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### **Interjurisdictional Rivers Bill Update**

Congress ended their 1992 session without taking further action on H.R. 4169, cited as the "Cooperative Interjurisdictional Rivers Fisheries Resources Act of 1992." The Bill was introduced by Congressman Steve Gunderson (R/WI).

No new sponsors were signed on since the July-August "River Crossings" update. Congress will not return to session now until after the first of the year, so the earliest the Bill could be considered now is February.

For those unfamiliar with the Bill, it would provide test funding (\$2 million annually) for MICRA for a 3 year period.

The bill will have to be reintroduced for the next Session and will need the renewed support of constituents and co-signers. This will require a concerted effort on the part of all MICRA members and supporters.

Parties interested in reintroducing and/or co-sponsoring a new bill should

contact Congressman Steve Gunderson's Chief of Staff, Brad Cameron, Washington, D.C. (202) 225-5506.

### **MICRA Funding**

The U.S. Fish and Wildlife Service has supported MICRA for about a year and a half now through funding of the Coordinator's salary, expenses and office space. In 1991 this was thanks to Gary Edwards, Deputy Director for Fisheries in the Service's Washington Office, and in 1992 thanks go to John Christian, Assistant Regional Director (Region 3), and Hannibal Bolton, Deputy Assistant Regional Director (Region 3).

Through establishment of a Treasurer's position and a MICRA account we now have a mechanism in place to receive and use funding from various other sources. Marion Conover, Chief of Fisheries for the Iowa Department of Natural Resources has assumed the role of Treasurer and has established a bank account for MICRA in the Des Moines, Iowa area.

We received our first funding from the States in the form of \$1,500 in dues from

the State of Illinois. Thanks for the initiative on this go to Mike Conlin, Chief of Fisheries for the Illinois Department of Conservation. Thanks also go to the Tennessee Valley Authority and Herb Jones for providing a \$5,000 cash contribution to MICRA.

### **MICRA Paddlefish/Sturgeon Committee Meets in Rapid City**

MICRA's first standing technical committee has been formed to address basinwide concerns related to paddlefish and sturgeon.



Kim Graham, Missouri Department of Conservation, was elected by the membership to serve as their first Chairman. Other members include Steve Filipek (AR), Larry Hesse (NE), Veronica Pitman (TX), Bobby Reed (LA), Phil Stewart (MT), Cliff Stone (SD), Tom Mosher (KS), and Tom Gengerke (IA).



The Committee will operate under consensus whenever possible, but will revert to majority voting procedures when necessary. In the latter case, provisions were made for statement of minority opinion.



The Committee will develop a planning document early-on to guide their activities. However, before such a plan could be considered the Committee faced their first action item. This was prompted by a request from Mark Dryer, Leader of the Pallid Sturgeon Recovery Team. Dryer asked that MICRA consider and make recommendations on various stocking options for release of pallid sturgeon fingerlings produced this year under the Recovery Team's experimental pallid sturgeon spawning efforts.

These efforts were headed by Jerry Hamilton and Kim Graham, Missouri Department of Conservation, who successfully produced some 22,000 pallid sturgeon fingerlings (5+ inches long) at the Blind Pony Hatchery near Sweet Springs, MO. This number was reduced to about 10,000 when the fish were transferred to outside rearing ponds where bird predation became a factor.

Based on current growth rates these fingerlings should be about 10-12 inches long by November 1992, when plans are tentatively being made for their release to the wild. Before this release is made, however, genetics evaluations will be completed to make sure that they are, indeed, purebred pallid sturgeon and not a pallid/shovelnose sturgeon hybrid.

Apparently, a significant amount of hybridization is occurring in wild stocks of the Middle and Lower Mississippi River, and there is some concern that some of the adults spawned could be hybrids. Externally, the hybrid is difficult to tell from the real thing.

The Pallid Sturgeon Recovery Team agreed early on not to stock hatchery reared pallid sturgeon until genetic analyses of parental stock and of the wild populations was completed. These results are expected in October or early November. Genetic Analyses, Inc. of Smithville, TX is conducting the evaluations.

Mark Dryer, Recovery Team Leader requested that Missouri develop a stocking plan for the fish. Kim Graham responded with two different proposals: (1) Stock all of the sturgeon currently on hand in the Mississippi River below St. Louis, (2) Stock half in the lower Mississippi River and half in Missouri Department of Conservation managed lakes. These were described in greater detail in the July-August issue of "River Crossings".

After considering the two options the MICRA Paddlefish/Sturgeon Committee developed and recommended a third option. Genetics evaluation would still be required under the MICRA option. However, only fifty to two-hundred pallid sturgeon would be stocked into 2-3 small reservoirs in order to maintain a captive stock. Receiving reservoirs would support as high a benthos population as possible, with little opportunity for the fish to escape during high water. These fish would provide a source of known-age pallid sturgeon, if needed, for use in scientific studies at some future date or as a source for aquariums or other needs. All remaining fish would be released into the lower 100 miles of the Missouri River and the 200 mile Mississippi River reach bordering Missouri (St. Louis to Caruthersville).

## *River Crossings*

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



The entire length of the receiving reach would be 400 miles. If possible, all released fish would be tagged with a coded wire tag. If that is not possible, 10% would be tagged with a PIT tag, and all fish would be tagged externally. Follow-up monitoring would be provided by Missouri, Illinois, and Fish and Wildlife Service biologists.

Committee members nearly reached consensus on this recommendation, but Nebraska abstained from the vote. Larry Hesse (Nebraska) argued against any stocking of pallid sturgeon at this time. He said that "genetic swamping" is a real concern, and that the use of hatcheries to recover the species is the wrong way to go. The only real answer he said is through habitat improvement. He said we need to adopt planning that goes at the root cause of our problem. However, he does support Missouri's efforts to raise the fish because he says that gives us the opportunity to use the technique when needed.

By stocking these fish he said we are introducing weaker fish that haven't been subjected to natural selection, and that these weaker fish will be more likely to reach spawning age and actually spawn than they would have had they been left to the elements at a younger age. He said that hatchery reared fish are basically "unfit", and he would like to see the States back off on paddlefish stocking for the same reasons. He said that by stocking we are missing the opportunity to put the heat on development agencies to do the habitat work needed to protect these species.

The Committee's recommendation was forwarded to the Steering Committee and it's Policy Review Sub-Committee for further evaluation.

Additional information can be obtained from the MICRA Office or by contacting Kim Graham, Missouri Department of Conservation, Columbia, MO 65201, (314) 882-9880.

## Habitat and System Function Restoration vs Stocking

Larry Hesse, Nebraska Game and Parks Commission biologist, developed a position statement entitled, "Habitat and System Function Restoration" for consideration by the Paddlefish/Sturgeon Committee at their September Organizational meeting to support his arguments against stocking hatchery reared pallid sturgeon at this time.

This position statement forms the basis for his concerns regarding stocking vs habitat restoration, and we thought it worth printing, in part, (both paraphrased and quoted) for this edition of "River Crossings".

Hesse reports that for 30 years his State has conducted studies all along Nebraska's 383 mile reach of the Missouri River, and has documented wild breeding populations of paddlefish, shovelnose sturgeon, blue sucker,



flathead chub, and many other species throughout these reaches. Both large and old pallid sturgeon, as well as small (25 inches eye to fork length, weighing 3.9 lbs.) individuals have been collected. He reports that he has also successfully documented larval paddlefish, sturgeon, and blue sucker among many other species.



He has acquired a significant amount of information regarding physical conditions within the river during spawning periods, as well as at all times of the year. He says he has clearly demonstrated relationships between the density of life stages for native fishes and the operation of the river hydrograph as it is managed

by the Corps of Engineers throughout the Nebraska reach.

Plans which he is recommending for the Nebraska reach "...call for habitat, water management, sediment, temperature, and migration pattern restoration." Hesse says, "I do not support the use of hatchery fish, at this time, to restore native stocks, even though I have been involved with such stockings in the past. Recently reported evidence clearly demonstrates the concern associated with stocking hatchery fish into wild populations...". To support his position, Hesse cites examples involving stocking in the Great Lakes and salmon stocking efforts in the northwest.

Concerns raised in his statement include competition for food and other resources between wild and artificial fish, predation of artificial fish on wild fish, and genetic dilution of wild stocks. Of most concern, however, is that hatcheries and artificial production provide an excuse for habitat loss and poor fisheries management.

He says that "...the community of users come to believe that hatcheries can solve our serious fisheries problems, and are swayed from helping achieve habitat restoration, which takes political will."

"While we wait for hatchery stocks to restore wild stocks, habitat restoration is either put on hold, or scaled way back. But the history of hatchery stocking success clearly shows that in most cases we await only failure."

Hesse says his research shows that artificially stocked walleye, northern pike and blue catfish fry experience very high mortality rates in the wild. But, "If fish are held, at much greater expense, to nearly a year of age, the early life natural culling process is lost entirely and fish are stocked with a much higher rate of survival. These 'genetically unfit' hatchery products will mate with and eventually dilute the wild genetics which evolved under

the intensity of natural selection."

Hesse's position statement promotes the "First, do no harm" rule. That is, "Introductions should not be undertaken unless there is adequate assurance that wild stocks of fish and other species will not be harmed."



Hesse says that we do not have enough factual information to assure the "First do no harm" rule at this time. He feels "... we should adopt a strong recommendation to restore riverine habitat diversity, riverine hydrographs, sediment equilibria, organic matter supplies and transport, natural water temperature regimes, and fish bypass at dams. No more hatchery stockings should be made into wild riverine fish stocks until our committee takes the necessary time to develop the appropriate rationale for when hatchery fish can be used safely".

In the short term, Hesse would "... support the use of hatchery paddlefish and sturgeon only in portions of their range where they have been extirpated and there is small likelihood of escapement as adults. Should these fish develop natural reproduction capability, their progeny will undergo natural selection pressures and are thus less likely to deteriorate wild populations should they drift as larvae into open riverine reaches."

Paddlefish/Sturgeon Committee Chairman, Kim Graham asked Jeff Koppelman, Missouri Department of Conservation geneticist to evaluate Hesse's concerns. In a memo to

Graham, Koppelman agrees with Hesse in denouncing hatchery fish, but he does not consider the pallid sturgeon produced by Missouri this year as hatchery fish. He says, "...they are wild fish."

Koppelman says that "wild" fish are "hatchery" fish only, "...when the adults have been selectively bred (for some characteristic), or they have been in a hatchery for more than one year and have been spawned two consecutive years, or if their offspring are used as brood stock. I do not consider the two females and four males bred this year to be hatchery fish. But I will if they are bred next year."

He says Hesse's concerns that stocking will harm the recipient population can be alleviated by using "...as many adults as possible and you return the young to the same area. Next year, spawn a different brood stock and likewise return the young."

Koppelman says that natural selection in a hatchery can influence the genome of recipient populations, but he does "...not see the threat upon the native population to be as likely to occur..." as Hesse does. Koppelman says that, "Even if the young were maladapted because they were sheltered from natural selection during the most vulnerable stages of their life history, and they interbred with the native population...", there would be little effect, "...because the young from such crosses would now be selected against, if what they were sheltered from in the hatchery was selection for or against inherited characteristics. I emphasize the random aspect of survival because at this stage in pallid sturgeon evolution, I think that the remaining gene pool is so highly adapted that the selectional pressures on inherited characteristics causing pallid sturgeon problems, including diminished reproductive success, and survival of any zygote is likely more influenced by chance than some super set of adapted gene complexes."

Koppelman agrees with Hesse "...that environmental degradation and

mitigation via hatchery fish are the real problems...I do not think that restoration is likely to occur by stocking; stocking fish obviously is only a means to an end, a means that is not likely to succeed because it is not alleviating the problem."

Koppelman does not see any logical reason why the pallid sturgeon being raised by Missouri should not be stocked. "In this case, stock the fish since we have them and the stocking will not violate the 'no harm' rule."

The Paddlefish/Sturgeon Committee will obviously want to address the need for habitat restoration for this, and other large riverine species. Most biologists would likely agree that habitat restoration is the key to the future of these species. The Committee currently has no plans to support any future releases of pallid sturgeon.

Comments on this issue can be directed to the Coordinator or to Kim Graham, Chairman of MICRA's Paddlefish/ Sturgeon Committee, 1110 S. College Avenue, Columbia, MO 65201 (314) 882-9880.

## "Wild Fish"

The Oregon office of the Wilderness Society recently began publishing a bi-monthly newsletter called "Wild Fish". Its purpose is to provide up-to-date information about the status of the wild fish at risk in Idaho, Oregon, Washington, and California.

According to the Society's Quarterly Magazine (Fall 1992), "The newsletter is important for those interested in the fate of once-abundant fish populations and their habitat, which are now in serious trouble. The far-reaching and diverse consequences of the depleted fish populations include the probable extinction of a number of fish stocks, the destruction of gene pools, the erosion of tribal societies that have relied on wild fish for thousands of years, and the loss of jobs and income



in local communities."

The newsletter reports on the latest activities of individuals, organizations, and state and federal agencies and legislatures that are involved in fish-related issues.

Anyone interested in being added to the mailing list should contact Deanne Kloepfer or Valerie Kitchen, The Wilderness Society, 610 SW Alder, Suite 915, Portland, OR 97205-3610; (503) 248-0452.

### Pallid Sturgeon Recovery Plan Available

The Draft Pallid Sturgeon Recovery Plan has been circulated for public review and comment. All comments should be received by the Recovery Team by October 27th.



A total of 21 pallid sturgeon were reported captured by fishermen and fishery field crews between April 15 and August 15, 1992.

For more details or to obtain a copy of the plan contact Mark Dryer, Recovery Team Leader (701) 250-4491.

### Aquatic Habitat Classification

Habitat Classification is an issue which the Upper Mississippi River Conservation Committee and many other river biologists have wrestled with for many years. A good, mutually agreed to habitat classification scheme is essential in describing the river, in communications; in documenting change over time; and more recently, in adapting riverine biology to the techniques of remote sensing and Geographic Information Systems (GIS).

Development of an aquatic habitat

classification scheme was one of the first tasks addressed by the Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System for inventory, monitoring, impact assessment, research, and management purposes.

Within the floodplain of the Upper Mississippi River System aquatic areas can be defined that correspond to geomorphic and constructed features of that system. The hierarchical habitat classification scheme proposed by the LTRMP is displayed in Table 1.

Classified aquatic areas are useful as strata for randomized sampling of aquatic organisms. Mapping units of aquatic areas can be delineated that remain spatially fixed (until river and floodplain geometry changes). These aquatic areas cannot be considered specific habitat types, however, because they contain a wide range of dynamic conditions within each category and mapping unit.



Habitat conditions in running water, a second level descriptor, can be defined using water temperature, dissolved gases, dissolved solids, suspended solids, current velocity, turbulence, depth, substrate, and habitat types within the aquatic areas. Categories proposed by the LTRMP are displayed in Table 2.

Aquatic habitat in the Upper Mississippi River is a dynamic mosaic of habitat types. The extent and spatial distribution of specific habitat types vary greatly with river discharge. For example, aquatic habitat with a depth of 1 to 2 m, sand substrate, and current velocity of 0 to 0.3 m/sec is quite extensive at lower levels of river discharge in channels of the river. This

specific habitat type, selected by many lotic fish species, becomes restricted in areal extent at higher river discharges.

**Table 1. A proposed aquatic habitat classification scheme for the Upper Mississippi River System.**

Aquatic Areas	
<b>Channel</b>	
<i>Main Channel</i>	
Navigation channel	
Channel border	
Natural bank steep	
Natural bank gradual	
Revetted bank	
Wing dam	
Closing dam	
Sandbar	
Tailwater	
<i>Secondary channel</i>	
Navigation channel	
Channel border	
Natural bank steep	
Natural bank gradual	
Revetted bank	
Wing dam	
Closing dam	
Sandbar	
<i>Tertiary channel</i>	
<i>Tributary channel</i>	
<i>Excavated channel</i>	
<b>Backwater</b>	
<i>Contiguous</i>	
Floodplain lakes	
Abandoned channel lakes	
Tributary delta lakes	
Lateral levee lakes	
Scour channel lakes	
Floodplain depression lakes	
Borrow pit lakes	
Other artificial lakes	
Floodplain shallow aquatic	
Impounded	
<i>Isolated</i>	
Floodplain lakes	
Abandoned channel lakes	
Tributary delta lakes	
Lateral levee lakes	
Scour channel lakes	
Floodplain depression lakes	
Borrow pit lakes	
Other artificial lakes	
Floodplain shallow aquatic	

**Table 2. Habitat conditions used for defining specific aquatic habitat types within aquatic areas.**

Depth
Current
Velocity
Turbulence
Temperature
Dissolved oxygen concentration
Suspended solids concentration
Light
Substrate
Rock
Gravel
Sand
Silt/clay
Consolidated
(low water content)
Unconsolidated
(high water content)
Organic
Coarse refractory
Fine detrital
Cover
Submersed aquatic vegetation
Emergent aquatic vegetation
Floating aquatic vegetation
Flooded terrestrial vegetation
Grasses/sedges
Brush
Forest
Overhanging trees
Woody debris
Overhanging bank
Rock
Built structures

Maps of the spatial distribution of habitat conditions can be used to assess availability and suitability of habitat for aquatic organisms. For large rivers with dynamic habitat conditions, this effort requires use of a computer-assisted GIS, remote sensing, advanced surveying, and hydraulic modeling technologies. All these techniques are being used by the LTRMP.

Further information on the LTRMP habitat classification scheme can be obtained by contacting Dr. Ken Lubinski or Dan Wilcox, Environmental Management Technical Center, U.S. Fish & Wildlife Service, 575 Lester Avenue, Onalaska, WI

54650, (608) 783-7550. Comments and criticism are welcome.

Information on remote sensing and GIS applications for evaluation of riverine habitats and fisheries can be obtained from Mark Lastrup, also at the Environmental Management Technical Center, (608) 783-7550.

We at MICRA would like to hear from you on the applicability of the LTRMP classification scheme to other rivers, and if you have a different classification scheme you're using for your river we'd like to see a copy. Please send these and any comments you may have to the MICRA Coordinator's office, 608 E. Cherry, Columbia, MO 65203.

Standardization of riverine habitat classification is something MICRA will undoubtedly want to address in the coming months.

### The Corps of Engineers' New Environmental Ethic

Colonel Gaylerd E. Davis, Deputy Commander of the Missouri River Corps of Engineers Division in Omaha presented a talk on this subject on behalf of Lieutenant General Arthur E. Williams, Chief of Engineers at the recent River Restoration Symposium held in conjunction with the Annual meeting of the American Fisheries Society in Rapid City, SD.

Colonel Davis summarized the Corps' role over the years as "putting its many skills to work in meeting the needs of our country." In the early 19th century he said the Corps was, "...actively engaged in nation building thru exploration and surveying in the west; road, railway and lighthouse construction. On the rivers we were removing logs and bars to maintain navigation."

He said that over the years the Corps' mission has changed, "...to provide the engineering expertise necessary to meet the needs of a rapidly changing society."



"In the period between the mid '30's and the mid '60's the Corps met the needs of the nation by building flood control, water supply, and hydropower projects; and improving navigation and harbors. Unfortunately during this period the environmental impacts of this work was not a dominate issue."

But that has changed he said, "As a result of this new public environmental awakening the Corps has now embraced a **New Environmental Ethic.**" He said the Corps is actively meeting with environmental groups and working toward "sustainable development".

"Sustainable development", he says, "means growth that meets present economic needs without compromising our natural resources or the ability of future generations to meet their needs."



"To translate the new environmental ethic into practice", he says, "The Corps has adopted a **New Environmental Strategy** to elevate the importance of the environment."



He said, "The environment is no longer simply 'a consideration' in planning our new projects; it is now a 'go/no go' test. Any proposed new development or action will be judged by what we call the **Three E's**; Engineering, Economics, and Environment. Environmental considerations now stand--shoulder to shoulder--equal partners--with engineering and economics."

"New developments or actions, he said, attempt first, to avoid adverse impacts. If these are not avoidable, every effort is then made to minimize them and finally any unavoidable adverse impacts are fully mitigated. This guidance of 'Avoidance First'..., applies not only to the way we plan federal water resources projects, but also to the way we evaluate permit applications under the Section 404 regulatory program."

"The President and Congress", he said, "have established environmental protection as one of the **Primary Missions** for the Corps of Engineers Civil Works Program. This adds for us a **Legislative Mandate**, along with our ethical mandate, to make environmental protection/restoration an integral part of our support to the nation."

Colonel Davis cited several directives of the Water Resource Development Acts which gives the Corps direction in the water resources area. These include:

- Benefit-cost analyses count the value of environmental benefits, which are usually intangible, at least equal to cost.
- Mitigation plans are required as part of each project proposal, and mitigation must take place before or during construction.
- The Corps is authorized to retrofit environmental improvements at its existing projects, especially those built before the "Environmental ERA".
- The Corps is directed to develop in

consultation with the EPA, the Fish and Wildlife Service, and others a wetlands action plan to meet the national goal of "no net loss" of wetlands and to increase the long term quality and quantity of the nations's wetlands.

- The Corps is authorized to do "environmental dredging" for removal of contaminated sediments even if not within an authorized navigation channel normally dredged.

Colonel Davis cited the Corps' efforts on: (1) the Upper Mississippi River Environmental Management Program, (2) review of the Missouri River master manual, and (3) the Missouri River mitigation project as recent Corp's environmental successes in the Mississippi River Basin.

In closing, Colonel Davis said, "All of us share a common obligation of educating the public about the importance of environmental sustainable development for our nation's economic and social viability. Among other considerations, we must help citizens understand that we've entered a new global era...one in which respect for the environment. ..sustainable growth...is not only possible, but also critical for our survival."

Colonel Davis quoted Henry Ford, a quote which we can all put to good use in MICRA as well as in our daily lives, "Coming together is a beginning, keeping together is progress, working together is success."

Let's hope the Corps (all the way up and down the line) is and will remain committed to the new environmental ethic. If they are we applaud them, and we welcome the new era!



## U.S. Natural Resources Account

According to Jay D. Hair, President of the National Wildlife Federation and columnist with the Newspaper Enterprise Association, natural resources may soon be dealt with as part of the nation's capital assets, similar to the Gross National Product (GNP).

Hair says that Carol Carson, Director of the U.S. Bureau of Economic Analysis has plans to release the first natural resource account produced in the United States. It will be directly linked to GNP, but will be prepared as a separate, "satellite account" for fossil fuel resources. By the following year, a forest resources account is to be prepared.

Hair says, "This is a modest but necessary beginning. Understanding the real state of our economy requires that we account for the value of natural resources." We couldn't agree more!

## Reenactment of the Lewis and Clark Journey Ends

The two men Tom Warren, Tulsa chiropractor, and John Hilton, a Flat River, MO college administrator, finished their reenactment of Lewis and Clark's journey on August 13th at a press conference in Portland, OR.

An Associated Press article (Kansas City Star) said the men found the nation's river system in far worse shape than they expected when they set out on the 4,000 mile journey.

"We came into this with our eyes open, but we did not know the scope," Warren said. "The rivers remind me of an epitaph on a tombstone", Hilton said. "It said, I told you I was sick."

The men said they found the rivers drowned by dams, dried up by irrigation and fouled by agricultural and industrial pollution.



## Niangua Darter Update

Population surveys at 34 sites on 19 streams have been completed by the Missouri Department of Conservation in the last 12 months. Fewer darters occupying fewer miles of stream indicate that something must be done soon.

The Department of Conservation is educating landowners about ways to maintain healthy streams and is cooperating with the U.S. Army Corps of Engineers and county commissioners to improve gravel removal practices and



They set out on their journey at St. Louis on June 1.

## Hurricane Andrew Fish Kill

According to an article in "The Aquaculture News" (September 1992), millions of dead fish turned up following Hurricane Andrew and more kills were expected.

Low oxygen levels were blamed for the deaths of millions of fish in the Atchafalaya Basin and other inland waterways.

The kills were reported in saltwater and freshwater areas in south central Louisiana. At least 7 million fish died in a saltwater kill that occurred right after Andrew went ashore.

The hardest hit freshwater area appears to be in the Atchafalaya Basin. Kills were also reported in Lake Verret, near Manchac, and on Bayou Laforche.

The storm churned up bottom sediments that consumed oxygen and blew leaves and other vegetation into the water which also consumed oxygen as they deteriorated, making the situation worse.

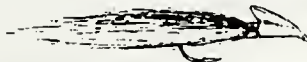
More kills were expected.

minimize other instream disturbances where darters live. They are also working with private landowners to improve stream habitat and establish forested buffer strips along Ozark streams. The Department is conducting this through their "Streams for the Future" program and, in part, through a U.S. Fish & Wildlife Service grant.

The Streams for the Future program involves technical assistance with cost sharing. A landowner can apply for reimbursement for one or more eligible practices and is provided technical assistance on the stream improvement project.

Eligible practices include riparian tree and shrub planting, livestock exclusion, natural riparian revegetation, streambank revegetation, tree revetments, riffle structures, anchored rootwad fish habitat structures, and riprap.

Source: Conservation Program Progress, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.



## National Fish and Wildlife Refuge, National Fish Refuge, or National Fish Management Unit?

Region 3 of the U.S. Fish and Wildlife Service is in the very early stages of developing proposals for establishing National Fish & Wildlife Refuges on the Middle Mississippi (between St. Louis and the mouth of the Ohio



River), and the Lower Missouri River (downstream from Sioux City, IA to the mouth at St. Louis).

The primary purpose of these refuges would be to stem the tide of declining habitat quality for large riverine fish species. In other words, action would be taken to better manage or gain management control of the remaining side channel and backwater habitat and to re-establish these habitats in areas where they formerly existed.

These refuges would be established over a long period of time through long-term leases and/or by obtaining land in fee title from willing sellers.

However, questions have been raised by some State fish managers who are concerned over the likelihood that, if these refuges are managed under the Fish and Wildlife Service's traditional refuge management program, they would ultimately end up being managed for waterfowl instead of fisheries, and that they would likely be closed to fishing.

Traditional waterfowl management in riverine



wetlands has isolated many of these refuge areas from the river, eliminating free fish movement to and from traditional spawning areas, and has



established water level management regimes which do not coincide with the needs of riverine fish species.

To guard against this possibility, some fishery biologists have suggested that instead of naming the new refuges "National Fish and Wildlife Refuges" that it would be better to name them "National Fish Refuges", or better yet under a new term which would more likely guarantee their availability to fishing for non-threatened species. Some have suggested calling them "National Fishery Management Units".

We'd like to know what others in the Basin think. We know of National Fish Refuges in the West where the desert pupfish is protected, and we know of the Upper Mississippi River Wildlife and Fish Refuge where waterfowl is the target of management. In the case of the Upper Mississippi, fish have taken the back seat in refuge management, and have often been negatively impacted by waterfowl management projects even though a major impetus for establishing this refuge was for protecting fish spawning grounds.



Please forward any insights, ideas, or views you may have on this subject to the MICRA Coordinator's Office, 608 East Cherry, Columbia, MO 65203.

### Arkansas Focusing on Streams and Rivers

After years of primarily concentrating on reservoirs, the Arkansas Game and Fish Commission has begun re-emphasizing the conservation and management of its valuable stream systems in its overall agency direction. Competing uses and development of these lotic systems and their riparian corridors have been manifested in a new state water plan where instream flow needs for fish and wildlife have often taken a back seat to agriculture and industry. To address these issues,



new ways of looking at fisheries instream flow reservation and basic aquatic surveying techniques have been developed.

A comprehensive stream survey system has been developed cooperatively by Arkansas and the U.S. Forest Service fisheries and hydrology personnel. Similar data are collected (biological, chemical, and physical) that answer the needs of both agencies and are incorporated into a data base. This system is called Basin Area Sampling System (BASS) and has been used on both headwaters and lower reaches of streams.

Using BASS, stream surveys are now being conducted in each of Arkansas' 11 fisheries districts by district management and research personnel. These survey/studies include: a tailwater trout habitat evaluation in the Beaver Lake tailwater; a restrictive size and creel limit (14-in and two fish/day) on a quality northern Arkansas smallmouth stream (Crooked Creek); evaluation of



longnose darter habitat and populations in northern and western Arkansas and sampling of possible candidate introduction streams; an evaluation of three dams on a Ouachita Mountain smallmouth bass stream; an environmental project below a Corps of Engineers' reservoir, cooperatively

funded by the Corps' and the State; a basin-wide look at what can be done to improve a heavily impacted stream by a multi-disciplinary team from several states, federal, and university groups (Lower Ouachita River Work Group); an aerial survey to identify potential lands for CRP enrollment on a low-gradient bottomland hardwood delta stream; and a continuing evaluation of the commercial and sport fishery values of one of the last major unregulated streams in the State, the Saline River.

In addition, to help maintain the riparian areas along Arkansas' streams and to provide angler and sportsman access, Arkansas has one of the most extensive systems of access in the nation (122 areas). Many of these areas are traditional boat ramps and parking areas, but there are also stream frontage and walk-in areas on several streams.

With over 10,000 miles of fishable streams, Arkansas has its work cut out trying to manage a diversity of stream resources ranging from hydropower trout streams to low gradient delta rivers. Arkansas is committed, however, to a long-term monitoring and management program that will protect an enviable and invaluable resource -- our streams.

More information on Arkansas' program can be obtained from: Steve Filipek, Fisheries Research Biologist, Arkansas Game and Fish Commission, #2 Natural Resources Drive, Little Rock, AR 72205, (801) 223-6300.

Source: SFI Bulletin No. 437, August 1992, and American Fisheries Society, Fisheries Management Section Newsletter Vol. 12, No. 1 (Spring 1992).

### Innovative Partnership Protects Beaver-Created Wetlands

The U.S. Fish & Wildlife Service, the Maine Department of Inland Fisheries and Wildlife, and private landowners



(Ron Joseph, Fish and Wildlife Enhancement, Maine Field Office)

180, Jefferson City, MO 65102, (314)751-4115.

### Ozark Hellbender Concerns

### Zebra Mussel Update

have launched a program designed to combat flooding caused by "nuisance" beaver dams, while protecting valuable beaver-created wetlands. The partnership is funded by the North American Waterfowl Management Plan.

Beavers have built many of their dams in Maine in highway culverts, causing rising water levels that often flood public roadways. The highway department has responded by trapping and relocating beaver and destroying the dams in order to lower water levels.

An alternative being used by the partnership involves a combination of PVC drainage pipes, turkey wire, and metal stakes. Biologists from the Maine Fisheries Department and the Fish and Wildlife Service are installing beaver exclosures around culverts. The beaver rebuild dams against the exclosures, but water levels can be controlled by the PVC pipes.

Since the partnership began in the spring, exclosures have been installed at eight sites, with successful results. A special example is found in central Maine where less than \$100 worth of hardware was installed to protect a 400-acre beaver-created wetland!

Private landowners are pleased, beaver ponds are not drained, the highway department rests easier knowing roads will not be flooded, and resource managers are pleased.

More than 500 acres of beaver-created wetlands have been protected to date.

Source: Fish and Wildlife News, U.S. Fish & Wildlife Service, Summer, 1992

Ozark Hellbenders are members of the giant salamander family. Although dwarfed by their Asiatic relatives that grow up to 5 ft. long, they are huge by North American standards. Missouri has produced specimens up to 2 ft. long and the Allegheny Mountain region has produced specimens measuring 29.6 in.

Their skin is a dark, mottled gray to brown and has pronounced folds along the sides of the body. Their tails are flattened and rudder-like. Once you've seen one you will never forget it, but the problem is that not many are being seen, and the species has become a candidate for federal listing.

Hellbenders live under flat rocks in swift, clear streams. Their diet of crayfish, minnows and other small animals sometimes gets them in trouble, because they are prone to nibbling at earthworms or other bait at the end of angler's lines.

Although hellbenders are harmless, Dennis Figg, Missouri Department of Conservation Endangered Species Coordinator, says that their appearance is so strange and unappetizing that some anglers kill them in disgust.

Recent declines in Arkansas have raised concern for the species, and a survey is presently being conducted in Missouri. Figg says, "We haven't taken a survey in 15 years, but we do know that the species has practically disappeared from Arkansas waters."

Figg says his office is very interested in hearing from people who encounter hellbenders. "We're especially asking cold-water giggers to keep their eyes open", he said.

Figg can be contacted at the Missouri Department of Conservation, P.O. Box

Zebra mussels are rapidly spreading throughout the major waterways of Mississippi River Basin. They have recently been documented at several locations on the Ohio River; and at Greenville, MS, Minneapolis, and several navigation locks on the Mississippi. Of most concern to biologists is the fact that Mississippi River clammers are reporting numerous instances of zebra mussels attached to native mussel fauna at several locations.

Recent collections made by U.S. Fish & Wildlife Service biologists at Greenville, MS

have all been microscopic larval forms of the mussel. Biologists are hoping that warmer temperatures in the southern U.S. may limit the mussel's spread in that area.



There is also some speculation that fast flowing river habitats may be unfavorable to zebra mussel colonies. Robert McMahon, University of Texas, reports in his book "Ecology and Classification of North American Freshwater Invertebrates" that compared to native mussels, the zebra mussel's planktonic veligers are poorly suited to high-flow, fast moving rivers. So unless there is regular introduction of veligers from upstream locations, colonies may tend to diminish. The presence of upstream impoundments seem to play a key role in keeping populations high in European rivers.

A new book on zebra mussels by research biologist Tom Nalepa of the National Oceanic & Atmospheric Administration Great Lakes Laboratory and Don Schloesser of the Fish & Wildlife Service National Fisheries Research Center-Great Lakes is due in November. The book entitled "Zebra Mussels: Biology,





Impacts and Control" will be published by Lewis Publishers, Inc., 2000 Corporate Blvd. N.W., Boca Raton, FL 33431. Cost will be \$69.95.

One of the problems in monitoring the spread of zebra mussels has been the inability to identify the veligers in the water column before they settle on a substrate. The Wisconsin Sea Grant Institute reports that examination of water samples with a binocular microscope with polarized filters makes the veligers "glow brightly against a dark background." This is particularly useful in samples with a lot of organic debris such as algae. Further information on this technique can be obtained from the University of Wisconsin-Green Bay Sea Grant Zebra Mussel Watch (414) 465-2795.

Source: U.S. Fish & Wildlife Service and UMRCC Newsletter July/August 1992.

## Hydropower Concerns

It appears that a FERC decision on granting a license for the LeClaire, IA (Upper Mississippi River Lock and Dam 14) hydropower project will be made soon. The LeClaire project is being watched by many hydropower interests as an indication of how future projects will fare, and how recommendations to protect riverine fish movements will stand up in the licensing process.

FERC recently indicated that the project appeared marginally economical, in which case it has been their practice to deny a license. The City of LeClaire was given until this summer to present evidence to the contrary. According to the City's engineering consultant, the high cost of fish mitigation measures prescribed by the Fish and Wildlife Service is the reason for the marginal economics. In an effort to circumvent the Service's prescriptions, the City has written to Secretary of Interior Manual Lujan requesting that the Service's prescriptions be changed to

recommendations rather than prescriptions. If this request was granted, LeClaire would most likely not incorporate these fish protection measures in the project.

After learning of the request, the UMRCC wrote to Secretary Lujan urging that the Service's prescriptions remain mandatory. UMRCC is concerned that changing the status of the fish measures would set a very poor precedent for protecting commercial and recreational fisheries at the many other hydropower project sites under study along the river. The Service's prescription called for a large screening mechanism to divert fish away from the plant's intakes, and provisions for fish passage.

Another precedent setting hydropower project (for the Upper Mississippi) is under active study for Lake Pepin. Lake Pepin is a large natural river lake on the Upper Mississippi formed by its confluence with the Chippewa River flowage out of Wisconsin. Lake Pepin is located about 50 miles downstream from the Twin Cities.

In this project the Southern Minnesota Municipal Power Agency (SMMPA) wants to build a 500 megawatt pumped storage project near Lake City, MN. The plant would be located on the River's bluffs and serve to meet peak demand during the day and pump water up to a reservoir at night. It is estimated that approximately \$10 million in environmental studies would be needed to prepare their license application. SMMPA is expected to decide later this year on whether or not to proceed with the licensing procedure.

Source: UMRCC Newsletter July/August 1992.

## Decline in Fishing

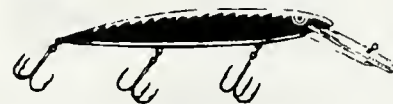
Marketing surveys commissioned by the American Fishing Tackle Manufacturers in 1990 and 1991 showed that there was a 9% decline in the number of anglers -- down from 69 million to 62.5 million.

According to Tom McClernon, senior buyer for K Mart Corporation in Troy, MI and Chairman of the newly formed Sportfishing Promotion Council (SPC), "An adult or parent taught most of us to fish, but the ability to pass on that tradition has really been interrupted in this country, and our goal is to make it as easy as possible to give kids an opportunity to fish".



McClernon thinks, "...the decline can be stemmed somewhat. Fishing as an activity receives no marketing outside of the industry. I think marketing has to be extended to the general population to reach the entry level person."

"Fishing is going to make a comeback, and it's going to come back stronger than ever, said Joe Kuti, President of the SPC. The SPC is headquartered in Barrington, IL and is pouring \$400,000 into activities aimed at promoting the sport. Of those funds, \$250,000 came from a U.S. Fish & Wildlife Service grant and over \$125,000 has been raised through donations from the fishing tackle industry.



The States as well as the industry are concerned about the decline because fishing license sales as a percentage of the population have been slightly declining across the country, reducing the potential revenues for state and federal fishery management work.

The first year's promotion by the SPC included 13 weeks of public service spots featuring George Jones and Travis Tritt on country music radio stations across the nation. There were also industry, state, and federally organized activities for kids and adults staged across the nation during National Fishing Week -- mostly in urban areas -- aimed at exposing people to fishing for the first time or bringing them back to the sport.

### In Search of Quiet

During the first week of October Gordon Hempton, self dubbed as the Sound Tracker, pushed his canoe off from the shores of Lake Itasca, headwaters of the Mississippi, to begin paddling downstream in search of quiet. Hempton's only companion will be his spooky, tripod-mounted latex head, built to simulate human hearing.



Hempton is a dedicated recording artist of nature sounds. He plans to drift and paddle some 2,200 miles downstream to New Orleans creating a sound portrait of the Mississippi River, with the spirit of Mark Twain as his guide. He plans to reach New Orleans in about 5 months, before returning home to Seattle in March.

Hempton has travel across the USA, and around the world patiently searching for the "sound of daybreak". His work was the subject of a PBS documentary on Sunday October 4th.

Quiet places aren't easy to find, Hempton says. He was inspired for the Mississippi River trip by a visit to Turtle Island near Hannibal, Missouri, where he recorded the songbirds as Mark Twain described, "just going it!" "Even traveling around the world, never have I heard such a moving, heart-lifting, cheerful, danceable

chorus, Hempton said.

"The Mississippi River remains one of the most scenic rivers in America", Hempton says. But "turn up the volume" on those silent pictures, and it's a completely different experience. Freight trains rumble on tracks near the river. The engines of tugboats groan to move their charge of barges upstream. Cars and trucks cut the quiet with a macadam whoosh. Power lines add their megahertz hum. Jets roar overhead. Unmuffled irrigation pumps drum away.

According to Hempton:

- The hum of power lines can be heard upward of 2 miles
- A chain saw cuts the quiet for more than 5 miles.
- Road noise can travel 8-10 miles.
- A coal-fired power plant can be heard as far as 15 miles away.
- A major airport can cast a "noise shadow" longer than 50 miles.

"Most people today", Hempton insists, "while they talk about quiet, do not have the experience of pure listening." He likens it to watching the Milky Way at night: Only when you get away from the ambient city lights is it possible to "become lost in the stars" -- just as you can become immersed in the sounds of nature and feel a part of life's great symphony. "Once you've heard the music of nature in its grand performance, the music never stops in your mind. You're always after more." He terms these blessed listening experiences "acoustical nutrition".

Hempton likens quietude to an endangered animal species and hopes his Mark Twain recordings will help publicize a budding Quiet Places Preservation campaign. Among his objectives: to open America's ears to the lack of quiet -- even in our huge national parks and wildlife preserves -- and to help the rare community that has a pristine listening spot to preserve and promote its endangered resource.

Gordon Hempton can be reached by writing to him c/o USA WEEKEND,

1000 Wilson Blvd., Arlington, VA 22229-0012.

Source: USA WEEKEND Magazine, October 2-4, 1992.

### The McKnight Foundation Announces Mississippi River Grants

The Minneapolis based McKnight Foundation recently announced nearly \$300,000 in grants for Mississippi River work which may have broad application.

Michael O'Keefe, Executive Vice President for McKnight, said, "These grants respond to ideas originating outside the Foundation. They support a variety of topics and strategies designed to meet local conditions..."

Grants include (1) development of techniques for reducing agricultural impacts on the environment, (2) assisting local groups to work to protect the environment of the Mississippi River and river-side communities, and (3) assisting with problems affecting people who are poor or disadvantaged.

The following is a list of grants of interest to fish and wildlife:

- **Arkansas Land and Farm Development Corporation, Brinkley, AR** -- Support for the Woodlands Management project, a training



program to improve farmers' management of forests in Arkansas' Mississippi River delta (\$25,000).



Contact Wilber Peer (501) 734-1140.

- **Carpenter Nature Center, Hastings, MN** -- Support for training to rehabilitate wildlife involved in major chemical spills on the Mississippi River (\$22,000). Contact Jim Fitzpatrick (612) 437-4359.

- **Coalition to Restore Coastal Louisiana, Baton Rouge, LA** -- Support to develop a citizens' plan to restore the coastal wetlands of Louisiana's Mississippi River delta (\$43,000). Contact: Michael Mielke (504) 766-0195.

**Institute for Conservation Leadership, Washington, D.C.** -- Funds to develop the Mississippi River Basin Alliance, coordinating efforts to restore the health of the Mississippi River (\$20,000). Contact: Dianne Russell (202) 466-3330.

**Land Stewardship Project, Lewiston, MN** -- Funds to promote profitable, environmentally sound farming methods in the Whitewater River basin tributary to the Mississippi River (\$43,000). Contact: Doug Nopar (507) 523-3366.

**Louisiana Coalition, Inc., Baton Rouge, LA** -- Support for the "River Communities Leadership Development Project", to strengthen citizen organizations working on environmental issues in Mississippi River communities between Baton Rouge and New Orleans (\$24,328). Contact: Zack Nauth (504) 766-1484.

**Minnesota Department of Natural Resources, St. Paul, MN** -- Support for an education program, Mississippi River Fish Contamination: Information and Education for Southeast Asian Communities (\$53,592). Contact: Steven Johnson (612) 296-0568.

**The Minnesota Project, St. Paul, MN** - Funds to produce a directory of existing river stewardship networks in the Midwest and United States (\$13,959). Contact: Beth Waterhouse (612) 645-6159.

**National Fish and Wildlife Foundation, Washington, D.C.** -- Funds for an analysis of the roles and budgets of federal agencies responsible for the Mississippi River's environment (\$35,000). Anne Kinsinger (202) 857-0166.

**Southern University Center for Energy & Environmental Studies, Baton Rouge, LA** -- Support for a project ranking environmental issues and recommending strategies for their solution in the Mississippi River corridor from Baton Rouge to New Orleans (\$19,711). Robert Ford (504) 771-4723.



extinction of plants and animals; and a loss of wetland areas.

### Natural Resource Conservation: Where Environmentalism Is Headed in the 1990's

The subject publication was recently released by the Times Mirror Magazines and summarized in a presentation made at this year's Annual International Association of Fish and Wildlife Agencies meeting in Toledo, OH. The survey was conducted by The Roper Organization for Times Mirror.

The following summarizes some of the major findings:

- About 3 in 10 Americans think of themselves as "active environmentalists" while another 52% say they are "sympathetic" to environmental concerns though not active.

- Underlying the public's environmental concerns is a strong emphasis on protecting human health. This explains why the most serious problems, according to the public, include water pollution, toxic waste dumps, shortages of good drinking water, air pollution, and damage to the ozone layer.

- Broad ecological problems have not been as widely feared, although these issues are gaining wider attention in the press and among key groups of Americans. These ecological problems include a loss of open areas, woods, and natural places; global warming; the

- Reflecting widespread concern about the environment, nearly two-thirds think environmental laws and regulations have not gone far enough. This result is all the more impressive considering the nation was mired in recession at the time of interviewing and the President recently had mentioned efforts to reduce such regulations as a way to bring on economic recovery.

- The public's environmental concerns are reflected in its regulatory priorities. Although majorities favor increased regulation in all five areas asked about, the most pressing have strong human health implications -- in particular, efforts to fight air and water pollution. Majorities also think tougher regulations are needed to protect wild and natural areas, wetlands, and endangered species.

- Nearly two-thirds think that economic growth and environmental protection can go hand in hand, while merely 1 in 4 believe a choice must usually be made between the two.

- When reasonable compromises between environmental protection or economic growth cannot be found, Americans overwhelmingly side with the environment. Nearly two-thirds think the environment is the more important concern, while only 17%

come down on the side of economic growth.

- Most Americans are conservationists, rather than preservationists, in that they believe natural places and things can be protected even while natural resources are used for the benefit of people and the economy.
- Virtually everyone believes it is possible to find a good balance between economic development and environmental protection goals, and that environmental quality is heading in a positive direction. One reason is a majority think technological solutions will help protect the environment.
- Even while optimistic about our chances for success, a substantial number of people view the present environmental situation as being extremely urgent.



- Half of Americans think federal efforts to protect endangered species have not gone far enough. But at the same time, they think the 1972 Endangered Species Act should be changed to consider costs and to make sure all species at risk receive proper, scientific consideration.
- The strongest arguments for protecting endangered species, according to the public, include the benefits that humans receive from

protecting them, the need to maintain nature's delicate ecological balance, and a desire to fulfill a moral duty to protect all living species. But the public also thinks excessive cost can be a strong argument against protecting a particular species of plant, animal, or insect.

- With respect to wetlands, Americans' gut reaction is that more --not less-- should be done to protect these important resources. Nevertheless, there is a great deal of ambivalence regarding the technical definition of what constitutes a wetland.
- Americans believe natural places and resources can be used for the benefit of people and the economy while also being protected. But they also strongly believe most commercial users of public natural resources ought to pay a fee to the government. In particular, they say companies involved in logging, hardrock mining, oil drilling, ski area development, livestock grazing, and commercial fishing should pay for the right to use federal resources. Recreational activities--with the exception of hunting--are considered acceptable without payment of a fee.
- Even at the risk of slower economic growth and fewer jobs in a recession, most Americans say it is worth making sacrifices for the sake of wetlands and endangered species protection.
- Taxpayers advocate "no new taxes" for the environment, but at the same time would shift federal spending from other areas into environmental programs.
- Consumers are willing to make a number of financial sacrifices in order to protect wildlife and the environment. But they will not make any and all sacrifices. Some ideas--such as tearing down large hydropower dams to help subspecies of salmon survive--are not considered worth the cost in higher utility rates for consumers.
- The rights of property owners are believed secondary in importance to protecting wetlands and endangered species. Even if it means that a

financially strapped homeowner cannot sell a portion of land that is classified as a wetland to raise cash, the public says the environment is the more important concern.



- When trade-offs are made for the benefit of the environment, the public thinks that the costs should be paid by society as a whole, not by individuals alone. Whether to protect an endangered species or a wetland, most think property owners should be compensated financially when restrictions are placed on private land use.
- About a fifth of the public say they previously have cast votes on the basis of a candidate's environmental record. Compared to other people, these "green voters" are more educated, affluent, liberal, and more involved with outdoor activities.
- While green voters share many of the same concerns as other people, they are far more attuned to ecological issues such as the importance of wild and natural areas, wetlands, and biological diversity. If the federal environmental agenda is a reflection of the priorities of the body politic, then these conservation-oriented issues will continue to come to the forefront in the years ahead.

Copies of the complete document entitled "Natural Resource Conservation: Where Environmentalism Is Headed In the 1990's -- The Times Mirror Magazines National Environmental Forum Survey, June 1992" can be obtained by contacting The Roper Organization Inc., 205 East 42nd Street, New York, NY 10017.





## MICRA Newsletter Questionnaire

Name \_\_\_\_\_

Address \_\_\_\_\_

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\_\_\_\_\_ I like the format of the Newsletter, please keep sending it to me.

\_\_\_\_\_ I do not like the format of the Newsletter, here are my suggested changes:

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\_\_\_\_\_ I recommend sending copies of the Newsletter to the following persons/groups:

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Additional Comments: