEPA rejected Texas's request to lower its water quality standards for most east Texas streams, citing the chance that the proposed changes could harm the environment and not meet federal Clean Water Act requirements. Jane Seginaw, EPA regional administrator in Dallas, said that the Texas Natural Resource Conservation Commission's proposal to downgrade thousands of streams in East Texas to "immediate" quality aquatic habitat status was not backed by adequate science.

The change in status would have relaxed pollution standards for cities and industries. Texas environmental officials disagreed with the ruling, but enviros -- who asked the USEPA to block the plan -- saw it as a victory.

In the meantime in Pennsylvania because the Department of Environmental Protection (DEP) had allowed that state's lakes and rivers to grow increasingly more polluted, U.S. District Judge Louis Bechtle on April 17 ordered the USEPA to rewrite Pennsylvania water quality laws within 30 days. The ruling stemmed from a suit filed by the Raymond Proffitt Foundation, an environmental group. The group argued that since Pennsylvania's water pollution standards had fallen below those mandated by the federal Clean Water Act, the USEPA must issue new laws for the state.

The ruling "could have a broad economic impact on developers, industries and municipalities that want to discharge wastewater in state waterways." It could result in many Pennsylvania rivers and streams being reclassified as "high quality," a rating that imposes stricter controls on the discharge of pollutants into waterways. Such a reclassification could prove costly to emitters.

DEP and USEPA officials are currently working to recommend such a reclassification. The EPA has estimated in the past that the proposed change could affect as much as 85% of the state's rivers and streams.

Sources: Greenwire Vol. 5, No. 223, 238, and 240

Livestock Waste Legislation

Illinois Governor Jim Edgar (R) on May 21 signed a "comprehensive" package of livestock regulations aimed at preventing water pollution from manure runoff. The measures were negotiated by a coalition of farm and enviro groups in conjunction with state agencies.

The new law establishes a registration and inspection procedure for new manure lagoons, and requires all commercial-size livestock operations to have a manager trained in waste-handling techniques. Effective immediately, new or expanded livestock farms with up to 7,000 cattle or 17,500 hogs will have to be set back one mile from populated areas and a training program must be implemented for livestock producers. The Illinois Department of Agriculture gained authority under the law to inspect lagoons, monitor waste management plans and set up training.

But the parts of the bill addressing lagoon certification, registration and standards will be part of the rule-making process, involving a multi-agency committee and a series of public hearings. That process could push into 1997. Ellen Hankes of the Illinois Pork Producers said the new law will not impose too big a burden on producers. But Lynne Padovan of the Illinois Environmental Council said the enviro lobby would like to see the legislation strengthened in rule-making.

In the meantime in Iowa, the Senate on April 1 approved a bill that would eliminate special protection from nuisance lawsuits for livestock producers that have violated enviro laws three or more times in five years. However, tougher livestock regulation bills in Iowa "appear to be dead for the year".

Source: Greenwire Vol. 5, No. 229 and Vol. 6, No. 18

Forestry Association Adds Muscle to Its Principles

In 1994, the American Forestry and Paper Association (AFPA) adopted the *Sustainable Forestry Initiative Principles and Guidelines*. Starting this year, the association requires its more than 400 corporate and organizational members to comply with these guidelines as a condition of membership. Members account for 84% of the paper production, 50% of the solid wood production, and 90% of the industrial forestland in the United States. All must adhere to performance measures on their own lands and promote sustainable forestry on other private and public lands.

Besides strongly encouraging overall forest health, ecosystem

management, and public involvement, the guidelines contain several objectives and performance measures that specifically address water resources. One set of measures prescribes meeting or exceeding all Best Management Practices, all applicable state water quality laws and regulations, and the requirements of the Clean Water Act for forestland.

Members will have to establish riparian protection for all perennial streams and lakes and contribute funding for water quality research. Clear-cutting will be better managed, with size limitations and a "green up" requirement forbidding clear-cutting until adjacent areas have regrown. AFPA members also encourage good stewardship of all forestland by working with other landowners, contractors, and loggers-primarily by their support for education and training. Some members have even gone beyond this measure with programs like Champion Industry's "preferred supplier program," which purchases timber from loggers who have completed special training courses, according to Champion's Paul Krick.

AFPA's sustainable forestry initiative sets out specific reporting requirements to measure members' compliance, and the organization itself will issue an annual report reviewed by an independent expert review panel.

Contact: Rick Cantrell, AF&PA, 1111 19th St. NW, Washington, DC 20036, (202) 463-2432; Fax: (202) 463-2708

Source: Nonpoint Source News Notes, April/May 1996, Issue 44

Corporations Restore Riparian Areas

As members of the Wildlife Habitat Council (WHC), more than 100 corporations are now collaboratively managing over 340,000 acres of open space. The nonprofit WHC, created in 1988, encourages corporations to protect the environmental values of their lands and enhance them as wildlife habitats. So far, most WHC members are involved in upland habitat improvement projects, but some are also interested in the Waterways for Wildlife program that emphasizes riparian areas and wetlands.

Last year, Detroit Edison gave WHC a grant to coordinate the development of a management plan for the St. Clair River ecosystem shared by Michigan and Ontario. The plan will involve corporate, private, and public landowners in wetland, riparian, and upland habitat restoration projects.

Habitat enhancement is especially important to ecosystem or watershed-based approaches, say WHC representatives, because habitat affects water quality and biotic integrity. Another example of Waterways for Wildlife is the Cooper River Corridor Project in South Carolina, underway since 1993. Participation in the project, which is being led by Amoco Corporation, has ballooned to include 43 public, private, and corporate landowners working to improve water quality and enhance biodiversity on 70,000 acres along the river.

Currently, WHC says, 15 industrialized rivers bordered by 450 square miles of wildlife habitat are targeted for corporate collaboration on restoration or enhancement projects in the next five years. WHC gives special awards for Rookie of the Year and Corporate Habitat of the Year.

General Electric's Burkville, Alabama plant and DuPont's Victoria, Texas plant won 1995 WHC awards for stewardship. In addition, any WHC member companies who make a documented commitment to wildlife enhancement or environmental education are eligible for certification.

Contact: WHC, 1010 Wayne Ave, Suite 920, Silver Spring, MD 20910, (301) 588-8941, e-mail: whc@cais.com

Source: Nonpoint Source News Notes, April/May 1996, Issue 44

Cattlemen's Association Recognizes Good Stewards

Seven cattle producers won regional environmental stewardship awards in 1995 in the fifth annual recognition of good environmental stewardship sponsored by the National Cattlemen's Association (NCA) in partnership with Pfizer Animal Health. Much of the award-winning work used innovative methods to protect water resources while making businesses more profitable.

- The owners of Sitz Angus Ranch near Harrison, Montana, won an NCA regional award for helping the state improve an important trout-spawning area. They also diverted a creek that ran through their feedlot back to its original course to avoid contamination. They limit cattle access to the stream and have planted thousands of trees and shrubs along streambanks.

- Maryland's Antietam Meadows Farms near Sharpsburg, Maryland,

set an example for Chesapeake Bay producers with their commitment to water quality. Antietam Meadows cattle drink only from troughs-never directly from the nearby Potomac River-to ensure the integrity of the river's banks. The Poffenbergers, who manage the farm, have created a riparian buffer zone and turned 125 acres of tilled, highly erodible cropland into productive permanent pasture, eliminating nearly all erosion on their farm.

• The Mortenson family of Pierre, South Dakota, used a managed grazing system, among other things, to reduce soil erosion from runoff and increase the ranch's scarce water supply. Forage production has increased eightfold. "We've been able to improve the condition of the rangelands because we've managed the soil and water," said Clarence Mortenson.

Other regional winners were G.W. Jones and Sons Farm, Huntsville, Alabama; David Williams Farm, Vilisca, Iowa; and Babbitt Ranches, Flagstaff, Arizona. All seven winners were selected by a panel of experts, including representatives of the U.S. EPA, American Farmland Trust, Natural Resources Conservation Service, The Nature Conservancy, Texas Tech University, South Utah State University, Texas Agricultural Extension, NCA, and Pfizer Animal Health.

The Heritage Beef Cattle Company of Wheeler, Texas, won the national NCA Stewardship Award in January 1996.

Contact: Jamie Kaestner or Wendy Radakovich, National Cattlemen's Association, 5420 S. Quebec St., PO. Box 3469, Englewood, CO 80155, (303) 694-0305.

Source: Nonpoint Source News Notes, April/May 1996, Issue 44

Organization Promotes On-Farm Environmental Protection

Foundation E.A.R.T.H., a new organization that takes its name from its mission-Earth, Agriculture, Research, and Technology in Harmony is a nonprofit partnership of farmers and others dedicated to protecting the environment by supporting the adoption of technologically advanced, environmentally sound farming practices.

Formed only a year ago, Foundation E.A.R.T.H. revolves around the Harmony Farms Program. "If we can provide hard evidence of agriculture's environmentally responsible approach, we can begin to increase the public understanding of, and confidence in, food production," say the foundation's charter members. To yield that evidence, the program will depend on three types of projects:

• "Demonstration Farms" open to a wide range of invited groups will provide the why and how of environmentally friendly farming practices;

• "Development Farms" operated by farmers who work actively with established agronomic advisory groups will develop, manage, and monitor new technologies and farming practices; and

• "Self-Audit Farms," which may be any agricultural operation in the country that is willing to carry out a yearly environmental audit reassessing their farming practices in crucial areas.

Contact: Foundation E.A.R.T.H., 676 St. Clair, Suite 2000, Chicago, IL 60611

Source: Nonpoint Source News Notes, April/May 1996, Issue 44

Sediment/Nutrient Removal with Vegetated and Riparian Buffers

A study was initiated in 1990 to provide quantitative data on the effectiveness of vegetative buffers on removing sediment and nutrients as influenced by (1) soil and geomorphic conditions; (2) type of vegetation; and (3) hydrologic features of the site and runoff events. Two sites were chosen for the study - one in the Piedmont, the other in the Coastal Plain of North Carolina. At each site, an agricultural field was divided into six source areas: two were representative of the surface water flow, sediment, and chemical movement. The other four areas drained to grass buffers.

Two of the grass buffers were 14 feet wide; two were 28 feet wide and runoff from the field edges was dispersed at the top of two riparian plots. During a storm event, multiple samples were taken (up to 24) based on the runoff flow rate from the plots. Samples were analyzed for sediment and nutrient content, then matched with flow rates from the runoff to determine the flow-weighted average concentrations along with mass losses of sediment and nutrients.

A number of parameters had to be considered: surface conditions, including vegetative cover, land slope, and topography; and soil types. Data were collected for more than 50 storms in the Piedmont, and more than 60 in the Coastal Plain - all dealing with runoff hydrographs and sediment concentrations. Nutrient concentrations were analyzed for more than 25 storms.

None of the storm events have so far been large enough to inundate the grass buffers. On small rainfalls (one or two inches), no runoff resulted from the downslope edge of the grass buffers. Runoff through the

shorter, 14-foot buffers was reduced by nearly 80%; sediment was also generally reduced by 80% or more; and more than 50% of the sediment-bound nutrients were filtered by the grass buffers. Little or no runoff was measured during many of these events in the 28-foot buffers.

Runoff did occur on both lengths of grass buffers during larger storms (greater than two inches), but less in general from the 28 foot buffers. Sediment yield was less from the longer buffer length. The riparian buffers reduced both sediment and nutrients over levels measured in the field. The riparian buffers at the Piedmont site were forested and relatively steep so the flow tended to channelize during larger storms, resulting in little or no runoff reduction.

The Coastal Plain riparian buffer had a smaller slope and showed similar trends. This buffer was dominated by dog fennel, which offered little resistance to flow in summer and disappeared during the winter months. Even so, more than 50% of the sediment was removed during most storms and removal of nutrients in the runoff was almost as high.

Contact: J.E. Parsons, Department of Biological and Agricultural Engineering, North Carolina State University Raleigh, NC 27695-7619, (919) 515-6750, Fax: (919) 515-7760

Ecolotree Stream Buffer/Cash Crop

Louis Licht at the University of Iowa has developed a riparian buffer consisting of poplar trees that will reduce sedimentation and nutrient loading to a stream. A valuable commodity crop, the poplars can be harvested after five years as a cash crop for paper, construction material, or fuel.

Licht began his research in 1986 on the ability of hybrid poplar (*Populus spp.*) riparian buffers to remove nutrients from runoff. In 1991, with funding from the USDA Forest Service, the Center for Global and Regional Environmental Research, the University of Iowa, and the USEPA, Licht began a paired watershed study at Amana Farms (IA).

Licht trademarked the design used in his research, calling it the *Ecolotree Buffer*, to differentiate it from Natural Resources Conservation Service's grass or mixed-tree buffers.

The 1991 Amana Farms study compared two watersheds draining to a first-order stream. Watershed 1 was 103 acres, including 80 acres of cropland, and did not have a buffer along the stream. Watershed 3 was 283 acres, including 174 acres of cropland, and had a four-row riparian buffer with 15,000 poplar trees on each side of the stream. Native prairie species were planted in the understory of the buffers, and annual grasses and weeds were managed by mowing.

Measurements of sediment and nitrate nitrogen concentrations in runoff from both watersheds revealed the benefits of the riparian buffer. Sediment concentration in runoff measured during rain events was 647% greater from Watershed 1 than Watershed 3. Soil loss per row-cropped acre topped off at 3,408 lbs. in Watershed 1, in comparison to a 568 lb. loss from Watershed 3.

Testing of in-stream nitrate nitrogen revealed that only the unbuffered segment had nitrate concentrations in excess of the Maximum Contaminant Limit (10 mg/L) established by EPA. Nitrate nitrogen concentration in runoff was 69% less in Watershed 3.

Because the riparian buffers are designed as borders that follow the contour of the land and adjacent stream, they also provide a valuable edge-type habitat for wildlife. As perennials, the poplars develop into a more mature ecosystem than annual crops. Licht says the buffer can "develop soil structure, deep plant root systems, dense surface stem structure, and a diversity of life."

"The *Ecolotree Buffer* design makes it possible for farmers to grow a new commodity crop from perennial plants that require few pesticides, scavenge excess nutrients, and stabilize eroding soils," Licht explains. "It serves as a final filter for air, water, and soil between built and natural ecosystems." In addition, the buffer allows farmers to diversify from food commodities into other economic markets, including the energy/fuel commodity market.

Contact: Louis A. Licht, P.E., Associate Research Scientist, A 102 Oakdale Hall, Technology Innovation Center, Iowa City IA 52319

Environmental/Economic Balance

Sixty-six percent of Americans believe that environmental protection, economic growth and the health and happiness of communities can be achieved simultaneously, according to a nationwide poll by the Roper Research firm released on April 16.

Sixty-six percent of poll respondents also say healthy air and water is extremely important to a community, and 60% say they are extremely or very satisfied with the air and water quality in their own community. The poll also found about 23% of Americans defining a "New American Dream" that differs from the traditional one by focusing less on economic achievements like home and car

ownership, and more on grassroots involvement in local enviro, education and social welfare efforts.

The poll, commissioned by S.C. Johnson & Son, Inc., claims to be the first to measure American attitudes and actions toward sustainable development, "defined as meeting the needs of the present without compromising the needs of future generations." The survey is based on face-to-face interviews with 1,002 adults from September 30, 1995 to October 11, 1995.

Can these three goals -- Economic Growth, Environmental Protection and the Health and Happiness of People -- be reached together, or must we choose one over the others?

Can be reached together	66%
Must choose one over others	22
Don't know	12

When these three goals come into conflict, which do you think is more important?

Health and happiness of people	54%
Economic growth	14
Environmental protection	11
Depends on situation/issue	16
Don't know	5

How much effort should we be making now to improve the quality of our environment?

Major effort	62%
Some effort	33
No effort	3

How much effort should we be making now to reduce the use of chemicals?

Major effort	48%
Some effort	43
No effort	7

Do you think the following will be a serious problem for your children or grandchildren 25 to 50 years from now? -- Yes

Congestion of cities and highways	81%
Overpopulation	76
Severe air pollution	74
Severe water pollution	73
Health problems caused by man-made chemicals	73
Shortage of energy supplies	60

Source: Greenwire Vol. 5, No. 236

Conservation Plan Signed

Seven Cabinet-level agencies recently signed an unprecedented Recreational Fishery Resources Conservation Plan. The plan was required by President Clinton's Executive Order 12962, aimed at boosting recreational fisheries, signed and issued during National Fishing Week last year. Participating agencies include Interior, Commerce, Agriculture, Defense, Energy, and Transportation and the Environmental Protection Agency.

The conservation plan recognizes the vital role recreational fisheries play in the social, cultural, and economic well-being of American society. It calls for increasing recreational fishing opportunities nationwide by strengthening efforts to conserve, restore, and enhance aquatic systems. The conservation plan outlines strategies the seven signatory Federal agencies will pursue over the next 5 years to improve recreational fisheries within the context of their programs and responsibilities.

By the end of this year, each agency will develop a specific plan detailing actions to meet the goals of the conservation plan. Signatory agencies will design strategies to improve fisheries and their habitats and increase angling opportunities and access on Federal lands. To support these goals, the plan calls for increasing partnerships among Federal, State, Tribal, and private organizations and expanding efforts to educate the public about the value and need for healthy aquatic resources.

The plan includes "success indicators" to measure agency achievements in meeting the plan's goals. For example, Federal agencies will annually report how many areas were opened to angling use, how many new boat ramps or fishing piers were constructed, how many angler education programs were conducted, how many river miles supporting recreational fisheries were restored or enhanced, or the effectiveness of their partnership efforts.

Based on the agencies' annual reports, the plan's effectiveness will be evaluated each year by the National Recreational Fisheries Coordination Council and the Sport Fishing and Boating Partnership Council. The former, co-chaired by the Secretaries of Interior and Commerce, is made up of representatives of the Departments participating in the conservation plan. The latter is a Federally chartered advisory panel made up of sportfishing and boating advocates from the private sector and state agencies which advises the Interior Secretary on fishing and boating issues. The councils' responsibilities for reviewing the plan's success also were established under President Clinton's Executive Order on Recreational Fisheries.

Copies of the Recreational Fishery Resources Conservation Plan are available from the U.S. Fish and Wildlife Service's Publications Unit, 4040 North Fairfax Drive, Room 130, Arlington, Virginia, 22203, (703) 358-1711

Rhine River Cleanup

In 1987, Rhine River nations banded together to save the waterway, which then was heavily polluted with mercury, cadmium and sludge. Today, that drive appears to be a "spectacular victory" and the Rhine's "fortunes have undergone a dramatic

change."

The cleanup organized by France, Germany, Luxembourg, the Netherlands and Switzerland has met most of its goals. Lead, mercury and dioxin levels have been cut by 70%, while levels of chrome, nickel and heavy metals have dropped 50%.

Meanwhile, tighter industrial controls and modern waste treatment plants have made treated river water safe to drink again. The rising influence of the European Greens has also led government and business to take "more ambitious steps."

Chemical companies up and down the Rhine -- including Hoechst, Ciba-Geigy, Bayer and BASF -- are pouring hundreds of millions of dollars into research centers to find new ways to protect the river. That work has led to the "resurrection" of Rhine salmon: A group of French biologists in November found that salmon and sea trout had returned to the upper Rhine for the first time in 50 years.

The salmon now seem "poised" for a comeback, with many nations spending big money to clean spawning grounds and build fish ladders on hydroelectric dams. Still, nitrogen and phosphorous concentrations remain high due to fertilizer and pesticide runoff from farms.

Source: Greenwire Vol. 5, No. 222

Skin Cancer in Fish

Researchers have found a new breed of fish in Australian oases, "but many of the fish suffer from skin cancers scientists believe are caused by the Earth's thinning ozone layer." The new species, called the murgunda, is a three-inch long fish that dwells in shallow oases in Australia's desert outback.

According to the South Australian Research and Development Institute (SARDI), which discovered the fish, some 500 to 1,000 of the 8,000 member murgunda population had contracted sun-induced skin cancer.

Bryan Pierce of SARDI believes that various factors suggest that excessive ultraviolet light penetrating through the thinned ozone layer is responsible for the cancers. The cancers are unlikely to be genetic because the offspring of cancerous murgundas were normal. Also, those fish living in shady areas tend not to develop cancer.

Source: Greenwire Vol. 6, No. 18.

Meetings of Interest

July 9-12: Wetlands '96,: Forming Fair and Effective Partnerships and Workshop on Wetland, Floodplain and River Online Services and GIS Applications, Washington, DC. Contact: Association of State Wetland Managers, (518) 872-1804.

July 10-12: GREEN Conference of the Americas: Educating for Sustainable Watersheds, Ann Arbor, MI. Contact: Global Rivers Environmental Education Network. (313) 761-8142

July 14-17: Watershed Restoration Management: Physical, Chemical and Biological Considerations, Hotel Syracuse, NY. Contact: American Water Resources Association, (703) 904-1225.

July 15-19: River Morphology and Applications, Inn at the Pass Conference Center, Pagosa Springs, CO. Contact: Wildland Hydrology, (970) 264-7120.

August 3-7: Fifth National Volunteer Environmental Monitoring Conference, University of Wisconsin-Madison, WI. Contact: Celeste Moen, Wisconsin Self-Help Lake Monitoring Program. (608) 264-8878.

August 13-16: The DELTA: Connecting Points of View for Sustainable Natural Resources. Cook Convention Center, Memphis, TN. Contact: National Association of Conservation Districts, Delta Conference, 509 Capitol Court, NE, Washington, DC 20002, (202) 547-NACD.

August 15-19: International Conference on Wetland Systems for Water Pollution Control, Vienna, Austria. Contact: ICWS, Vienna 1996, Attn: Mrs. Eva Brauman, Nussdorfer Laende 11, A-1190, Vienna Austria.

September 22-28: INTECOL V International Wetlands Conference, University of Western Australia, Perth. Contact: UWA Extension Conference and Seminar Management, University of Western Australia, Nedlands, Perth 6907; 619 380-2433; FAX 619 380-1066; e-mail: uwext~uniwa.uwa.edu.au

October 23-26: 23rd Annual Natural Areas Conference and 15th North American Prairie Conference, Pheasant Run Resort

and Conference Center, St. Charles, IL. Contact Karl Becker, (217) 785-8774.

July 1997, III International Symposium on Sturgeon, ENEL Training Centre, Piacenza, Italy. Contact: Dr. P. Bronzi, ENEL spa - CRAM via Monfalcone, 15 - 20132 Milan (Italy) phone:+ +39-2 - 72243412 or 3452, FAX: + +39 - 2 - 72243496, E-mail: bronzi@cram.enel.it.

Congressional Action Pertinent to the Mississippi River Basin

Agriculture

P.L. 104-127, the Agricultural Improvement and Reform Act of 1996 (the Farm Bill) signed into law by President Clinton on April 4.

Fish & Wildlife

House on April 23 passed H.R. 160 to authorize appropriations to carry out the Interjurisdictional Fisheries Act of 1986 and the Anadromous Fish Conservation Act by a vote of 406 yeas.

Forests

S. 1590 (Murray, D/WA) "Public Participation in Timber Salvage Act of 1996" to repeal the emergency timber salvage sale program and for other purposes.

S. 1595 (Bradley, D/NJ) "Restoration of Natural Resources Laws on the Public Lands Act of 1996" to repeal the emergency timber salvage sale program.

S. 1647 (Pressler, R/SD) to amend the Forest Land Policy and Management Act to provide that forest management activities shall be subject to initial judicial review only in the United States district court for the district in which the affected land is located.

H.R 1089 (Cremeans, R/OH) ensures that acquisition of lands for inclusion in the National Forest System does not result in a loss of tax revenue to the affected county.

H.R. 1439 (Metcalf, R/WA) amends the National Forest Management Act of 1976 to require that the Forest Service timber sale program be financed only by receipts from the sale of timber under the program.

Government Affairs

S. 1001 (Glenn, D/OH) reforms the regulatory process, providing for cost-benefit analysis risk assessment of major rules, and calls for a review of existing rules.

H.R. 2500, (Michael Oxley R/OH) amends the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

H.R. 2827 (Saxton R/NJ) consolidates and improves governmental environmental research by organizing a National Institute for the Environment.

H.R. 3048 (Edwing, R/IL), "Regulatory Flexibility Amendments Act of 1996."

H.R. 3093 (Franks, R/CT) to amend the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 to establish a brownfield cleanup loan program.

H.R. 3105 (Wolf, R/VA) to amend the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 to exempt certain state and local redevelopment boards or commissions, and fresh start users of facilities purchased from those boards or commissions, from the liability under that act.

H.R. 3214 (Franks, R/CT), to amend the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 to establish a brownfield cleanup loan program.

Grazing

The House Resources Committee on April 25th approved a Republican-sponsored bill to overhaul federal grazing policy. The measure would raise grazing fees by 37% to $1.85 per animal unit month and give ranchers "greater say" in managing some 260 million acres of federal rangeland in the West. The bill now awaits House floor action. A similar Senate version was approved on March 21st.

Mining

S. 504 (Bumpers, D/AR) amends the Mining Law of 1872, imposing a royalty on mineral operations and reforming the process for mineral development.

S. 506 (Craig, R/ID) amends the Mining Law of 1872 imposing a royalty on mineral operations and reforming the process for mineral development.

S. 639 (Campbell, R/CO) amends and reforms the Mining Law of 1872 providing for the disposition of locatable minerals on federal lands.

Parks

S. 695, Senate Energy Committee panel held a hearing to provide for the establishment of the Tallgrass Prairie National Preserve in KS.

S. 964 (Johnston, D/LA) amends the **Land and Water Conservation Fund Act of 1965** giving the Interior Secretary authority to collect entrance fees at National Parks for direct use on priority park maintenance and repair projects.

S. 1695 (McCain, R/AZ) authorizes the Secretary of Interior to assess up to $2 per person visiting the Grand Canyon or other national parks to secure bonds for capital improvements to the park.

H.R. 260 (Hefley, R/CO) provides for a plan and management review of the National Park System, and reforms the process for considering additions to the system.

H.R. 1449 (Roberts, R/KA) provides for establishment of the Tallgrass Prairie National Preserve in Kansas.

H.R. 1846 (Richardson, D/NM) establishes the Yellowstone Headwaters National Recreation Area within Montana's Gallatin and Custer National Forests

H.R. 3317 (Williams D/MT) to establish the Yellowstone River Valley Heritage Area in Montana, North Dakota, and Wyoming.

H.R. 3318 (Williams, D/MT) to establish the Southwest Montana Heritage and Recreation Area in the state of Montana.

Public Lands

S. 93 (Hatfield, R/OR) amends the **Federal Land Policy and Management Act** providing for ecosystem management on public lands. Referred January 4 to Committee on Energy and Natural Resources.

S. 518 (Thomas, R/WY) limits federal acquisitions in states where 25% or more of the land is owned by the United States.

H.R. 2107 (Hansen, R/UT) amends the **Land and Water Conservation Fund Act of 1965** to improve the quality of visitor services provided by federal land management agencies through an incentive based recreation fee program.

H.R. 3198 (Calvert, R/CA) to reauthorize and amend the **National Geologic Mapping Act of 1992**, and for other purposes.

House Resources Committee panel on national parks, forest and lands on March 21 held an oversight hearing on federal lands and regulation of private property.

Recreation

H.R. 104 (Emerson, R/MO) rescinds fees required for use of public recreation areas at lakes and reservoirs under jurisdiction of the Army Corps of Engineers.

Refuges

H.R. 91 (Sensenbrenner, R/WI) prohibits land or water acquisition for the National Wildlife Refuge System if wildlife refuge revenue sharing payments have not been made for the preceding year.

S. 1013 (Conrad, D/ND) authorizes the Interior Secretary to acquire land for the purpose of exchange for privately held land for use as wildlife and wetland protection areas.

H.R. 1112 (Brewster, R/OK) and **S. 976 (Nickles, R/OK)** transfers the Tishomingo National Wildlife Refuge to the state of Oklahoma. House Resources Committee on held a hearing on **H.R. 1112** on May 9.

H.R. 1675 (Young, R/Ak) improves management and establishes purposes of the National Wildlife Refuge System. House on April 24 passed by a 287-138 vote.

H.R. 2679 (Barrett, R/NB) revises the boundaries of the North Platte National Wildlife Refuge

Executive Order 12996 issued by President Clinton on March 25 outlining the mission and purposes of the National Wildlife Refuge System (3/28 Federal Register, p. 13657).

Rivers

H.R. 1260 (Johnson, D/SD) ensures equity in and increased recreation and economic benefits from the Missouri River system.

H.R. 1331 (Furse, R/OR) creates a voluntary non-regulatory technical assistance and grants program within the Natural Resource Conservation Service's existing Small Watershed Program.

H.R. 2939 (Gunderson, R/WI) provides for a Congressionally authorized test of the Mississippi Interstate Cooperative Resource Agreement in the Mississippi River Basin. Resource Committee held a hearing on May 9.

Takings

S. 135 (Hatch, R/UT) establishes a uniform federal process for protecting private property rights.

S. 145 (Gramm, R/TX) provides for protection of private property rights.

S. 605 establishes a uniform system for protecting property rights and compensating landowners adversely affected by regulations. Approved for floor action on Dec. 21.

H.R. 9 (Archer, R/TX) creates jobs, enhances wages, strengthens private property rights and reduces the power of the federal government.

H.R. 971 (Wyden, D/OR) ensures that homeowners have access to information and opportunities to comment on actions that may decrease home values, and

establishes a compensation program for development that produces pollution or otherwise impacts home values.

Water and Wetlands

S. 626 (Hatfield, R/OR) amends the **Watershed Protection and Flood Prevention Act** establishing a technical assistance and grant program for waterways restoration.

S. 639 (Warner, R/VA) authorizes civil works programs for the Army Corps of Engineers which preserves the navigation of channels and harbors and provides for flood control and storm damage reduction.

S. 1601 (Levin, (D/MI) to amend the **Federal Water Pollution** Control Act to extend the deadline for and clarify the contents of the Great Lakes health research report, and for other purposes.

S. 1620 (Lautenberg, D/NJ) amends the **Water Resources Development Act of 1986** to provide for the construction, operation, and maintenance of dredged materials.

S. 1660 (Glenn, D/OH) to provide for ballast water management to prevent the introduction and spread of nonindigenous species into the waters of the United States, and for other purposes.

H.R. 198 (Smith, R/MI) amends the **Food Security Act of 1985** permitting conversion of wetlands smaller than one acre in size.

H.R. 961 (Shuster, R/PA) reforms and reauthorizes the **Clean Water Act**. Passed the House May 16, 1995.

H.R. 1132 (Oberstar, D/MN) amends the **Clean Water Act** providing for improved non-point source pollution control.

H.R. 1262 (Pallone, D/NJ) amends the **Clean Water Act** improving enforcement and compliance programs.

H.R. 1268 (English, R/PA) establishes a comprehensive program for conserving and managing wetlands.

H.R. 1438 (Lowey, D/NY) amends the **Clean Water Act** to provide funding to the states for estuary conservation.

H.R. 2940 (Hayes R/LA) entitled "Deepwater Port Modernization Act."

H.R. 3112 (Pallone, D/NJ) to amend the **Water Resources Development Act of 1992** relating to sediments decontamination technology.

H.R. 3113 (Pallone, D/NJ) to amend the **Water Resources Development Act of 1986** relating to cost sharing for creation of dredged material disposal areas, and for other purposes.

H.R. 3152 (Baker, R/CA) "Wetland Creation and Improvement Act."

H.R. 3217 (LaTourette, R/OH) to provide for ballast water management to prevent the introduction and spread of nonindigenous species into the waters of the United States, and for other purposes.

Source: Land Letter, Vol. 14, Nos. 17, 20, 24, 33 and Vol. 15, No. 2, 6, 11 and 14; and NOAA Legislative Informer, September 1995, Issue #15

River Crossings

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