River Crossings

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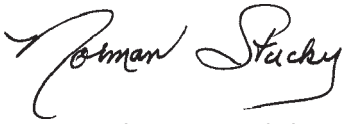
Readers Survey and Mailing List Update

In our continuing effort to keep River Crossings focused and in touch with our readers, we periodically conduct a Readers Survey to solicit your views on the publication and the issues it covers. The survey also gives us the opportunity to update our mailing list. So please fill out the enclosed survey form and return it to us. This is your chance to speak up and our chance to hear you. Also, if you are no longer a River Crossings reader and wish to be removed from our mailing list, please let us know. By the same token, if you know of someone else who would like to start receiving River Crossings let us know that as well. As always, we appreciate your continuing interest, cooperation and support in caring for our Nation's great rivers!



Norman P. Stucky, MICRA Chairman

A New Way of Doing Business

The Nation's fish and other aquatic resources are among the richest and most diverse in the world, and these resources have helped support the Nation's growth by providing enormous ecological, social and economic benefits. But despite the conservation efforts of the U.S. Fish and Wildlife Service (FWS) and others, a growing number are declining at alarming rates. Loss of habitat and invasive species are the two most significant threats. One-third of the Nation's freshwater fish species are threatened or endangered, 72% of freshwater mussels are imperiled, and the number of threatened and endangered species has tripled in the last 20 years. Clearly, there is increasing urgency to identify and implement actions that will reverse these alarming trends before it is too late.

In this interest, the FWS has worked with partners to refocus its Fisheries Program and develop a vision called "Conserving America's Fisheries". This vision focuses on working with partners to restore and maintain fish and other aquatic resources at self-sustaining levels and to support Federal mitigation programs for the benefit of the American public.

In cooperation with its partners, the FWS will use the Conserving America's Fisheries vision as a springboard to:

- Protect the health of aquatic habitats,
- Restore fish and other aquatic resources, and
- Provide opportunities to enjoy the benefits of healthy aquatic resources.

Development of the Conserving America's Fisheries vision began in July, 2001 when the FWS charged the Sport Fishing and Boating Partnership Council (SFBPC) to convene a Fisheries Steering Committee (FSC) representing perspectives from a broad array of stakeholders in fish and aquatic resource conservation to work with FWS Fisheries Program (FWSFP) managers to develop a new blueprint for the future. This provided the unique opportunity to engage partner input before the strategic vision was drafted.

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In January, 2002, the FSC provided the FWS with a set of consensus recommendations. This report, entitled "A Partnership Agenda for Fisheries Conservation," along with an earlier SFBPC report on fish hatcheries, entitled, "Saving a System in Peril," were keystone elements in developing the Conserving America's Fisheries vision. The new vision better defines the FWS role in conserving and managing aquatic resources than ever before.

The FWSFP consists of almost 800 employees nationwide, located in 64 Fishery Resource Offices, including a Conservation Genetics Laboratory, 69 National Fish Hatcheries, nine Fish Health Centers, seven Fish Technology Centers and a Historic National Fish Hatchery. Together, these employees and facilities provide a network that is unique among Federal agencies, State and Tribal governments, and private organizations in its broad on-the-ground geographic coverage, its array of technical and managerial capabilities, and its ability to work across political boundaries and take a national perspective. Also the Federal hatchery system has extensive experience in culturing more than 100 different aquatic species.

The FWSFP and its partners recognize the need to continue working together to identify and address needed actions to achieve shared management goals. The FWSFP and its partners also recognize that responsibilities for managing and conserving fish and other aquatic resources are shared, and success is usually contingent on partnerships that cut across jurisdictions and link all stakeholders and partners.

Resource objectives and Federal, State and Tribal roles have shifted over time. Where once the FWS focused primarily on restoring and managing game species, its conservation mission has expanded, and today also includes non-game and endangered species. Just as important, the FWS and its partners know that the opportunities, challenges, and needs facing aquatic resources exceed budgetary resources, as well as Federal authorities and responsibilities.

The Conserving America's Fisheries vision therefore set out the following seven priority focus areas:
- Partnerships and Accountability;
- Aquatic Species Conservation and Management;
- Public Use;
- Cooperation with Native Americans;
- Leadership in Science and Technology;
- Aquatic Habitat Conservation and Management; and
- Workforce Management.

These seven priority focus areas each have associated goals, objectives, and actions for the future. In some cases, they reflect a reaffirmation of current activities; and in others, they reflect some change in those activities. In a few cases, they reflect a new activity, thus providing opportunities to refocus and change within existing resource capabilities. However, the scope and speed with which this vision or blueprint for the future becomes reality will depend on the level of support and resources that are available to the FWSFP.

In evaluating current and potential actions, the FWS will consult with partners as key decisions are made which affect the direction of the FWSFP. FWS managers will also ensure that actions taken by the FWSFP are consistent with strategic plans being developed by the Department of the Interior and other branches of the FWS as a whole.

The FWSFP will use the following five criteria to decide what activities, opportunities, and issues to address under each of the seven priority areas listed above:
- The strength of Federal authority and responsibility;
- The extent to which FWS efforts will complement others in the fisheries and aquatic resource conservation community;
- The likelihood that FWS efforts will produce measurable resource results;
- The likelihood that FWS efforts will produce significant economic or social benefits; and
- The extent of partner support.

In recommitting itself to its role as a partner in conserving America's fish and other aquatic resources, the FWS will in some cases lead; and in others, facilitate or follow. However, in all cases, the FWSFP will focus its efforts and activities on issues that it is best positioned to address based on

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its unique resources and capabilities, recognizing that sound science and solid partnerships will continue to be the key to aquatic resource stewardship.

The FWS kicked off the Conserving America's Fisheries vision at a conference held on Washington, D.C. during the week of January 21, 2003. At that conference Interior Secretary Gale Norton announced that President Bush will seek a 16% increase for the FWS's national fish hatcheries for 2004. Norton said the president will also request a $1 million increase — up from $4.5 million this year — in the FWS budget to control aquatic invasive species. The $8.1 million increase in the hatcheries budget includes $2.5 million for hatchery restoration projects, $3 million for improving the hatchery system's aging structures and $1.5 million for the endangered species recovery program.

The success of this new "vision" will require continued fiscal support, but it will mostly depend on the commitment of rank and file fisheries managers and bureaucrats, both within and outside of the FWS, to (in some cases) remake and recommit themselves to the resource. A complete copy of the FWS Conserving America's Fisheries vision can be downloaded at:http://ifw2irm2.irm1.r2.fws.gov/fishery/natlfishconf/vision.html

Black carp: Threat to aquaculture?

Regular readers of River Crossings are aware of the controversy surrounding the use of black carp as a biological control mechanism for snails in fish farm ponds. We have covered this controversy in numerous past issues, so new readers are referred to our archives for backup information. MICRA's primary concern with the carp is that it will escape captivity, establish itself in the wild , and prey heavily on threatened and endangered mollusk and snail species. But in order to provide our readers with the "other side of the story", we have reprinted, in part, the following article that appeared under the same title in the 12/13/02 issue of the periodical Delta Farm Press:

"Only a tiny fraction of his business is in black carp, but Mike Freeze wants you to know it's terribly important...Without the black carp, fish farmers say, not only would prices at the fish buffet skyrocket but several parasites would rule Delta ponds.

'Freeze runs Keo Fish Farm in Keo, Ark... encompass(ing) about 1,200 acres of water and concentrat(ing) primarily on two species...The hybrid striped bass portion of our business probably makes up 45 percent of our gross income. Some folks prefer bass over catfish,' says Freeze, who is also an Arkansas Game and Fish commissioner ...Another 45 percent of Freeze's business comes from sales of sterile "triploid" grass carp — fish that eat aquatic vegetation... Triploid' refers to a method (discovered in 1983) of manipulating the chromosome numbers of a fish to produce sterility. A normal organism is diploid, meaning it has a set of chromosomes from mother and father. To produce a triploid, fertilized eggs are subjected to a sort of shock: either temperature or pressure. The resulting triploid fish can't reproduce.

'As part of the triploid grass carp program, most states allow such fish to be brought inside their borders only for vegetation control. This process is highly complicated and regulated. The U.S. Fish and Wildlife Service (FWS) is the agency that certifies such fish are sterile...'In 1995, the Triploid Grass Carp Certification Act allowed the FWS to run the program for a user fee...around 34 cents...Every fish we sell will have a blood sample taken to make sure it's sterile. After we do that, the FWS sends someone to run a second set of tests. There's a quality control aspect to this. Once those tests are run satisfactorily, the FWS issues documentation allowing us to sell the fish.'

'Between the bass and grass carp, that's 90 percent of our business. The other 10 percent is in ornamental fish, bait fish and a few acres of other things — including black carp'...Freeze became interested in black carp in the early 1990s because of problems with a parasite — the yellow grub — that appeared in his hybrid striped bass ponds...

'...An amazing pest, the parasite is transmitted through birds like great blue herons, egrets and other wading birds. When the birds defecate into pond water, the freed parasites swim around, searching for a snail. Once inside the snail, the parasite population explodes and leaves the snail in huge numbers. Fish are then targeted...The parasites, once they find a fish, burrow inside it and form a cyst about the size of a BB. Normally, these appear inside the flesh and if anyone cuts the nodules open he'll find a small worm inside. So, you can imagine the need to get rid of this parasite. No one wants to eat fish infected with live worms', says Freeze. Once inside the fish, the worms wait for a wading bird to consume its host. When the fish is eaten, the parasite then emerges in the bird's gut to start the cycle all over...

'...In the fingerlings we raise, the problem is if the 1-inch to 2-inch fish get infected, a lot of times — because they're so small — they'll die. Sometimes we've had whole ponds of fingerlings that we've had to destroy because of yellow grub infestation. That's major money.'

'The only way to control the yellow grub's life cycle is by removing the snails. It's impossible to get rid of the birds — all it takes is one landing near a pond for a short period. The fish can't be gotten rid of — that's where the business is. So that leaves the snails...If there were chemicals to use against the snails, that would be great. But there isn't an approved (or non-approved, for that matter) chemical available for snail eradication while fish are in the pond...'

'...Enter the black carp, also known as the 'snail carp.' In the early 1990s, with help from FWS, Freeze imported black carp from Israel and Taiwan. 'We wanted to use them as a biological control of snails. They work well stocked at a rate of five to 10 fish per acre. Since the carp are eating the snails, the fish are yellow grub-free. It works very, very well.'

'The black carp problem really started cooking when a new parasite (Bolbophorus confusus) showed up in Delta catfish ponds. This parasite, while sharing the same basic

black carp

life cycle as the yellow grub, is a totally different species. It uses host pelicans and then snails before hitting the catfish. Catfish are naturally resistant to native parasites — hence catfish have little worry with the yellow grub. But the new parasite is an exotic, and there's no clue where it came from. This parasite not only makes catfish inedible, it will also kill the fish. First discovered about eight years ago in Louisiana, several fish farms went out of business because of the pest.

'Well, after a bit, they began finding this parasite elsewhere in the Delta. Fish farmers — especially in Mississippi — began scrambling to find black carp to protect their catfish. Until the late 1990s, Mississippi's Department of Agriculture required only triploid black carp in ponds. When this parasite cropped up, though, there was a real concern that there wouldn't be enough triploid black carp to go around the 100,000 acres of Delta catfish ponds. So for one year, they allowed the sale of non-sterile black carp to Mississippi catfish producers.'

'When such actions were allowed, says Freeze, it created a tremendous uproar up and down the Mississippi River. Many states became concerned (and remain so) that there would be an escape of the fish. If it did escape, the argument went, the black carp would harm endangered species. As over two-thirds of U.S. freshwater mussel species are endangered or threatened and the fish are capable of eating up to 4 pounds of mollusks daily, says Freeze, 'that is a legitimate concern.'

'In both 1996 and 2000, a joint effort between different government agencies assessed risk associated with the black carp. The report said that all black carp to be used should be certified as triploids. The agency also said the carp shouldn't be used for control of zebra mussels, which was an idea early on...With that assessment, everything was quiet for a while. But a group called MICRA... soon stepped in....The group petitioned the FWS to list the black carp as an 'injurious species'...If they do that, the listed species may no longer be transported across state borders and can no longer be imported or exported from the country.

'The comment period on the proposed listing ended Sept. 30. All parties are still waiting to see what FWS' decision is...'If they list the black carp in such a manner, we'll still be able to use the black carp in Arkansas as long as the Arkansas Game and Fish Commission says it's okay. Mississippi has brood stock (although they've yet to produce offspring because the fish must be six years old to spawn), and they'll be able to work with black carp already living in their borders. But transporting black carp from here to there or back won't be allowed. Each state will be an island,' says Freeze.

'If FWS does what he expects and lists the black carp as injurious, one of the things Freeze admits to being concerned about is Mississippi producing triploid black carp properly. The procedure for producing sterile black carp is different from grass carp, he says. 'In 2000, I believe, some diploids were stocked mistakenly as sterile. The potential for something to go awry in that instance is frightening.'

'With several others, Freeze has gone to Washington, D.C., and met with the director of the FWS. 'We explained the situation, we explained that FWS helped bring the black carp in, that FWS was a part of the risk assessment. We pointed out that if this fish was listed as injurious, it would mean overlooking FWS' own risk assessment. Plus, because states will become 'islands,' the threat of viable, diploid black carp being stocked would be infinitely worse.' Freeze says the bottom line is that through an 'injurious' listing, the FWS would be exacerbating what they're trying to prevent. 'I think that may be why there's been no ruling yet. This is very complex and hopefully FWS is paying close attention to it. I'd guess they're going to list the black carp as injurious and take their chances. But nothing is certain.'

'Aquaculture needs the black carp until a replacement — whether chemical or otherwise — can be found to deal with the yellow grub, say fish farmers. 'There's nothing sacred about the black carp. Once we have some other way to control snails, who cares if it's here or not? Those who want the black carp gone say we can use copper sulfate and citric acid to deal with the parasite. Well, that only works in certain environments. You need very hard water, and it will kill 80 to 90 percent of the snails. That's not bad — but the black carp completely eradicates the snails. And if you still have 10 or 20 percent of the snails that escape treatment, that's enough to infect fish thousands of times over.'

'If the FWS insists on listing the black carp as injurious, Freeze and others have asked that designation only apply to diploids. "They need to still allow us to trade and ship the sterile black carp. At one time, they actually certified triploid black carp. Then, suddenly, they said they weren't in that business any longer. We asked why that was the case and were told, 'We feel that by certifying the triploids, we're advocating the use and dispersal of them.' 'Common sense went out the window in this whole thing."

Despite the viewpoints held by Mr. Freeze, critics believe that chemicals can control the parasite if the ponds are properly managed with periodic drawdown or draining and improved prophylactic measures. Also, other native species such as the reader

redear sunfish

sunfish have shown promise in research studies to be equally as effective as a snail predator as the black carp. Most likely, the whole issue really comes down to economics, and most disturbing is Mr. Freeze's mention that some diploids were mistakenly stocked in 2000. MICRA's Executive Board will meet in Little Rock in late February, and Mr. Freeze plans a field trip for them to visit the Keo Fish Farms.

Source: David Bennett, Delta Farm Press, 12/13/02

Daughterless Carp

Australian scientists hope to use genetically modified (GM) fish to wipe out a European species of carp that has invaded its rivers. By inserting copies of a gene called daughterless into the fish they hope to stop them from producing female offspring, which will eventually kill off the European species. "If you turn everything into a male, sooner or later the population collapses," said Ron Thresher of the CSIRO, Australia's national research organization.

Laboratory tests of the technique have shown it can work, but before the scientists can introduce the GM fish into rivers and streams, they have to prove its safe with further studies that could take several years. "The tests will assess a host of risks,

including whether or not the daughterless gene can move between species."
The carp, which originated in Europe, make up a large proportion of the fish in some river systems and are endangering native species. Thresher defended the GM strategy, saying it is better than poisoning the fish. "You don't end up with tons of dead carp floating down the river," he said. The magazine article appearing in New Scientist did not explain how the gene would be introduced into the fish.

Such a technique may have application in controlling bighead and silver carp populations that have "exploded" over much of the Mississippi River Basin.

Source: Reuters, 5/9/02

Transgenic Fish Issues

A recently released publication entitled, F u t u r e F i s h - Future Fish Issues in Science and Regulation of Transgenic Fish, published by the Pew Initiative on Food and Biotechnology addresses, in detail, the ecological and regulatory concerns related to transgenic fish. The following summarizes some of those issues. Readers are encouraged to review the complete document for themselves. It is published on the Internet at: http://pewagbiotech.org/research/fish/

In the broadest sense, genetic modification can refer to changes in the genetic makeup of organisms not found in nature, including hybrids (offspring of parents from different species or sub-species). To date, such fish are not commercially available in the U.S., but researchers have genetically modified at least fourteen species to enhance growth. These include several varieties of carp, trout, salmon, channel catfish, loach, tilapia, and pike.

Limited science makes it difficult to predict the probability of the many scenarios researchers have hypothesized, or to assess in advance the environmental consequences, which could range from benign to adverse. Adding genetic traits, not likely to occur in nature to artificially raised fish, elevates the concern that these transgenic fish may be more likely to survive if they escape, and therefore more likely to affect wild fish populations by interbreeding or by becoming an invasive species. If escapes did occur and the consequences were undesirable it would be difficult, if not impossible, to "recall" the escaped transgenic fish. To reduce these risks, developers of transgenic fish are perfecting existing methods and developing new ones to sterilize them in order to prevent the transgenics from spreading their transgenes to wild fish.

Evidence suggests that faster-growing transgenic species convert food more efficiently, reducing the cost of feed per unit of food produced in aquaculture applications. In addition, introducing disease-resistance traits to fish may enable aquaculturists to reduce costs associated with using antibiotics as well as costs incurred from fish losses due to disease.

However, if the farmed fish escape and mate with sexually compatible wild fish, those genetic differences — and their associated trait — can be introduced into the genes of the wild fish population. The heterogeneity of the wild population could then be reduced and biodiversity lost as the unique genetic qualities bred into farmed fish flowed into the wild population. Whether or not escaped farm fish pass their genetic differences on to their wild counterparts will depend on how those genetic differences affect the "net fitness" of the farmed fish. The term net fitness is scientific shorthand for the degree to which an organism succeeds at surviving and passing on its genes on to future generations. The environmental consequences could be benign, or negative, depending upon a variety of factors.

Some transgenic traits may decrease the net fitness of a fish, making it less likely to survive and pass its genes to future generations. The net effect of the following six traits fully determine the net fitness for any animal, including a transgenic fish:
- juvenile viability (chances of surviving to sexual maturity);
- adult viability (chances of surviving to procreate);
- fecundity (number of eggs produced by a female);
- fertility (percent of eggs successfully fertilized by male sperm);
- mating success (success at securing mates); and
- age at sexual maturity.

Some introduced genes may greatly improve net fitness and increase the impact the genetically modified fish could have on wild fish populations. Further, because those genes were not present previously in a fish population in a particular ecosystem, it is difficult to predict how those genetic changes will alter fish behavior or disrupt ecosystem processes. In assessing the potential of these risks, a number of factors need to be considered:
- the potential of escape,
- the possibility of gene flow to wild related fish populations, and
- the availability of risk management measures to reduce those risks.

Scientists use mathematical models to assess the potential for an organism — such as a transgenic fish that has escaped into a wild population — to either proliferate or die off. These models are not "fool-proof " and can not absolutely predict the outcome of a biologic process. The net fitness methodology requires first gathering data on the six fitness traits of both transgenic and wild fish in contained experiments and then entering the data into a computer simulation model. So far, few known studies are underway to measure the six fitness traits of transgenic fish lines intended for commercial use.

Depending on interactions among the six fitness components, the risk of gene flow can range from none to significant. When the net fitness of a transgenic fish is lower than that of its wild relatives, natural selection will quickly purge any transgenes inherited by wild relatives. It is realistic to expect that certain lines of transgenic fish, but not all, to fit this "Purge Scenario". Under this scenario, genes of the transgenic fish would ultimately disappear from the native fish gene pool, but disruption of the gene pool during that period could have longer lasting, subtle effects on the population. In a small population, even temporary declines in fitness could threaten the population's survival.

When the net fitness of a transgenic fish is equal to or higher than the net fitness of a wild mate, gene flow is likely to occur and the genes of the transgenic fish will spread through the wild population. Recent studies suggest that age at sexual maturity has the greatest effect on net fitness in this "Spread Scenario", followed by juvenile viability, mating advantage, female fecundity, and male fertility.

The possibility of a third outcome, the "Trojan Gene Scenario", suggests introduction of a transgenic fish with enhanced mating success, but reduced adult viability, into a wild population could result in a rapid decline of the wild population. Essentially, the mating advantage would drive the transgene into the wild population, rapidly spreading novel genes. But the

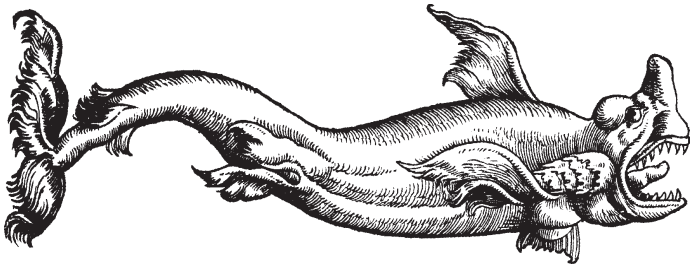
lower survival of each consecutive generation carrying the transgenes would eat away at the population size. An alternative form of this Trojan Gene Scenario is possible if the transgene increases juvenile viability — as might occur in fish engineered to contain a new disease resistance gene — but at the same time reduces fertility. Interbreeding between such transgenic fish and the wild population could trigger a dramatic population decline.

If novel genes do spread into wild populations, the possible environmental consequences are extensive. Fish communities (the interconnected groups of fish species and other aquatic organisms living in the same environment) have a level of resilience that enables them to recover from shocks caused by either nature (e.g., hurricanes) or humans (e.g., toxic waste spills) and then return to a state resembling a pre-shock condition. In contrast, a community that has lost resilience responds to major shocks by shifting, often rapidly and with only subtle warning, into an unstable and degraded state characterized by dramatic loss of biodiversity, for example, or sudden over-dominance by a nuisance species. Unfortunately, major gaps exist in the scientific understanding about what interactions among different aquatic organisms — and between organisms and their environment — drive the resilience of a fish community.

Another fundamental issue associated with escapes of transgenic fish is their potential to become an invasive, "exotic" species in an ecosystem lacking wild relatives. Invasion of aquatic environments by any exotic species, whether transgenic or not, raises concerns about potential environmental harm. The large-scale engineering of species already recognized as a pest or nuisance might raise the greatest concern about genetically modified fish. For example, scientists could intentionally engineer a member of a pest species, such as sea lamprey or zebra mussels, to spread a debilitating gene to a thriving, unmodified population once released into the wild. Although such an act could be a successful biological control, it would be critically important to consider evolutionary and ecological processes that might backfire on the biological control's objective.

A fit and fertile transgenic fish would be more likely than its nontransgenic counterpart to establish a self-sustaining exotic species population in the accessible ecosystem if its engineered genes conferred greater invasive ability. The functional equivalent of this scenario, sometimes called the "Establishment Scenario", may also occur if most invading transgenic fish are sterile, but enter the ecosystem in recurring waves of large numbers, with each wave replacing the earlier one as it dies off. This could occur through escapes from unsecured aquaculture operations or intentional fish stocking programs.

If transgenic fish become established, they may compete with or prey on threatened, endangered, or beneficial species in the invaded ecosystem, leading to either a decline in the affected species or to a coexistence between the two. The most severe consequence would be an accelerated decline in the abundance of an already threatened or endangered species, triggered by superior competitive ability or superior predation of the invading transgenic fish. If the established transgenic fish show increased competitive ability or predation success, a change in the abundance of at least one other species in the ecosystem is inevitable.



Even if sterility could be assured, release of sterile, so called triploid fish, into the environment presents certain hazards. Triploids of some species, while sterile, still have enough sex hormones in their bloodstream to enter into normal courtship and spawning behavior. Escaped sterile triploid fish could interfere with the reproduction of wild relatives by mating with fertile wild adults. The most severe consequence would be reproductive interference of declining, threatened, or endangered species. Finally, some sterile fish survive and grow beyond their normal life-span, perhaps because they do not expend energy on reproduction or enter senescence like fertile fish. In cases where large numbers of such transgenic fish enter the environment on a recurring basis, they might pose heightened competition with wild relatives or contribute to higher predation on other species.

The advent of transgenic fish thus adds another layer to an already complex regulatory regime. Federal policy, developed in the mid-1980s, treats biotechnology products no differently than products produced in more conventional ways. However, as biotechnology continues to develop, new applications raise questions as to what kind of "product" they are — and therefore which federal law applies. In the case of transgenic animals, including fish, the Food and Drug Administration (FDA) has indicated its intention to regulate them as "new animal drugs" under the Federal Food, Drug and Cosmetic Act (FFDCA) because the genetic construct used to create transgenic animals falls within the statutory definition of a "new animal drug."

As a result of this interpretation, developers cannot grow or sell transgenic fish until the FDA first has found that the fish are "safe and effective" as defined by the FFDCA. The FDA's intention to regulate transgenic animals (including fish) under the FFDCA's new animal drug approval provisions illustrates some of the challenges in applying existing authority to new biotechnology products. On one hand, using the new animal drug approval process allows regulators to ensure that transgenic animals such as fish are safe to eat before they come to market. On the other hand, there is significant legal uncertainty about the scope of FDA's authority under the new animal drug laws to deny approval or impose restrictions on the basis of potential environmental impacts that do not directly affect the health of humans or of the transgenic fish itself — such as impacts on wild fish species.

In addition, the new animal drug approval process provides very little opportunity for notice or public participation; indeed, the very existence of an application for approval remains confidential unless disclosed by the applicant. As the FDA has itself acknowledged, the procedures make it difficult to have the kind of open process required for environmental assessment. In short, it is difficult to know how the rules that apply to proving the safety and efficacy of traditional animal drugs will apply to transgenic animals, creating uncertainty for both industry and the interested public. The FDA, policymakers, industry, and the public interest community need to address these issues.

Further complicating the situation is the fact that a patchwork of federal laws addresses environmental issues raised by conventional aquaculture and spreads fragmented authority among different federal agencies. For example, the USEPA deals with water pollution issues posed by aquaculture facilities, while the Army Corps of Engineers considers environmental impacts as part of the process for issuing permits for aquaculture facilities in navigable waters. But no federal agency appears to have clear legal authority to regulate aquaculture facilities to avoid potential harm to wild fish communities, unless the wild fish are already threatened or endangered under the Endangered Species Act. Indeed, federal authority in this area is limited; so the primary regulatory responsibility for fisheries and aquaculture resides at the state level.

The current regulatory approach to transgenic fish thus represents an ad-hoc extension of existing regimes, and does not reflect a unified strategy necessary to address risks in a transparent manner that provides public confidence that these risks will be adequately considered and addressed.

In fact, the State of Washington recently became the first state in the nation to permanently ban cultivation of genetically-engineered fish, a largely symbolic step to protect natural stocks. The Washington Fish and Wildlife Commission (WFWC) enacted the ban in December after environmentalists argued that the risk was too great that the altered fish could escape and interbreed with wild fish. "This isn't the genie we want to take out of the bottle," said Shawn Cantrell, Northwest regional director for Friends of the Earth. "There are too many unknowns and possible downsides." The Washington State ban comes at the same time as the State for the first time adopted comprehensive rules for aquaculture. WFWC staffers recommended a two-year moratorium on altered fish, but environmentalists asked for and won the permanent ban.

But the FDA has yet to act on the issue and proponents predict they'll win the agency's approval. "We're confident we can bring forth sufficient scientific information to show these are both safe to eat and safe to use in the environment," said Joe McGonigle, vice president of Aqua Bounty, based in Waltham, Mass.

Source: F u t u r e F i s h - Future Fish Issues in Science and Regulation of Transgenic Fish, January 2003, Pew Initiative on Food and Biotechnology, 1331 H Street, NW, Suite 900, Washington, DC 20005, Telephone: (202) 347-9044, Fax: (202) 347-9047, Web Page: www.pewagbiotech.org; and AP, 12/25/02

Agriculture Scientists Pressured by Politics

University and government scientists studying issues associated with agriculture and agricultural pollution say they are harassed by farmers and trade groups and silenced by superiors afraid to offend the powerful industry. The heat comes from individual farmers, commodity groups and the U.S. Department of Agriculture (USDA), who finances and controls much of the research.

For example, scientists in Iowa and other states say that the USDA
• kills controversial research by forcing it through an extended approval process,
• keeps researchers from publicizing sensitive findings in scientific journals and at public meetings and
• cooperates with industry groups to suppress research results that don't meet the groups' satisfaction.
Such pressure tactics have been reported in the tobacco, pharmaceutical and oil industries, but they are every bit as intense, if not more so, in the agricultural arena.

"It's rampant," said JoAnn Burkholder, an aquatic botanist who received death threats after warning North Carolina parents not to let their children wade in a stream polluted with hog manure. Burkholder, a professor at North Carolina State University in Raleigh, drew a flood of demands for her dismissal in 1997 after publishing her data on the stream. It contained bacteria numbers 15,000 times higher than the state limit. She even received anonymous death threats against her dog! Burkholder's lab also tied sewage and manure pollution to a toxic organism, Pfiesteria piscicida, that can kill fish and sicken humans. "I have seen some very sad practices in this country," Burkholder said. "Industry has a stranglehold on environmental issues to the point that this muzzling goes on all the time," she said.

Phillip Baumel, a longtime Iowa State University (ISU) economist, said he faced retribution from the Iowa Corn Growers Association (ICGA) in 2000 after his study questioned the benefit of expanding the lock and dam system along the Upper Mississippi River. Corn farmers said the work would speed shipments and was worth the money. The ICGA objected to the study and its tardiness, and then declined to pay for it.

James Russell, a USDA scientist who works at Cornell University in Ithaca, NY, became embroiled in a public fight in 1999 with two scientists who he said had ties to livestock groups. Russell had published a paper showing that feeding hay to cattle instead of corn for a few days before slaughter reduced the odds of E. coli contamination in the meat. Russell abandoned the research after what he considered professional attacks on an Internet site and in a scientific journal. He declined to talk about why he stopped the research. But a Midwestern USDA scientist familiar with Russell's research and this particular situation said the USDA "marginalized" the work "after complaints from the beef industry and from universities." His superiors at the USDA Agricultural Research Service (ARS) told Russell they had chosen other labs around the nation for food-safety research. "They offered to let me work at the lab in Nebraska," Russell said, "but I chose to stay in New York."

On one front, the battle is for academic freedom, researchers say, but the implications reach much further. Microbiologist James Zahn, a former federal swine researcher at the ARS lab in Ames, IA said his superiors would not let him publish findings showing that air emissions from hog confinements contain potentially health-threatening antibiotic-resistant bacteria. And they wouldn't let him speak to citizens groups about the study after pork producers questioned his appearances. The work, they said, didn't fit the lab's mission. "The USDA has a long-term relationship with pork producers," said Zahn, who left his job at the Ames lab in May to join an out-of-state pharmaceutical firm. The ARS is one of the USDA's largest research divisions, with about 2,000 scientists, nearly half of which are involved in farm pollution issues in one way or another, said Miller Hays, ARS Spokeswoman.

Before leaving the ARS Zahn was eager to get the word out about his ground-breaking work. Antibiotic-resistant bacteria that grow in hog confinements, he said, can escape into surrounding water and air, and they could include organisms that make people sick while resisting common

antibiotic treatments. Zahn's studies were small but presented potential problems not widely reported elsewhere. One suggested that emissions from Iowa and Missouri hog confinements routinely violated federal pollution limits. The study on antibiotic-resistant bacteria in air near confinements drew wide attention among scientists and confinement opponents. But that attention had to build by word of mouth because Zahn's ARS bosses refused to let him submit a paper on his work for publication in scientific journals - something that normally is expected, and even required, of researchers.

Especially frustrating was the USDA's list of controversial topics that cannot be researched without approval from national headquarters, Zahn said. The list was changed, he said, to include his work on antibiotic-resistant bacteria. The list of subjects, according to the Des Moines Register, appears to require special permission to study anything involving agricultural pollution of air, water or soil. Hays said the actions on Zahn's antibiotics paper had to do with keeping his lab within its mission. The agency backs antibiotic research at some of its other labs, but Zahn's work didn't seem to fit in at Ames, she said. Research on any of the subjects on the list isn't necessarily forbidden, Zahn acknowledged, but such research could encounter delays, which in turn could result in loss of grant money. With no money to do the research, the work would be stymied anyway. "If people want to sit on it, they sit on it," Zahn said of his former superiors at the ARS regional office in Peoria, IL, and at the ARS information headquarters in Beltsville, MD. Hays said it can take a long time to get approval for research on a listed topic, but the long wait isn't a sign the agency is trying to stop work in that area.

Research on antibiotic-resistant bacteria might have made it to the list because of the attention Zahn was drawing from groups that wanted him to speak at public meetings. Perhaps a dozen times, Zahn said, his bosses in Ames and at regional and national headquarters forbade him from discussing his work in public or private meetings. However, Brian Kerr, Zahn's research director, said it was just a few times. Among the invitations Zahn had to turn down was at an Adair County, IA Board of Health meeting to discuss confinements. Zahn later found a fax trail showing that information about his planned appearance first passed from an environmental advocacy group to a Des Moines TV station, then to the Iowa Pork Producers Association (IPPA) office. Someone there sent the fax to the National Pork Producers Council (NPPC) in Zahn's building. A NPPC worker contacted Kerr to question the appearance, Zahn said. Kerr then called his superiors in Peoria, who decided Zahn could not speak at the meeting. The reason? The meeting was related to human health, which didn't fit the lab's "mission."

In an interview, Kerr said: "The main reason we elected not to speak at those meetings was we refocused on the mission of our unit. That mission did not include antibiotics or antibiotic resistance. Another reason is that the meetings would include speaking on human-health impacts. We do not do that." But a statement posted on the lab's Web site reads, in part: "The mission of the Swine Odor and Manure Management Research Unit is to solve critical problems in the swine production industry that impact production efficiency, environmental quality, and human health." The unit, according to its Web site, is also supposed to find confinement management techniques that reduce "nutrient excretion, production of odor, gaseous emissions, and release of pathogens into the environment."

Certainly, researchers studying pollution from farms don't face industry pressure universally. But no one tracks how often scientists paid by taxpayers are silenced or intimidated. Those brave enough to speak out usually have secure jobs at universities or, like Zahn, leave the public arena. In addition to not being able to publish his work, Zahn was uncomfortable that an "advisory panel" of hog farmers, assembled by the USDA, watched over the lab's work. In fact, national pork groups have at times had offices in the same government buildings as the USDA labs. "No other government agency ever had this hand-holding relationship with a livestock group," Zahn said after he quit the USDA job.

Hays said the nature of her agency - researching ways to improve agriculture - requires cooperation with farm groups. "Obviously, we pay attention" when the pork industry lays out an area that needs research. The government works closely with farm groups to do the research they need, she said, but it doesn't let them skew or suppress results. The commodity groups help frame research needed to protect the environment and to make farming more efficient. But the work is objective and independent, she added. Hays said advisory groups are common at many USDA labs

Economist Neil Harl at ISU said farmers are flexing their political muscle like never before in the arena of scientific research. "I see more pressure from external sources than I have seen in my 38 years at this school," he said. However, IPPA President Tim Bierman said he wasn't aware of any interference by his group. He did say, however, that public meetings sponsored by advocacy groups give him pause. "Some of these meetings are one-sided. You can get caught in the middle of something and try to present information correctly, and they will twist it and will use it against you," Bierman said. Zahn's bosses also worried aloud about his attendance at potentially controversial meetings. The agency doesn't want scientists at meetings where they may be pressured by groups with an agenda to say things that go beyond the research, statements that then find their way into policy debates, Hays said. "It isn't that it's controversial or that we don't like these people," she said. In contrast, another federal researcher, Dana Kolpin of the USGS's Iowa City office, was allowed to speak to the group twice.

Kendall Thu, a former University of Iowa researcher now at Northern Illinois University, has co-written a book on the shift to large-scale livestock confinement operations, and has studied the health of farm neighbors in Iowa and Illinois. He said Zahn's predicament is common. "His story is deeply disturbing and fits a pattern of industry intimidation, the muzzling of freedom of speech and erosion of academic freedom," Thu said. Thu extended one of the speaking invitations to Zahn, only to have it rejected by Zahn's supervisors. "I think there is no question that the pork producers short-circuited the process," Thu said. "What it says is USDA is subject to industry pressure and members of the public are not getting the independent research and presentation they need."

However, livestock groups say researchers' criticism is off base. Officials of state and national pork organizations say that they support objective research, as a policy and through research grants, and that they encourage producers to limit pollution. The National Pork Board (NPB), for instance, finances scientific studies with fees from hog farmers, said spokeswoman Cindy Cunningham. Details of the studies must be approved by USDA officials, a process that she considers proof of objectivity. The board does not try to avoid controversial issues, she said. It held a two-day Pork Quality and Safety Summit in Des Moines in June, which included presentations on controversial issues such as alternatives to feeding antibiotics to hogs.

The group this year offered up to $40,000 per project to scientists who would study the spread of pathogens from confinements and possible health effects. It also sought studies of alternatives to feeding hogs low levels of antibiotics, which is what causes medicine-fighting bacteria to grow in the animals and their manure. Any criticism that the pork board is trying to stifle objective research or skew the USDA-reviewed study plans "is just ludicrous," Cunningham said. Typically, the scientists suggest an experiment, and then the pork groups decide whether to finance part of the work. After that, they have no say in the research or how the results are used, she said. Bierman, a hog farmer himself, said his group wants to make sure the work is presented fairly and based on facts, not on an anti-industry bias. "As long as the research is done with sound science and done correctly, we're going to stand by it," he said.

Farm groups contend that they want balanced presentations in print and in public meetings and a chance to review the data that led to the researchers' findings. "There isn't a preconceived, 'Here's what we want to know,'" said Paula Chizek of the ICGA. "We do exercise our right to exercise our concern if we feel there is misinformation or inaccuracy or if something has been taken out of context. You'd better believe we'll look into it."

In the end, scientists, who typically initiate the studies, say industry pressure is stopping important work meant to protect the taxpayers, who foot most of the bill. Even when the work gets done, they worry about efforts to manipulate or muffle the results. For some, the bigger fear is that scientists will censor themselves to avoid angering the boss or losing a grant. Jeff Ruch of Public Employees for Environmental Responsibility, a nonprofit alliance of government workers interested in environmental protection, said federal workers have a First Amendment right to discuss their work with groups and individuals as long as the workers don't say their comments are the official stance of the agency. Even so, he said, those workers should think twice before they take advantage of their rights. Bosses, he said, can retaliate in subtle ways against employees who stand up to them. "Your career could be over," he said.

The ARS takes in money from farm groups and other private sources equal to about 9% of its $1 billion annual budget. In Zahn's case, for instance, pork producers paid up to one-third of the cost of some research. The bottom line is that people who have fought to stop construction of large-scale hog confinements are angered by what they see as the gagging of scientists.

Source: Perry Beeman, Des Moines Register, 12/1/02

Atrazine/Frog Deformity Controversy

New studies raise questions about whether atrazine, used primarily for killing weeds in cornfields, is acting as an endocrine disrupter in amphibians, interfering with normal hormonal functions, and causing males to become hermaphrodites, and producing eggs in their testes.

Some 60-70 million pounds of the herbicide are applied each year in the U.S., and it has been found in rivers, ponds, snowmelt and rainwater. Scientists have taken a particular interest in the new studies because such a widespread endocrine disrupter could help explain worldwide declines of amphibians. The studies could also affect continued use of atrazine. In fact the EPA is reviewing the herbicide's environmental risks as part of the periodic reregistration process required for continued sale of such chemicals. Much of the newest research was presented at a November meeting of the Society of Environmental Toxicology and Chemistry in Salt Lake City.

The controversy began in April when Dr. Tyrone Hayes, an endocrinologist at the University of California at Berkeley, and colleagues published results in the Proceedings of the National Academy of Sciences indicating that very low concentrations of atrazine, similar to those seen in the wild, could turn males of the African clawed frog into hermaphrodites in the laboratory. Then in the October issue of Nature, Dr. Hayes and colleagues published studies showing that males of the leopard frog, a native species, could also be feminized by exposure to low levels of atrazine in the laboratory. More worrisome, the researchers found that in the seven field sites from Utah to Iowa where they could detect atrazine, they also found hermaphroditic frogs, but at the one site without detectable atrazine, there were no hermaphrodites.

Dr. Hayes said he was surprised by the high levels of hermaphroditism caused by sometimes minute levels of atrazine, with sometimes as many as one-third of the males affected. The effects were less severe at higher levels of the herbicide. But while that might seem counterintuitive, Dr. Hayes said it was typical for chemicals affecting hormones to have highly different, even opposite effects at increased levels.

Meanwhile, two industry-sponsored studies, carried out by a team that has been critical of Dr. Hayes's work, have failed to replicate his findings with the clawed frog. The work was paid for by Syngenta, a maker of atrazine. The team also reported that it had examined wild-caught males of the clawed frog where it is native in Africa, and where atrazine is widely used, and found no hermaphrodites. "Validated information should be replicable," said Dr. Ronald Kendall, an environmental toxicologist at Texas Tech University, and a leader of the industry-sponsored team. Dr. Kendall also said his team's work had been wrongly impugned as biased because of its industry financing, and he pointed out that Dr. Hayes also formerly received Syngenta financing. However, Dr. Hayes said his original research showing that atrazine could create hermaphroditic frogs, though sponsored by Syngenta, was never published by them.

The April publication in which he replicated that research was sponsored by the National Science Foundation; the Nature study was paid for by the W. Alton Jones Foundation, which finances environmental work, and the conservation group World Wildlife Fund. It remains unclear why the studies conflict. Dr. Hayes, when interviewed, had seen only one of the Kendall team's unpublished studies. Based on the methods, Dr. Hayes said he was not surprised they had not replicated his results. He said that the researchers had raised the frogs under unhealthy conditions and that they did not properly control levels of atrazine in the

frogs' water. "Even if their animals were healthy, you can't compare them to our study," he said.

But Dr. Jim Carr, comparative endocrinologist at Texas Tech and a member of Dr. Kendall's team, said that in another study team members had mimicked Dr. Hayes's experimental conditions more closely but still did not reproduce his results. Dr. Carr and colleagues have also criticized Dr. Hayes's omission of certain experiments considered standard. "There are not a lot of details published in the Hayes work," said Dr. Carr. "So it's hard to compare."

Source: Carol Kaesuk Yoon, New York Times, 11/19/02

New Feedlot Pollution Rule

The Bush Administration on 12/16/02 announced new standards for the largest animal feedlots, calling for a reduction in water pollution, but allowing each farm to write its own plans and to keep them secret from the public. The new rule stems from a 1992 judicial consent decree between the EPA and the Natural Resources Defense Council which forced the EPA to finalize the new rule by 12/15/02.

Environmental groups complained that the new rule was far too vague and amounted to a step backward. For example, farmers need not list the name of their corporate backers on their permit, an omission environmentalists say will spare the large agribusinesses from liability for pollution problems. Also, there is no requirement that farmers use the latest technology for manure disposal, which is essentially a miniature on-site wastewater treatment plant. Instead farmers are allowed to continue using leak-prone "lagoons".

But EPA Administrator Christie Whitman and, Agriculture Secretary Ann M. Veneman told reporters that the rule would lead to a 25% reduction in the main pollutants created by manure and urine from swine, cattle and chickens confinements. "This is a major step forward to protect our nation's waters," Mrs. Whitman said. "Animal waste from confined animal feed operations pose a real threat to America's rivers and waters." Agriculture is the single greatest source of water pollution in the country. Nationwide, about 238,000 livestock operations generate 500 million tons of manure, according to the EPA.

Animal manure typically contains nutrients such as nitrogen and phosphorus, which can be beneficial as fertilizer in low to moderate amounts. But in large amounts, they are problematic. "The waste causes illness in people, pollutes the streams, kills fish, causes nuisance conditions and really drives up the price of groundwater because you have to treat it before you drink it," said Catherine Kuhlman, acting water division director for the EPA's western region. The manure also contains pathogens, salts and heavy metals like copper. "There are a whole lot of reasons why the average person should see (the new rule) as a real benefit," Kuhlman said.

Industry officials said the new regulations would draw thousands more swine, poultry and cattle farms into the EPA's regulatory process, but they expressed relief that they will not be held liable for the waste their animals produce. That liability concept is one that Maryland had led the nation in codifying, by requiring large poultry companies such as Tyson Foods Inc., Perdue Farms Inc. and Allen Foods Inc. to ensure the proper disposal of the manure created by the millions of birds they hire farmers to raise each year.

The new rule requires Concentrated Animal Feeding Operations (CAFOs) of at least 1,000 head of cattle, 700 dairy cows, 2,500 hogs, 10,000 sheep, 125,000 chickens, 30,000 broiler chickens, 82,000 laying hens or 55,000 turkeys to develop a plan to control pollution. The previous standards written 25 years ago allowed for many exceptions and applied to fewer than 5,000 operations. The new standards will apply to some 15,500 operations. Each plan must provide for proper manure storage, removal of dead animals and reduction of the amount of manure used to fertilize fields. Currently many of these operations spray so much manure on fields that the crops produced there are deemed unfit for animals or humans. Mrs. Whitman said the rule would reduce nitrogen released by these farms by 110 million pounds and phosphorus by 56 million pounds, or approximately 25% of current levels. That estimate is based on several years of study, she said.

The new rule also eliminates exemptions for CAFOs that discharge only during large storms and for poultry operations that raise chickens with dry manure handling systems; and it extends coverage to immature swine and dairy cows. Kuhlman said the changes will mean increased costs for some operations. "We tried to keep it focused on the biggest farms and livestock operations, believing they are best able to deal with the costs," she said. The EPA estimates the cost of implementing the program at $326 million for the livestock operators and $9 million for the government. Benefits to the public, the agency says, will be $204-355 million annually from cleaner drinking water, reduced fish kills and shellfish losses, and cleaner estuaries.

Ms. Veneman said the 2002 farm bill contained enough money to smooth the way for farmers to adhere to the new rule. But environmentalists disputed that characterization, too, saying the farm bill gave big agribusinesses federal subsidies to clean up the water pollution they created in their huge feedlots. Environmentalists also complained that the rule had no minimum standards and did not allow public review of plans for individual farms. The final rule puts polluters first," said Melanie Shepherdson, a lawyer for the Natural Resources Defense Council, which initiated the lawsuit that the group won and that required the new standard. "It's a sweet deal for factory farm polluters, but it stinks for the rest of us." Lawyers for her group said they are examining the new rule to challenge it in court.

Kuhlman said some environmental groups have also complained that the new rule doesn't require the cleaning up of groundwater. The agency, she said, thought it was best to leave that issue to the states' discretion. "We're thinking with this rule we'll get at 60% of the manure and wastewater in the nation," she said. "Our job is not done, but this is the most important step we could be taking right now."

Spokesmen for the hog, cattle and chicken industries said they were pleased with the announcement. Several industries said the new rule would have little effect on most of their farmers. We applaud the administration for its efforts to make this more palatable, however, we are still concerned about its cost and the impact it will have on the small and mid-size pork producers," said Kara Flynn, a spokeswoman for the National Pork Council.

Sen. Tom Harkin (D/IA) called the rule "a muddled result, without a clear path to a cleaner environment." He added: "Unfortunately, the EPA ducked its responsibility to hold large agribusiness firms responsible for environmental damage from manure." John Menke, an environmental specialist with the California Water Resources Control

Board, said the new rule may hurt efforts to crack down on polluters in his state's $4.6-billion dairy industry. California waste regulations already prohibit discharge from large animal operations. "All this means is that instead of staff out looking for violators they will be in the office drafting permits," he said. "It doesn't help us.... We don't need permits to take enforcement action."

The meat industry began building huge feedlots in isolated rural areas from North Carolina to California in the 1990's, capturing the waste of hogs and cattle in large manure lagoons and spraying them in nearby fields. The operations were not required to apply for permits or to follow procedures developed for disposing of most human waste, which includes breaking down waste matter and then chlorinating the waste before it is discharged back into rivers. More than 35,000 miles of rivers were polluted by the big feedlots in the past decade, according to the EPA.

Citizen groups have filed dozens of lawsuits to try to control or evict these feedlots from their counties. Residents contend that feedlots destroy the quality of pastoral life with their odor and threaten the environment and public health with noxious air pollution and seepage of polluted water into drinking and surface water. Few issues are more emotional in rural America today.

Source: Elizabeth Becker, New York Times, 12/17/02; Tom Avril, Philadelphia Inquirer, 12/17/02; Suzanne Herel, San Francisco Chronicle, 12/17/02; Eric Pianin and Anita Huslin, Washington Post, 12/17/02; and Elizabeth Shogren and Melinda Fulmer, Los Angeles Times, 12/17/02

Runoff Rules Upheld for Small Cities

A federal appeals court upheld rules on 1/14/03 requiring the nation's small cities and counties to protect waterways from storm water pollution, a major source of contamination. The U.S. Court of Appeals in San Francisco, which heard the nationwide case, also said the EPA must strengthen its rules by requiring public hearings and state review of local plans to make sure they work.

The EPA rules, adopted by the Clinton administration in 1999, apply to sewer systems operated by cities and counties with fewer than 100,000 people, and to runoff from construction sites of one to five acres. Rules for larger cities and construction sites, and for runoff from industrial sites, took effect in 1990. Small cities in populous counties were allowed to choose which set of rules applied to them. Now local governments must submit plans by March to reduce pollution caused by runoff from construction, development and local roads, and to educate the public on the ways that everyday activities like pesticide and fertilizer use affect storm water pollution.

"This is very good news for everyone who uses the waters, for surfers, for boaters and for fishers," said Nancy Stoner, a lawyer with the Natural Resources Defense Council. She said storm water is the largest source of pollution in U.S. coastal waters and the largest source of bacteria that cause beach closures. "There's a lot more small cities than large cities, so this will have a huge impact, particularly if they follow the rules and require pollutants to be reduced to the maximum extent practicable," Stoner said.

But a lawyer for municipal water agencies said the federal rules violate local governments' constitutional autonomy. By requiring municipalities to limit pollution from local developments and construction sites into sewer systems that empty into navigable waterways, "the EPA was telling us pretty much how we had to regulate," said Sydney Falk, who represented the Texas Counties Storm Water Coalition. He said his client may appeal.

The court ruled 2-1 that local governments were not being coerced into adopting federal regulations. The EPA rules give municipalities a choice, the court said: They can take specific steps to limit runoff, such as requiring construction companies to control erosion; or they can adopt their own measures, such as building and preserving wetlands, to keep local discharges out of rivers and oceans. Local agencies won't have to install expensive wastewater treatment equipment, but can adopt less expensive, low-tech solutions, such as phasing in development and requiring reseeding after development to limit erosion, said Stoner.

The court also rejected arguments by the National Association of Home Builders that runoff from small construction sites does not affect water quality enough to justify regulation. The only flaw the court found in the EPA rules was a provision allowing local agencies to decide for themselves whether their plans took all practical steps to reduce pollution. The federal Clean Water Act requires public hearings and state agency review of the plans, the court said.

Source: Bob Egelko, San Francisco Chronicle, 1/15/03

U.S. Wetlands Policy Redefined

The Bush Administration issued new guidelines on 12/27/02 to try to halt massive losses of the nation's wetlands to roads, housing and commercial development, and to quell criticism that previous proposals were far too lenient on developers. Under the new regulations and a 17-point National Wetlands Mitigation Action Plan developed by the administration, the underlying needs of a watershed will be given more emphasis than the conventional focus on any net loss of acreage, according to EPA spokesman Joe Martyak.

The new "watershed-based plan" focuses on the wetland needs of an entire watershed, rather than only the site of the development. For example, if a developer destroys 10 acres of wetlands, he can no longer just plant 10 acres of trees nearby. Instead, the Corps of Engineers (Corps) must advise the developer if other, more potentially valuable areas in the watershed need replenishing, even if the acreage does not match precisely what would be lost.

EPA and Corps officials said the multiyear strategy and a new guidance letter specifying steps developers may take to replace or restore destroyed wetlands will strengthen the government's efforts to hold the line against future net losses. Officials said the plan and regulations are designed to enhance technical capabilities for wetland restoration and protection, as well as to clarify policies to ensure "ecologically sound, predictable and enforceable" wetlands restoration within the context of protecting larger watersheds.

"It's an effort to look at the overall need within the watershed and go through a process to restore the functions and values of the types of wetlands that are being lost," said Ben Grumbles, assistant administrator for water at the EPA. Mark Sudol, chief of the Corps' regulatory branch, said this new, broader approach would likely result in the government demanding more replacement land, not less, in coming years, as officials learn more about the wetlands' ecological value. In 2002, the Corps generally required developers to provide more than

two acres of replacement wetlands for every acre destroyed. "The overall net effect of the use of functional assessment techniques (instead of simple acreage replacement) will result in a net gain in wetlands," Sudol predicted.

Wetlands, which include bogs, marshes and swamps, are essential to well-functioning ecosystems because they filter drinking water, retain flood waters, support a diverse array of wildlife and provide homes to fish and shellfish. Destroying wetlands can increase floods, cause stream pollution and result in the loss of valuable habitat. Tens of thousands of acres of wetlands across the country are lost to development each year.

The Clean Water Act prohibits developers, home builders and others from filling in wetlands unless the Corps grants a permit. In those cases, the permit holder must either restore the wetlands or create a replacement to compensate for damage done. The Corps triggered an outcry from other federal agencies, lawmakers and environmental groups in October 2001 when it released a draft of the guidance letter that appeared to abandon an ambitious goal of "no net loss" of wetlands that was set by President George H.W. Bush in 1989. Along with the EPA, the Agriculture (USDA), Commerce, Interior (DOI) and Transportation (DOT) departments reworked the guidelines in the face of criticism of the current Bush administration's policy.

The Association of State Wetland Managers hailed the new guidelines as a big improvement over previous proposals, while the National Association of Home Builders, facing a new set of regulations for building on wetlands, questioned the need for the changes. But environmentalists said that the new guidelines are not binding and that they gave too much leeway to developers. "They've left a lot of room for abuse," said Julie Sibbing of the National Wildlife Federation. "There isn't the technology to determine the trade-off in wetlands functions, so you don't know if what you're building will be successful or better than the wetland. This is a fancy way of couching the watershed approach, but it will result in losses." Sibbing described the new guidelines as "a marginal improvement over last year's" but warned that they would do little to stem the loss of valuable wetlands. "It seems to me they just haven't gotten the message yet that 80 percent of these wetlands restoration efforts are failures," she said. "They're just relying on the faith-based approach that this will all work out, when we've seen that it doesn't."

The seventeen points of the new Plan follow:

Clarifying Recent Mitigation Guidance

1) The Corps, in consultation with EPA, USDA, DOI, Federal Highway Administration (FHWA), and National Oceanic and Atmospheric Administration (NOAA), has reevaluated its mitigation Regulatory Guidance Letter and is reissuing it to clarify mitigation implementation provisions.

Integrating Compensatory Mitigation into a Watershed Context

2) The Corps and EPA, in conjunction with USDA, DOI, and NOAA, working with States and Tribes, will co-lead the development of guidance on the use of on-site vs off-site and in-kind vs out-of-kind compensatory mitigation by the end of 2003.

3) EPA and the Corps, in conjunction with USDA, DOI, and NOAA, working with States and Tribes, will co-lead the development of guidance on the use of vegetated buffers as a potential component of compensatory mitigation by 2004.

4) The Corps and EPA, in conjunction with USDA, DOI, and NOAA, working with States and Tribes, will develop guidance on the appropriate use of preservation for compensatory mitigation by 2004.

5) Building on the guidance above, EPA and the Corps, working with USDA, DOI, and NOAA, will co-lead an analysis with Tribes and States on the use of compensatory mitigation within a watershed context and identify criteria for making compensatory mitigation decisions in this context by 2005.

Improving Compensatory Mitigation Accountability

6) EPA, the Corps, and FHWA will develop guidance that clarifies implementation of the TEA-21 preference for mitigation banking in 2003.

7) EPA will continue to provide financial assistance through its wetlands State grants program to encourage Tribes, States, and others to increase the success of mitigation in their jurisdictions.

8) EPA and the Corps, in conjunction with USDA, DOI, and NOAA, will develop guidance by 2004 for protecting those wetlands for which mitigation, restoration, or creation is not feasible or scientifically viable.

9) EPA and the Corps, in conjunction with USDA, DOI, and NOAA, will clarify considerations for mitigating impacts to streams in the Section 404 program in 2003.

Clarifying Performance Standards

10) The Corps, EPA, USDA, DOI, and NOAA, working with States and Tribes, will develop a model mitigation plan checklist for permit applicants in 2003.

11) EPA and the Corps, in conjunction with USDA, DOI, and NOAA, will review and develop guidance adapting the National Academy of Science (NAS)-recommended guidelines for creating or restoring self-sustaining wetlands to the Section 404 program in 2003.

12) EPA will analyze existing research to determine the effectiveness of using biological indicators and functional assessments for evaluating mitigation performance in 2003.

13) Building upon the biological indicators and functional assessments research, EPA, in conjunction with the Corps, USDA, DOI, and NOAA, and working with States and Tribes, will lead the development of performance standards guidance on monitoring and adaptive management of mitigation sites by 2005.

14) EPA and the Corps, in conjunction with USDA, DOI, and NOAA, will clarify key concepts related to performance standards.

Improving Data Collection and Availability

15) The Corps, EPA, USDA, DOI, and NOAA, in conjunction with States and Tribes, will compile and disseminate information regarding existing mitigation-tracking data base systems in 2003.

16) Building upon the analysis of existing mitigation data base systems, the Corps, EPA, USDA, DOI, and NOAA will establish a shared mitigation database by 2005.

17) Utilizing the shared database, the Corps, in conjunction with EPA, USDA, DOI, and NOAA, will provide an annual public report card on compensatory mitigation to complement reporting of other wetlands programs by 2005.

A complete copy of the National Wetlands Mitigation Action Plan can be downloaded at: http://www.epa.gov/owow/wetlands/NWMAP122402signed.pdf

Sources: Eric Pianin, Washington Post, 12/28/02 and Katharine Q. Seelye, The New York Times, 12/27/02; and National Wetlands Mitigation Action Plan, 12/24/02

Court Upholds Authority to Regulate Plowing and Excavation

The Supreme Court on 12/16/02 by a vote of 4-4 upheld the federal government's authority to regulate farming, mining, excavation and other activities that alter or destroy wetlands without adding an outside pollutant. Justice Anthony Kennedy did not participate in the case due to a conflict of interest, and a tie automatically upholds a lower court's ruling. At issue in Borden Ranch v. Army Corps of Engineers was an allegation by California farmer Angelo Tsakopoulos that the EPA and Army Corps of Engineers acted outside their jurisdiction when they fined him nearly $9 million for using the "deep ripping" technique to plow wetlands on his property without a permit.

Tsakopoulos had argued that plowing the wetlands was legal because the mud and dirt ripped up by the plow's five to seven-foot blades do not fit the Clean Water Act (CWA) definition of "addition of a pollutant" to the wetland. And even if substances churned up within the water body can be considered added pollutants, deep ripping is legal because it falls under an exemption in the act for normal farming activities. But the district and appeals court, and now the Supreme Court have all found that mud, clay and rocks churned up within a waterway could indeed be considered pollutants. The courts also found that deep ripping does not fall under the normal farming exemption — in this case because Tsakopoulos used the technique to convert his land from rangeland to orchards and vineyards.

In upholding the lower court decision, the Supreme Court also upheld EPA's ability to issue a maximum fine of $25,000 for each pass Tsakopoulos made through the wetland with his plow. Tsakopoulos had argued the CWA mandate that penalties not "exceed $25,000 per day for each violation" meant the agency could not fine a violator more than $25,000 per day, even if several violations occurred on the same day.

Tsakopoulos bought the 8,348-acre ranch in 1993 for $8.3 million with the intent to convert parts of it to vineyards and orchards, uses for which deep ripping is necessary. The same year, the Corps claimed jurisdiction over swales and drainages as waters of the U.S., and informed Tsakopoulos he needed a permit before deep ripping those areas, which totalled about two acres. But in 1993, 1994, 1995 and 1996 Tsakopoulos deep ripped wetlands without a permit. By 1996, he had sold 4,036 acres of deep-ripped property for $16.2 million, according to court records. The same year, EPA filed a ruling that Tsakopoulos had violated the CWA, and the landowner then sued the federal agencies, saying they had overstepped their jurisdiction.

Environmentalists had feared the case would open the door to wholesale wetlands destruction. Tim Searchinger, Environmental Defense, said if the court had approved wetlands destruction that does not involve the addition of an outside pollutant, it would have legalized draining wetlands, the most common form of wetlands destruction. And if the court had allowed a wholesale exemption for agriculture, it would have legalized the most widespread activity for which wetlands are destroyed. "Most wetlands are destroyed to plant a crop," Searchinger said. "If you wanted to build a shopping center, all you'd have to do would be plant crops first, then put in your shopping center."

Source: Damon Franz, Greenwire, 12/17/02

U.S. Opens Online Portal to Rulemaking

The Bush Administration on 1/23/03 took the first step in expanding interest in electronic rulemaking to the entire government and populace by establishing the web site: www.regulations.gov. The goal of the site is to enable anyone with a computer and Internet access to find every federal regulation that is open for comment, read it and submit their views.

The electronic gateway only allows users to submit comments, users cannot see other people's comments or background information on proposed regulations. Still, "It's a step in the right direction," said Jeffrey S. Lubbers, visiting professor at the Washington & Lee University School of Law and expert in administrative law. "The interest groups already know how to do this. This will level the playing field."

More than 4,000 new rules a year are churned out by some 160 federal agencies implementing laws passed by Congress. They cover many controversial topics, from labeling organic food and safety standards in the workplace to the allowable amount of contaminants such as arsenic in the water supply. Historically, the rulemaking process has been dominated by special-interest groups that have the money and time to pay attention to the details of the proposals.

Neil R. Eisner, assistant general counsel at the Department of Transportation (DOT) said the new portal, with a simple searching mechanism, is designed to encourage more comments from outside the Capital Beltway. "This will definitely open it up to people who find it difficult to participate in the rulemaking process. People outside of Washington can do this on their own. They don't have to have a lot of money to get a document or pay money for people to do work for them," he said. The DOT found that public comments soared when electronic submissions became routine, rising from 3,102 in 1997 to 62,944 comments on 119 rules in 2000.

But researchers like Stuart W. Shulman, a professor at Drake University in Iowa who has been monitoring electronic rulemaking since the mid-1990s, said it will take more than a jump in numbers to measure whether the new system will fundamentally change the outcome of rules or the behavior of rulemakers, or, more broadly, democratize the regulatory process. In fact, he and others worry that the new government Web site will be used by experienced interest groups to flood agencies with their comments — an electronic version of sending thousands of postcards to Congress or the agencies on hot-button issues.

The National Association of Manufacturers (NAM) has already provided its members with an electronic template for commenting on key rules, officials said, including a Bush Administration proposal to reverse a Clinton-era rule to let states fund family leave with unemployment funds. "Our guys are very comfortable electronically and they will feel very comfortable filing comments this way," said Sandy Boyd, a NAM official. Harrison "Lee" Rainie, director of the Pew Internet and American Life Project, which found that millions of Americans already use the Internet to comment on proposed rules and policies, predicted that

"the lobbying and advocacy crowd" will benefit most from the expanded e-comment system because they are most involved in regulatory issues — and they get paid for their interest. "But, as a citizen in San Antonio, I have the same shot at this as a lawyer on K Street. It's not a utopian thing, but it will be an improvement." Gary D. Bass, executive director of OMB Watch, a group advocating open government, said the new system should benefit business groups in the short term because of their technological access. "It creates an opportunity for industry to pile on, but I hope in the long run it empowers the public to participate."

The Bush administration predicts that it will save money for taxpayers by creating a central electronic docket for the government, rather than one for each agency. The new site is expected to be able to handle at least 2,000 users at a time, or 16,000 comments per hour. Users will be able to select an agency and a regulation by keyword. The rules that have that keyword in them — say, clean air — then pop up on the screen so the viewer can read them. Or, a user can type "all" and see all the regulatory proposals that might be open across the entire federal government. The system provides a comment box where 4,000 characters can be entered, and it accepts electronic attachments. Once entered, comments will be shipped electronically to the agency involved in the rulemaking. The agency will then process it, sending it to its paper or electronic docket "room."

"The portal will let you find, view and comment on a rule in three clicks," said Mark A. Forman, the Office of Management and Budget's associate director on the project. "It's not a rocket science Web site. It's very simple." It's so simple that the initial version lacks features that might make it more useful to users. One would be to offer electronic notification of rules of interest to individual computer users. Others would like to see a system that lists the rules that receive the most comments, in the hopes of enticing readers to look further and comment. Those bells and whistles are expected to come later when the government-wide docket is developed. That initiative is being led by the EPA and a team of other agencies. The idea is to add agencies and their existing dockets to the EPA's site, which is considered state-of-the-art for government electronic-docket systems.

In the meantime, the wide assortment of docket systems that agencies now operate have to be standardized. That will be a big job because of the varying degrees of sophistication — and recalcitrance — at some, officials said. Most agencies still accept a combination of e-mail, faxes and the written word. Some smaller ones are still paper-only.

Source: Cindy Skrzycki, Washington Post, 1/23/03

Proposed Beluga Sturgeon Listing

The U.S. Fish and Wildlife Service (FWS) is proposing to list the beluga sturgeon, source of the world's best caviar, as an endangered species. Such action would cut off about 20% of legal caviar imports to the U.S., where about 80% of the world's beluga caviar is consumed. Last year, Americans imported 16 tons of the caviar, valued at more than $30 million, from Russia and other Caspian Sea nations. Caviar is the roe, or unfertilized eggs, of female sturgeon, lightly salted and packed in the fish's oils. Wildlife officials are expected to decide on the listing in early 2003.

"This is a species that has been around for over 150 million years," says Lisa Speer, fisheries conservation specialist with the Natural Resources Defense Council. "But unless we move quickly, it doesn't have a long-term future." Cold brackish water on the Russian side of the Caspian Sea is widely known for producing the best beluga caviar. The twice-yearly caviar harvest was closely regulated by the Soviet Union but has become erratic since that nation's collapse in 1991, U.S. officials say. The high retail price — sometimes more than $100 an ounce in the U.S. — has led to overfishing and extensive poaching.

In 1998, a group of 140 nations set quotas for the export of beluga and two other types of Caspian Sea caviar. Supporters of a caviar ban say the quotas have failed to halt the beluga's decline. They estimate that beluga stocks have fallen 90% in the past decade. Caviar importers say the quotas need more time to work. They say a ban on imports to the U.S. would not cut production because beluga caviar still would be sold elsewhere. A ban could create a large black market in the U.S., importers say.

Beluga-loving Americans "are not just going to go away," says Eve Vega, executive director of Petrossian Inc. in New York City, the firm founded by two brothers who made caviar popular in the 1920s. "A ban will make (smuggling) more attractive. There will be even more financial incentive (for poachers) to take what's left of the beluga." U.S. authorities have begun to crack down on the illegal caviar trade, and in the past three years, nine people have received prison sentences and officials have issued more than $11 million in fines. Offenses have ranged from trying to smuggle caviar past U.S. Customs agents to pasting counterfeit Russian caviar labels onto tins of paddlefish eggs taken from waters in Mississippi and Arkansas.

Richard Willing, USA Today, 12/2/02

Missouri River Water Wars

The water wars on the Missouri River grew more fierce and desperate in mid December as Montana's Fort Peck and North Dakota's Sakakawea lakes continued to be drained, and downriver interests announced they plan to sue to get even more flow downstream to float their barges.

Currently, under the U.S. Army Corps of Engineer's (Corps) flow schedules Fort Peck water releases will average 10,000 cfs in December and 11,000 cfs for January and February. With inflows generally running 4,000 to 5,000 cfs, outflows are running 200 to 250% of what's flowing in. Since 12/1/02, water levels on the 134-mile long reservoir have dropped to more than 30 feet below full pool elevation. At the current rate, Fort Peck will be lower than it's all-time low of by some time in February. The drain on Sakakawea has also continued, but water is being held back in South Dakota's Lake Oahe, presumably to be released later for the lower river's barges.

Montana Fish, Wildlife and Parks (FWP) biologist Mike Ruggles reported that cisco, the major food source for fish in Fort Peck, spawns in mid winter. With other forage species like perch and shiners already at, or near, record low levels, dropping water levels will leave many of the shallow-spawning cisco eggs high and dry or encased in ice, reducing next summers forage fish populations even more.

Meanwhile, the Coalition to Protect the Missouri River – a consortium of farm interests, barge operators and others on the lower Missouri – announced on 12/16/02 that it plans to sue the Corps in 60 days over manipulating flows to protect endangered

species. The Corps held back flows last July to avoid flooding the nests of the endangered least tern and threatened piping plover, two bird species that nest on river sand bars. The Corps also planned to raise spring flows in the future to help the endangered pallid sturgeon. The coalition called this "unproven science." The U.S. Fish and

Piping Plover

Wildlife Service (FWS) and fish and game agencies in North and South Dakota are also named in the suit, with the coalition charging that the Endangered Species Act (ESA) is being violated.

According to the coalition, "The management of upstream reservoirs to support non-native fish for economic support of sport fishing is illegal." Non-native species in Fort Peck, according to the coalition, would include walleyes, smallmouth bass, northern pike, chinook salmon and lake trout. Among the coalition's reasons for the suit is that there is no long-term reliability of flows on the lower Missouri to float barges and pleasure excursions. That, the coalition says, is costing them big dollars. In short, the coalition apparently wants its stretch of the Missouri to be drought-proof no matter what the whims of the weather, or the fact that Fort Peck water levels have been dropping steadily since 1997, or that Montana is completing its fourth-straight year of severe drought.

The coalition's planned lawsuit came after a 11/15/02 FWS letter to the Corps calling for an interruption in barge traffic during the summer, when the river's flow would be reduced to create sandbars, slow-moving water and the conditions needed by wildlife to thrive. Low flows "are not just about terns and plovers but are also important to pallid sturgeons and the ecological needs of the system," the letter says, responding to recent studies showing that least terns and piping plovers are making a minor comeback. The FWS called its letter a clarification. According to the FWS's Missouri River Biological Opinion (BiOp), the Corps must alter operations of six dams north of Gavin's Point Dam in South Dakota by 3/03, to restore river ecosystems and protect the three species.

The FWS letter rankled navigation interests, who contend that they lost $7 million in business last summer when lower water levels, ordered on a one-time basis to protect nesting birds, forced barges and excursion boats to remained docked. Because of the ESA, water levels on the river couldn't be raised last summer when the FWS blocked relocation of the bird's nests. The rise would have flooded about 270 eggs or chicks. Chris Brescia, president of Midwest Area River Coalition, an industry trade association in St. Louis, said the new assertions reaffirm his organization's plan to sue to force the FWS to back off. "What they are saying now is not a scientific decision but a political tactic intended to flex their muscles and cause us harm," he said. Richard Opper, executive director of the Missouri River Basin Association, which provides a forum for eight states to discuss river management, said, "The service (FWS) has, in effect thrown down the gauntlet and said enough is enough, it's time for change."

Meanwhile, the Corps has been stalling its decision on the issue, taking the unusual step last year of issuing an environmental impact statement without a preferred alternative. Last May the agency delayed its decision again, saying it would enter "informal consultation" with the FWS on how to minimize harm to the species. Then this fall, Corps and FWS officials agreed that the best course of action would be to maintain the status quo next year until the consultations are completed. This prompted a lawsuit threat from environmentalists, who say the agencies will be breaking the law if they do not conform to the BiOp next year. "The Army Corps is clinging to the status quo in defiance of the law, clear science, and sound economics," said David Hayes, former deputy Interior secretary and currently a partner at Latham & Watkins, which is representing American Rivers, the National Wildlife Federation and other groups in their suit.

Corps spokesman Paul Johnston said the FWS's latest opinions would be considered along with other comments about the Corps' river management plan for next year. He observed that when the Corps cut the flow last summer from Gavins Point Dam to protect nesting birds, "it shut down the navigation industry, caused anxiety from power plants and brought complaints from marina operators." But Chad Smith, Midwestern representative of American Rivers said the return of barges to the river this year disproved the industry's contention that one summer with low flows would put towboat operators out of business. "It may have been unplanned and untimely last summer, but the navigation industry survived," he said.

Walleyes Unlimited of Montana has mounted an e-mail campaign to the state's congressional delegation to try to intercede on the state's behalf with the Corps to alter the Ft. Peck flow plans. But so far, only Sen. Max Baucus has responded. Baucus released a statement on 12/17/02 saying, "I'm extremely concerned about the releases of water from Fort Peck and the impacts these releases could have on the local fisheries and the local economy. We've suffered through more than four years of drought in Montana, and Fort Peck Lake is nearing record lows. It looks like we'll have another dry year in 2003. It defies common sense to keep sending water from Fort Peck downstream, particularly to states that haven't been hit as hard by the drought as central and Eastern Montana."

But Sen. Kit Bond (R/MO) is pushing to have federal river managers move the nests of endangered birds next summer to avoid another costly halt to barge traffic. Environmental groups attacked Bond's proposal as "a death sentence" for the birds. Bond's proposal would tie the FWS's hands in the future. "The drought on the Missouri and Mississippi rivers is at a critical stage," Bond said. "Unless action is taken to conserve, precious water will be wasted and unavailable for both upstream and downstream priorities. With low water and a shaky economy – and the Mississippi River about to close down – this limited measure makes common sense," Bond said.

Environmental groups said the effect of Bond's language would be to grant the Missouri River an unprecedented exemption from the ESA. The endangered and threatened birds and their nests would be moved from sandbars to captive rearing facilities. "Moving these struggling birds to a brick building is a death sentence," said Smith. Scott Faber, spokesman for the group Environmental Defense, warned that with Bond's amendment, "these species will creep closer to extinction and dozens of additional species will need federal protection."

Least Tern

Peter Carrels, a writer from Aberdeen, SD, who has written extensively on Missouri River conflicts speaking at a meeting in Columbia, MO explained, from a personal perspective, some of the ideological differences of the various competing Missouri River factions. "In my part of the world", Carrels said, "people love the Missouri River, even though much of the river...isn't really a river anymore — it's basically a river impounded." "But in my part of the world, people love the river. They speak of it fondly; they call it 'The River.' And on weekends through the summer, through all the warm months of the year, people flock to the river and the reservoirs."

In contrast, Carrels said, people in the Lower Basin don't go to the river very often and are less interested in using the river for recreation than preserving the barge industry that transports 1.5 million tons of cargo per year. Compared to the Mississippi River's 200 to 300 million tons, Carrels said this number is insignificant and frustrates many Upper Basin residents who have to deal with lower reservoir levels and negative impacts on wildlife and recreation.

"People in this part of the world (the Lower Basin) can't appreciate the anger of walleye fisherman when they don't have a reference point for it," Carrels said. "There's a different relationship to the river in my part of the world than there is here." Despite this traditional division, Carrels thinks more Lower Basin residents are having an ideological change of mind. The future conflict, he said, will be between recreation and industry irrespective of geographic location. "It's not so much Upper versus Lower anymore, because there are a growing number of people in the Lower Basin who want more from their river than just a trench," Carrels said. "I think eventually it's going to be recreation, wildlife, quality of life versus industrial river."

Source: Mark Henckel, Billings Gazette, 12/19/02; AP/Billings Gazette, 1/23/03; Bill Lambrecht, St. Louis Post-Dispatch, 12/4/02; Henry J. Cordes, Omaha World-Herald, 1/23/03; Damon Franz, Greenwire, 12/19/02; and Tam Jones, Columbia Missourian, 12/13/02

Plans to Dam Wild and Scenic River Tributary Abandoned

The Army Corps of Engineers (Corps) has revoked a permit for construction of a dam on a tributary of the Buffalo National River in Arkansas. The dam was the subject of a lawsuit by environmentalists and recreationists who said the Corps illegally issued the permit before the National Park Service (NPS) could determine the dam's impacts on the Buffalo River, one of the few remaining unpolluted, free-flowing rivers in the lower 48 states.

Seven environmental and recreation groups challenged the Corps permit last year, charging that the Bear Creek Dam would disrupt flows and water quality in the 135-mile Buffalo National River, which hosts over 300 species of fish, insects, freshwater mussels and aquatic plants. Congress designated the Buffalo as a national river in 1972, with legislation nearly identical to that in the National Wild and Scenic Rivers Act.

There is no hearing scheduled for this case, said Jack Hannon, general counsel for American Rivers. But the plaintiffs still want a federal judge to rule on the existing legal issue of whether the permit was issued illegally, in order to establish a legal precedent that they hope will determine which agency has jurisdiction over the tributaries of protected rivers like the Buffalo. The environmentalists want the federal agency in charge of the protected portion of the river — in this case NPS — to have the authority to determine whether a project on a tributary would impact the conserved area. "The Corps' assertion that you can protect a river without protecting its headwaters is nonsensical," added Don Barger of the National Parks Conservation Association.

Source: Dan Berman, Land Letter, 12/19/02

Fish Passage Video

Viewers can now get a fish-eye view of what happens when fish enter screens installed at the U.S. Bureau of Reclamation's (USBOR) "A Canal" in the Klamath River, Oregon. The two-minute video shows each step a fish will take, from the opening of the canal through a bypass pipe and eventually to the Link River. The racks will keep adult fish and debris out of the canal, but allow juveniles to pass through. Fish will be guided to the center of the passage by a V-shaped screen in the form of a long, narrow ramped channel.

From there fish will enter a bypass pipe leading either to a fish evaluation station, or directly to the Link River below the Link River Dam. Biologists in the fish evaluation station can "check the effectiveness of the screen system, as well as evaluate overall health of the fish population," according to the video narrative. From the fish station, fish will enter a pipe routed underground and underwater that opens at the opposite shoreline of Klamath Lake.

The new fish screens and headgates, being constructed at a cost of $13 million and scheduled for completion in April, will prevent fish, including endangered Lost River and shortnose suckers, from being trapped in the canal that carries irrigation water to about 180,000 acres of farmland in the Klamath Reclamation Project.

Construction of the headgate and screens was required under a biological opinion issued by the U.S. Fish and Wildlife Service for operation of the Klamath Project.

The animated video is available on CD, and can be viewed on the Internet at http://www.mp.usbr.gov/kbao/fish_screen/animation/klamath2.html. You can also go to the USBOR web site www.mp.usbr.gov/kbao/, click on "Latest Headlines" and "A Canal Fish Screen Construction Information" to view the video.

Matt Hall, Klamath Falls Herald and News, 12/12/02 and Greenwire, 12/16/02

River Restoration and Inflatable Tubes

Damming a stream might seem like a strange way to revive it. But that is the premise behind a proposal to bring back the natural beauty of the Los Angeles River. The idea floated by a local artist, has caught the eye of, Ed Reyes, a City Councilman who is heading a committee looking at ways to revitalize the concrete-lined river. Reyes is intrigued by the idea of installing giant inflatable rubber dams at two ends of downtown to create an artificial lake that could serve as a centerpiece for urban renewal. It's nothing more than a dream at this point, but it is increasingly being discussed as a serious possibility. Such a project would cost millions, but Reyes argues that its value as a recreational asset and magnet for redevelopment would far outweigh the cost. He envisions the lake as a water gateway of sorts that would unite urban neighborhoods now separated by rail yards and warehouses, enticing boaters to row beneath downtown's elegant arched bridges while taking in impressive views of the skyline.

Its boundaries, he theorized, could run from the confluence of the Los Angeles River and the Arroyo Seco near Cypress Park to just past downtown's historic 6th Street bridge. "The river has the potential to be a tool to address some of the problems in this city," Reyes said. "I am not saying this is a cure-all, but this is a step in the right direction. "The plan is welcomed by some Los Angeles River activists, who say they are glad to finally see city leaders thinking bigger about their blighted waterway after decades of neglect. Others are wary, saying it reflects a simplistic vision of river revival that they fear could lead to little more than a new tourist trap next to a fake lake. Lane Baren, the artist who conjured up the idea believes his plan would solve the most fundamental problem facing proponents of river restoration: getting the public to see the graffiti-stained concrete channel as a real river. That, he said, is the first step Los Angeles must take if part of the river's straitjacket is ever to be removed and its natural appearance restored, as many environmentalists hope.

A similar idea has already been brought to life in Tempe, AZ where city leaders have used an intricate system of rubber dams to build their own lakeside district. The 220-acre Tempe Town Lake, completed in 1999, turned the Salt River, a dry desert wash next to the city's downtown, into a water attraction that drew two million visitors last year. Kris Baxter, city spokeswoman said, people rented boats, fished for freshly stocked trout and took in classical music concerts along its shore. A large rowing regatta is planned for this winter. The river bottom was not a pleasant place before, she said. Homeless encampments developed, people dumped stolen cars there --It was a real eyesore, and now it has become something that is really beautiful.

Tempe Town Lake also serves as a massive flood-control project in an area that had been ravaged by storms. Plans are under-way for a performing arts center and marina. Baxter estimated the city's overall investment at $100 million, but said the basic improvements cost far less: about $35 million. The lake is contained by a massive inflatable dam system consisting of four 240-foot, 40-ton rubber tubes on each end, fixed to a concrete base. The dams can be deflated in 45 minutes to prevent flooding in the event of a major rainstorm. There are 2,200 such inflatable dams in use around the world. Tempe officials said, most of the inflatable dams are made by Japan's Bridgestone Corp. In fact, some smaller inflatable dams are already being used to divert storm water in Los Angeles County.

The heavily commercial San Antonio River Walk, one of Texas' top tourist attractions, is another river project being studied by city leaders as a possible model for how to convert the Los Angeles River. "There are so many other possibilities. I think what Denver has accomplished" on the South Platte River "is a much more interesting example to explore," said Melanie Winter of the River Project, a Los Angeles environ-mental group. Through a series of public and private partnerships, the South Platte River area has been revitalized with a cleanup of the formerly polluted waterway through the city's downtown and a massive redevelopment program crowned by the construction of Coors Field, the Colorado Rockies' ballpark. The LoDo area, as Denver's lower downtown is now known, is home to art galleries, brew pubs and luxury apartments and is among the city's trendiest spots.

"It's a question of priorities," Winter said. "Any project that the city considers on the Los Angeles River needs to be held up first and foremost to a standard of multiple objectives. We're trying to improve water quality and water supply, increase habitat and create recreational and economic benefits for communities while maintaining flood protection.

Source: Miguel Bustillo, Los Angeles Times, 1/24/03

U.S. and Water Use Efficiency

The U.S. is the most inefficient water user of all 147 countries, according to a report released on 12/11/02 by the World Water Council (WWC), a group that ranks countries according to water resources, access, capacity, use and environmental impact. Despite its inefficiency, however, the U.S. ranked 32nd in the overall index, which will be discussed in March at the World Water Forum in Japan. "The U.S. is at a relatively low position because of wasteful or inefficient water use practices in domestic, industry and agriculture," said William Cosgrove of the WWC. "This is illustrated by the fact that per capita water consumption is the highest in the world."

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The United Nations is preparing to launch the International Year of Freshwater and will call on governments and businesses to improve access to drinking water and sanitation. "Water is likely to become a growing source of tension and fierce competition between nations if present trends continue, but it can also be a catalyst for cooperation," said Kofi Annan, the U.N. secretary-general. World leaders will meet in Kyoto in March to address the U.N.'s commitment to halve the proportion of people without water and sanitation by 2015.

The Water Poverty Index said Finland, followed by Canada, leads the world in favorable water situations. The 10 worst countries are all in the developing world and include Ethiopia, Chad, Rwanda and Burundi. Although Canada ranked second overall, Cosgrove, a Canadian, said improvements can be made. In Europe, "they treat the water better before they put it back, they recycle it, they use less and use clean technology in their manufacturing systems," he said. "Those are the types of things that we're going to have to start to do in that part of Canada and eventually we should learn it in the whole country," he said referring to the Canadian provinces that pull water from the Great Lakes basin.

Sources: Sue Leeman, AP/Boston Globe, 12/12/02; Vannessa Houlder, Financial Times, 12/12/02; Anne-Marie Tobin, Toronto Star, 12/11/02; and Greenwire, 12/12/02

Global Warming Found to Displace Species

Global warming is forcing species around the world to move into new ranges or alter habits in ways that could disrupt ecosystems, two groups of researchers say. The two new studies, by teams at the University of Texas, Wesleyan, Stanford and elsewhere, are reported in the 1/2/03 issue of the journal Nature. Experts not associated with the studies say they provide the clearest portrait yet of a biological world driven into accelerating flux by warming caused at least in part by human activity.

The authors of one of the papers, Dr. Camille Parmesan, a biologist at the University of Texas, and Dr. Gary Yohe, an economist at Wesleyan University, calculated that many ecological changes measured in recent decades had a 95% chance of being a result of climate warming and not some other factor. Parmesan and Yohe reviewed studies that tracked about 1,700 species over several decades. A statistical analysis of 99 species of birds, butterflies and alpine herbs in North America and Europe showed that the range of territory has shifted northward an average of 3.8 miles per decade, or to higher altitudes by an average of about 20 feet per decade. In an examination of 172 other species of plants, migratory birds, amphibians and other animals, breeding and blooming events were occurring an average of two days per decade earlier.

"We tried to get away from criticism that we're cherry-picking or only focusing on studies that show dramatic changes," said Parmesan. "We focused on multispecies studies and found that 50% of the species aren't changing. But of the 50% that are changing, 84% of those changes can be linked to regional climate change patterns." Regions now considered stable may no longer be that way in 50 to 100 years, Parmesan said. Plants and animals have always had to adjust to shifting climates. But climate is changing faster now than in recent millenniums, and many scientists attribute the pace to rising concentrations of heat-trapping greenhouse gases. The result in coming decades could be substantial ecological disruption, local losses of wildlife and extinction of some species, the two studies said.

Dr. Richard P. Alley, an expert on past climate change at Pennsylvania State University as well as Chairman of the National Research Council's Committee on Abrupt Climate Change, said that climate had changed more abruptly a few times since the last ice age and that nature had shifted in response. But, he noted, "the preindustrial migrations were made without having to worry about cornfields, parking lots and Interstates." Citing the new work and studies of past climate shifts, Dr. Alley saw particular significance in the expectation that animals and plants that rely on one another were likely to migrate at different rates. Referring to affected species, he said, "You'll have to change what you eat, or rely on fewer things to eat, or travel farther to eat, all of which have costs."

Authors of both new papers said they were concerned that such significant ecological changes were being detected, even though global temperatures had risen only about one degree in the last century. They noted that projections of global warming by 2100 ranged from 2.5 to 10 degrees above current levels, should concentrations of carbon dioxide and other heat-trapping gases, which flow mainly from smokestacks and tailpipes, continue to rise.

By comparison, the world took some 18,000 years to climb out of the depths of the last ice age and warm some five to nine degrees to current conditions. "If we're already seeing such dramatic changes" among species, "it's really pretty frightening to think what we might see in the next 100 years," said Dr. Terry L. Root, an ecologist at Stanford University who was the lead author of one of the new studies. Both teams found, with very high certainty, a clear ecological effect of rising temperatures. Several of the researchers said the effects of other, simultaneous human actions, like urban expansion and the introduction of invasive species, could greatly amplify the effects of climate change. Dr. Alley said the studies illustrated the importance of conducting much more research to anticipate impending harms and devise ways to maintain biological diversity, for instance with green "wildlife corridors" linking adjacent pockets of habitat.

But while some scientists have been warning that the Earth is slowly heating up, others say, that it could take a sudden turn toward the frigid - and stay that way for decades, if not centuries. In the Northeast, subzero temperatures could become standard winter fare, filling rivers with ice chunks, cutting short the growing season, and altering bird migrations. Behind that brutal scenario is a baffling ocean phenomenon that experts have watched with rising angst: an expanding mass of freshwater in the usually salty North Atlantic that has spread alarmingly in the last seven years. It now reaches south from Greenland to just off the coast of the Carolinas, an area of 15 million square miles.

If the buildup continues, they say, it could impede the Gulf Stream, a major climate-maker that transports warm air to northern latitudes in winter. Were that critical current to be slowed by the freshwater, let alone stopped, average winter temperatures in the Northeastern U.S. and in Western Europe could abruptly plummet 10 degrees — a change not experienced by anyone alive today. A five-degree drop would be in store for the rest of the States. Exactly when it might occur, scientists generally are loath to speculate. "None of us could tell you whether that event happens next year or 100 years from now," said Raymond W. Schmitt Jr., senior scientist at the Woods Hole Oceanographic Institution in Massachusetts, which has taken the lead in studying the freshwater pool. John Gagosian, head of Woods Hole, in a recent paper said, "In just the past year, we have seen ominous signs that we may be headed toward a potentially dangerous threshold." "If we cross it, Earth's climate could switch gears and jump very rapidly — not gradually — into a completely different mode of operation."

One climate scientist suspects the Gulf Stream already is slowing down. At a time when other glaciers around the world are in retreat, the Scandinavian glacier has been growing. Andrew Weaver, of the University of Victoria, British Columbia, says it may be the result of less warm air reaching that far corner of the North Atlantic. The prospect of a deep freeze, whether sooner or later, so concerns the British government that it is sinking $30 million into figuring out what's going on because while no one disputes the freshening is real, no one is sure why it is happening. Some researchers believe that, ironically, global warming could be to blame, that melting Greenland glaciers and Arctic Sea ice could be diluting

the salt water of the North Atlantic. Others theorize it could be a phase in a natural cycle, one that ice-core evidence suggests might have happened several times in the last 100,000 years — and perhaps as recently as America's colonial era.

Oceans are turbulent, chaotic places, and their circulation is at least as complex as the atmosphere's. The Gulf Stream, which originates in the Caribbean, is no exception. Oceanographers typically describe it as part of a "conveyor belt," because in order to keep the current moving, the cold, salty water in the North Atlantic must sink beneath it. That creates a void that is filled by the rush of more Gulf Stream water. And so it moves north-northeast toward Iceland at about 5 mph, warming the overlying atmosphere for more than 2,000 miles. The heated air moderates the frigid blasts out of Canada before they can reach London, Paris or Rome. Without the Gulf Stream, London would feel like Montreal, but gloomier. Fresher water is a threat to the conveyor because it is lighter and sinks so slowly that the Gulf Stream could sputter and even stop. "If you don't sink that [cold] water and move it into the south, there's no reason for the Gulf Stream to move the warm water to the north," said James Wright, a Rutgers University paleoceanographer. The current "would turn toward Portugal and go to the Canary Islands."

Conveyor-belt disruptions and sudden climate changes are nothing new - only the realization that they have occurred, says Penn State's Dr. Alley. Conventional wisdom used to hold that climate change, like aging, happened gradually. "Large, abrupt and widespread climate changes occurred repeatedly in the past across most of the Earth, and many followed closely after freshening of the North Atlantic," Alley said. Changes in the Gulf Stream is suspect in the onset of the so-called, Little Ice Age, which began in the 15th century and ended about 1850. That coincided with Gen. George Washington's encampment at Valley Forge during the fatally frigid winter of 1777-78; the winter of 1779-80 was even worse. It also encompassed the era of Washington Irving and frosty images of skaters on the lower Hudson in December. No one skates there these days.

In yet another study, global warming scientists reported in an early December issue of the journal Science that the effects of increased levels of carbon dioxide on plants can differ according to other elements present in the environment. Previous studies had found that increased levels of carbon dioxide, a component of global warming, cause plants to grow more abundantly. The new study differs because it looks at effects of all the climate change elements instead of a single factor, said Rebecca Shaw, the report's lead author.

Researchers grew plants with different combinations of the four major climate change elements — carbon dioxide higher temperatures, nitrogen and increased precipitation. Shaw said carbon dioxide alone caused about an 8% increase in plant production, but combined with other elements production dropped. When researchers added higher temperatures, nitrogen, water and carbon dioxideto the plants, production decreased by 40%. "This was unexpected," Shaw said. "We think that by applying all four elements in combination in a realistic situation, some other nutrient becomes a limiting factor to growth"

Sources: Andrew C. Revkin, New York Times, 1/2/03; Paul Recer, Charlotte Observer, 12/5/02; Anthony R. Wood, Philadelphia Inquirer, 12/8/02; and Julie Deardorff, Chicago Tribune, 1/2/03

Meetings of Interest

March 16-19: 2003 Freshwater Molllusk Conservation Society Symposium: Connections...A focus on habitat conservation. Durham, NC. See http://elipse.inhs.uiuc.edu/FMCS/Symposium. Contact: John Alderman, (919) 542-5331, aldermjm@mindspring.com.

March 23-27: The Future of Aquatic Ecosystems. Zurich, Switzerland. Organized by the Foundation for Environmental Conservation and Swiss Federal Institute of Environmental Science & Technology (EAWAG). See http://www.icef.eawag.ch. Contact: icef@eawag.ch

March 23-29: Advanced Fish Medicine. Orlando and Gainesville, FL. See www.conferenceifas.ufl.edu/fishmed/. Contact: Shelby Tatlock, mktatlock@mail.ifas.ufl.edu.

April 22-25: 16th Annual National Conference on enhancing the states' lake management programs: Developing and implementing total maximum daily loads for lakes and reservoirs. Chicago, IL. Contact: bkirschn@chicagobotanic.org.

April 28-30: Innovations in species conservation: Integrative approaches to address rarity and risk. Portland, OR. See http://outreach.cof.orst.edu/speices/, Contact: (541) 737-2329, outreach@for.orst.edu.

May 13-15: USEPA: Using Science to Assess Environmental Vulnerabilities. King of Prussia, PA. See www.reva-maia.org. Contact: (781) 544-0423, conference@tpmc.com.

June 1-4: 7th Annual Missouri River Natural Resources Conference. Benedictine College, Atchison, KS. Contact: Jeanne Heuser, (573) 876-1876, jeanne_heuser@usgs.gov

July 6-11: Ninth International Conference on River Research and Applications. New South Wales, Australia. See http//:www.conlog.com.au/NISORS. Contact: Ms. Elizabeth Medley, conference@conlog.com.au or A/Professor Martin Thoms, thoms@scides.canberra.edu.au

June 8-11: Eighth National Watershed Conference - Exploring Working Watersheds: Changes Since Lewis & Clark. Harrah's Council Bluffs Casino & Hotel, Council Bluffs, IA. Contact: Tammy Sawatzky, (405) 521-4823 or NWCTammy@aol.com See: www.watershedcoalition.org

June 9-12: 12th International Conference on Aquatic Invasive Species. Ontario Ministry of Natural Resources, Windsor, Canada. Contact: Elizabeth Muckle-Jeffs, (800) 868-8776 or profedge@renc.igs.net. Also visit: http://www.aquatic-invasive-species-conference.org

Aug 10-14: 133rd Annual Meeting of the American Fisheries Society. Quebec City, Quebec, Canada. Contact: Betsy Fritz, bfritz@fisheries.org, (301)897-8616 x212

Aug 21-22: Maritime Environmental Engineering Technical Symposium 2003. Arlington, VA. Contact David Breslin, BreslinDA@navsea.navy.mil

Oct. 22-25: 21st Wakefield Fisheries Symposium: Assessment and Management of New and Developed Fisheries in Data-Limited Situations. Anchorage, AK. See www.uaf.edu/seagrant/. Contact fycon@uaf.edu, (907) 474-6701

May 2-6, 2004: AFS, 4th World Fisheries Congress - Reconciling Fisheries with Conservation: The Challenge of Managing Aquatic Ecosystems. Vancouver, BC. See www.worldfisheries2004org. Contact fish2004@advance-group.com, (800) 555-1099.

Aug 21-26, 2004: 134th Annual Meeting of the American Fisheries Society. Madison, WI. Contact: Betsy Fritz, bfritz@fisheries.org, (301) 897-8616

Congressional Action Pertinent to the Mississippi River Basin

FWPCA Amendments:

S. 170. Clean Water Infrastructure Financing Act of 2003. Voinovich (R/OH) and H.R. 20. Kelly (/NY) and Tauscher (D/CA). To amend the Federal Water Pollution Control Act (FWPCA) to authorize appropriations for State water pollution control revolving funds, and for other purposes.

Floodplain Management

H.R. 253. Two Floods and You Are Out of the Taxpayers' Pocket Act of 2003. Bereuter (R/NE) and Blumenauer (D/OR). To amend the National Flood Insurance Act of 1968 to reduce losses to properties for which repetitive flood insurance claim payments have been made.

Forestry

S. 32. Kyl (R/AZ) and 4 Cosponsors. To establish Institutes for research on the prevention of, and restoration from, wildfires in forest and woodland ecosystems of the interior West.

Global Warming

S. 17. Daschle (D/SD) and 15 Cosponsors. To initiate responsible federal actions that will reduce global warming and climate change risks to the economy, the environment, and the quality of life and for other purposes.

S. 139. Lieberman (D/CT) and McCain (R/AZ). To provide for scientific research on abrupt climate change, accelerate reduction of U.S. greenhouse gas emissions by establishing a market-driven system of greenhouse gas tradeable allowances to be used interchangeably with passenger vehicle fuel economy standard credits, limit U.S. greenhouse gas emissions, and reduce dependence on foreign oil, and ensure benefits to consumers from the trading in such allowances.

Invasive Species

S. 144. Craig (R/ID) and 9 Cosponsors and H.R. 119. Hefley (R/CO). To require the Interior Secretary to establish a program to provide assistance through the States to eligible weed management entities to control or eradicate harmful, nonnative weeds on public and private land.

H.R. 266. Ehlers (R/MI) and Gilchrest (R/MD). To establish the National Invasive Species Council, and for other purposes.

H.R. 273. Gilchrest (R/MD) and Tauzin (R/LA). To provide for the eradication and control of nutria in Maryland and Louisiana.

Mining

S. 44. Feingold (D/WI) and Cantwell (D/WA). To amend the Internal Revenue Code of 1986 to repeal the percentage depletion allowance for certain hardrock mines, and for other purposes.

Water Resources

H.R. 30. Bereuter (R/NE). To amend the Water Resources Development Act of 1992 to authorize the Secretary of the Army to pay the non-Federal share for managing recreation facilities and natural resources to water resource development projects if the non-Federal interest has agreed to reimburse the Secretary, and for other purposes.

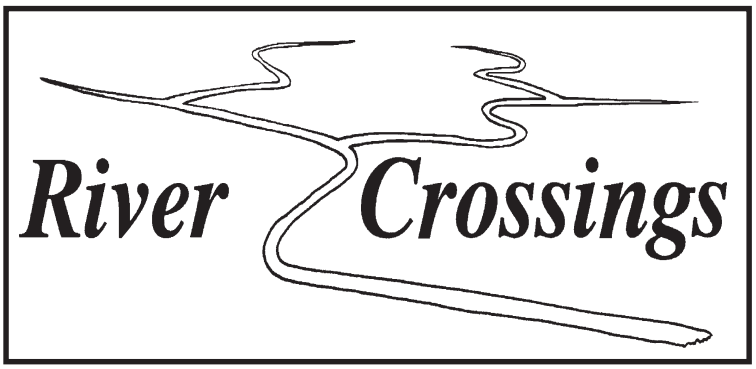
Source: U.S. Congress On Line

River Crossings

Mississippi Interstate Cooperative Resource Association
P.O. Box 774
Bettendorf, IA 52722

ADDRESS SERVICE REQUESTED

2003 Reader's Survey



Dear River Crossings Readers:

Thank you for your past interest in River Crossings, and most of all for your support in promoting the conservation and preservation of the Mississippi River Basin's great rivers. Without your continuing support and help in furthering the interests of aquatic resource management and conservation on the Nation's interjurisdictional rivers (i.e. those that border on or pass between two or more states or management jurisdictions), our work would be impossible. In our continuing effort to provide you with a quality newsletter, we ask that you fill out this survey and provide us with your thoughts on what we are doing well, what we could do better, and what we should be doing, but currently aren't. Also, please let us know if you wish to remain on our mailing list. We are constantly striving to conserve resources and cut costs, so your assistance is greatly appreciated. Reader's Survey Forms should be mailed to MICRA, P.O. Box 774, Bettendorf, IA 52722.

Sincerely,

Norman P. Stucky
Chairman

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