American Fisheries Society North Central Division
Rivers and Stream Technical Committee
Annual Spring Meeting
March 23 and 24, 2004
Rock Island Conservation Club
Milan, Illinois

March 23 - Tuesday

1:00 – 1:30

Welcome and call to order . . . . . (Rob Pulliam)

Secretary/treasurer's report . . . . . (Paul Kanehl)

Old business – winter meeting summary. . . . . (Rob Pulliam)

RSTC chapter reports – Iowa, Indiana, Illinois, Kansas, Michigan, Mid Canada, Minnesota, Nebraska, North and South Dakota, Ohio, Ontario, Wisconsin, and Missouri.

1:30 – 3:00

New Business

- Who's Who Update . . . . . (Ed Peters or Paul Kanehl)
- Goals and Responsibilities of RSTC . . . . . (Rob Pulliam)
- Chairperson and Secretary nominations and votes . . . . . (Rob Pulliam)
- Other new business . . . . . (Open to all)

3:00 – 3:15

Break

3:15 – 5:15

Presentations:

Doug Clark	Rootwad hummocks for large river systems
Eric Merten	Using site-specific correlations for predicting trout abundance from single-pass electrofishing
Greg Gelwicks	Channel catfish movement and habitat use in the Wapsipinicon and Turkey Rivers, Iowa

6:15 – 6:30

Busses leave from La Quinta Inn and travel to Rock Island Conservation Club

6:30 – 10:15

Fish fry dinner, visit, and busses return to La Quinta Inn.

March 24 – Wednesday

8:00 – 12:00

Presentations:

Mark Cornish or Wilcox	Improving fish passage through navigation dams on the Dan Upper Mississippi River System
Gary Siegwarth	Construction of a low-cost pool and riffle fish passageway around the Quasqueton Dam on the Wapsipinicon River
Gary Siegwarth	Iowa's trout program
Break – 15 minutes	
Jim Mick	Illinois River ecosystem restoration project
Rob Pulliam	Seven steps to marketing watershed management
Jeremy Tiemann	Anthropgenic disturbances on streams
Don Roseboom	Rapid stream assessment tool/Stream projects review 30 minutes

12:00 – Thanks for coming and have a safe trip home

American Fisheries Society
North Central Division
Rivers and Streams Technical Committee
Annual Spring Meeting
State Chapter Reports

Iowa Chapter Report

March 23, 2004

Greg Gelwicks
Iowa DNR Fisheries Research

Southwest Iowa Fish Passage

Riverbanks and beds in the 22 county loess region of southwestern Iowa are highly susceptible to erosion. Streambed stabilization structures have been widely used to protect the infrastructure of bridges and roads in this region. During the last 10 years over 400 streambed stabilization structures have been constructed in Missouri River tributary streams located in western and southern Iowa. Additional structures are proposed or currently under construction on approximately 400 other susceptible bridges. A vast majority of these structures are of one design, involving a sheet piling dam and a 1:4 downstream slope constructed of rock rip-rap. These potential blockages to fish migration raised concerns and prompted regional fisheries personnel to investigate possible impacts to stream fishes.

In 2003 the Cold Springs management team continued to work in conjunction with Iowa State University in a joint study on the impacts of weirs on fish movement in Walnut Creek and Turkey Creek (Cass County) that began in 2001. The six weirs in the study area on Walnut Creek are all four feet in height and have a experimental 20:1 downstream rock slope. The four weirs on Turkey Creek are also four feet in height, but have a traditional 4:1 downstream rock slope. Biologists studying fish movement over the two weir designs sampled twelve separate sites on Walnut Creek, covering 30 miles, and six sites, covering 20 stream miles on Turkey Creek. Targeted species were channel catfish, bullhead, flathead chub, and creek chub. These species were captured using baited hoop nets and minnow traps. Captured fish were marked with site-specific fin clips or numbered tags throughout the period from May 20th to August 9th, 2003.
In Walnut Creek 726 channel catfish were captured and marked. Thirty-seven were subsequently recaptured, with 89% exhibiting no movement over weirs. Eight percent of the recaptured catfish were found to have moved upstream, while 3% were found to have moved downstream over one or more of the 20:1 designed weirs. Six hundred nine (609) creek chubs were captured and marked. Sixty-four were recaptured with 97% exhibiting no movement over weirs. Three percent were found to have moved upstream over one or more of the 20:1 designed weirs. In Turkey Creek, 333 channel catfish, 167 bullheads, and 159 creek chubs were captured and marked. None exhibited movement over 4:1 designed weirs. Over the three year study, significantly more recaptured fish exhibited movement over the 20:1 designed weirs than 4:1 designs.

The experimental design of a fish ladder weir on the East Tarkio River near Yorktown (Page County) was evaluated for fish movement. Flow measurements ranged from 0 to 6.1 feet per second through the weir ladder. Backpack electro-fishing during mid July below the weir sampled 1143 fish. All fish were fin

clipped and released below the weir. Backpack electro-fishing above the weir ten days later recaptured two marked fish consisting of one sand shiner and one sucker mouth minnow.
An agreement was worked out with the Hungry Canyon's Alliance (HCA) on functional weir design and maintenance for SW Iowa streams. Biologists classified streams based on ecological criteria for use by HCA engineers in selecting proper weir design. Streams were classified as 0, 1, 2, with category 2 streams as having the most potential of supporting a fishery. These category 2 streams require a minimum weir slope of 1:20 for fish passage purposes. A category 1 stream (questionable fisheries) requires a 1:15 slope for passage and may also permit approved fish passage designs for experimentation. Biologists are working with HCA to secure funding for modification of earlier constructed weirs that do not meet the above criteria.

Two grant proposals, intended for studying fish movement patterns following weir modification were written. One grant to the FWS for fish passage construction monies and one to the USGS for monitoring monies. Both proposals were approved for funding is 2004 and 2005. In total the department will receive $25,000 from FWS and $35,000 from USGS. This will be a joint project between IDNR, Iowa State University Fish & Wildlife Coop Unit, Cass County Engineers Office, and the Hungry Canyon's Alliance. Contact: Chris Larson, (712) 769-2440, chris.larson@dnr.state.ia.us.

Missouri River

The Missouri River Mitigation project is progressing and restoring habitat along the channelilized portion of the river below Sioux City, IA. Willing sellers have been identified for key land parcels in the Iowa reach and purchasing procedures are in progress. Iowa is currently working with the Corps in identifying sites for the construction of Pallid Sturgeon habitat. Contact: Andy Moore (712) 769-2440, andy.moore@dnr.state.ia.us.

Dam Removal

A cooperative project with the Floyd County Conservation Board for removal of the Rockford Dam on the Shell Rock River was initiated. A public meeting was held and an application for federal fish passage grant funding was submitted to the US FWS. Plans call for the removal of the dam to streambed level, widening and sloping of a new channel based on a reference reach, and the addition of two rock riffle structures for grade stabilization and habitat improvement.
Initial pre-project work was also conducted on a proposed removal of DNR-owned Upper and Lower Dams on the Upper Iowa River (Winneshiek County). Contact: Bill Kalishek, (563) 382-8324, bill.kalishek@dnr.state.ia.us.

Waterloo Creek Restoration Work

Two stream restoration projects are currently underway on Waterloo Creek, a popular trout stream in NE Iowa. One project involves the remeandering of a spring run that was channelized along the road ditch. Plans call for returning the stream to its original channel to restore meanders. The other project involves the restoration of 50 acres along a 1-mile stretch Waterloo Creek to native prairie vegetation. The project is being funded by a Trout Unlimited Embrace a stream grant, and plans include monitoring terrestrial and aquatic invertebrates before and after restoration. Contact: Bill Kalishek, (563) 382-8324, bill.kalishek@dnr.state.ia.us.

Aquatic Nuisance Species (ANS)

The U.S. Army Corps of Engineers, Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, Illinois Department of Natural Resources, and Iowa Department of Natural Resources collected zebra mussel

veliger samples from the Upper Mississippi River and its major tributaries during July and August 2003. In Iowa, DNR staff collected samples below Lock and Dam 10 through 19 and from the Wapsipinicon, Iowa, and Cedar Rivers. No tributaries in Iowa are known to be infested with zebra mussels. The three tributaries sampled are being stocked with fish inoculated with Higgins' eye pearlymussel (Lampsilis higginsi) glochidia. It is essential that we identify any zebra mussels in these tributaries to protect the endangered Higgins' eye pearlymussel.

Watercraft inspections addressed two main ANS concerns in Iowa: the extent of transportation of ANS by boaters in Iowa and the level of publicknowledge regarding invasive species. Seasonal employees discussed inspecting watercraft for ANS with the operators and collected information on ANS presence, watercraft type and state of registration, number of people, last and next waterbody visited, and operator familiarity with Eurasian watermilfoil, zebra mussels, and Iowa's Eurasian watermilfoil law. Contact: Kim Bogenshutz (515) 432-2823, kim.bogenshutz@dnr.state.ia.us.

Mississippi River Long Term Resource Monitoring Program Activities

Draft 10-year (1993-2002) reports for the fish, macroinvertebrate, and vegetation components were completed in 2003 and are currently under review. These component reports examine spatial and temporal trends in fish, macroinvertebrates, and vegetation in the Upper Mississippi River System. An additional draft report focusing on spatial and temporal patterns in fish species distribution, rate of gain, size structure, and abundance was completed and is currently under review. Fisheries and water quality sampling was minimal in 2003, but is scheduled to increase substantially in 2004. Contact: Dan Kirby, (563) 872-5495, daniel.kirby@dnr.state.ia.us

Coldwater Stream Classification

Iowa is in the process of modifying its current surface water use classification for coldwaters into two tiers. A formal coldwater protocol has also been drafted that will be used to assess and assign current and proposed coldwater streams and spring runs. The proposed classification system and protocol are expected to become final by fall 2004. Contact Dave Moeller (563) 927-3276, dave.moeller@dnr.state.ia.us.

Des Moines River

We are continuing gathering our first years of standard sampling of all major fish species on the Des Moines River. While this sounds like a simple task, this is a fairly major river system, yet it has had no standard sampling regime in place to this point. Our efforts cover most of the area from Red Rock Lake to Van Buren County. Sampling gears include DC electrofishing and hoop netting. Results have been relatively disappointing so far in terms of catch of game fish. We continue to familiarize ourselves with the habitat of this important resource.

In addition, the Corps of Engineers recently completed a reconnaissance study on the lower Des Moines River (Red Rock and downstream) to evaluate potential impacts of current water level and release regimes from the mainstem reservoirs (Saylorville and Red Rock). Interested citizens have pursued the DNR and the COE in an effort to air concerns regarding what they perceive to be higher than normal spring flows and lower than normal summer flows. In addition much concern regarding channel widening exists. The reconnaissance study was ruled a "non starter" as the COE maintains insufficient evidence exists to merit further evaluation.

The hydropower dam at Ottumwa is up for FERC relicensing in April of 2008. The DNR and other interested groups began talks with the FERC and the city of Ottumwa to determine the requirements for

this relicensing. Major issues associated with the dam are fish passage and flow. Currently we are unsure as to the impediment of fish migration as a result of current dam management. In addition, the dam is licensed as a "run of river" facility. However, peaking flows have been the rule and the effects of these intermittent flows can be seen far down river. Continued discussion among interested agencies will continue in 2004. Contact: Mark Flammang, (641) 647-2406, mark.flammang@dnr.state.ia.us.

Iowa Stream Management Workshop

The Iowa DNR continues to host the Iowa Stream Management Workshop. The workshop is modeled after the Missouri Department of Conservation's Stream Management Workshop, and has been adapted to Iowa. Natural resource professionals from Iowa DNR Fisheries, Water Quality, Information & Education and Geological Survey Bureaus; Iowa State University Forestry Dept.; and the Iowa Dept. of Ag and Land Stewardship present the workshop. The workshop addresses stream dynamics from a watershed perspective and stresses the interaction of the physical sciences (hydrology, hydraulics, geomorphology) and their relationship with the stream's biota. The target audience is field staff from all agencies in Iowa that are involved in the management or restoration of stream systems. The goal of the workshop is to provide participants with a common understanding of: stream and watershed processes; relationships of streams with their floodplains, riparian zones, and watersheds; impacts of human activities on stream equilibrium; and what may or may not be attainable for stream restoration. This year's workshop will be held July 13-15. More information can be found at http://www.iowadnr.com/education/resrcpro.html.

Biomonitoring

Tom Wilton with the Environmental Protection Division of the DNR has completed 3 years of follow-up fish surveys on streams that have been affected by major fish kills (23 streams were sampled and the length of time between fish kills and follow-up sampling ranged from 5 to 60 months [weblink to report: http://www.iowadnr.com/water/tmdlwqa/pres_pub.html]). Tom has also finalized a fish IBI for wadeable streams in Iowa [weblink to draft final document: http://www.iowadnr.com/water/tmdlwqa/wqa/streambio/] and will be beginning work on and fish IBI for non-wadeable streams.

Staff of the Iowa DNR TMDL and Water Quality Assessment Section and the University Hygienic Laboratory Limnology Section continue gathering benthic macroinvertebrate and fish assemblage data that are used to assess the biological condition of Iowa's rivers and streams. Approximately 70-80 stream sites are sampled each year. The bioassessment program, which began in 1994, has 3 main focus areas: 1) status and trend monitoring; 2) development and maintenance of reference (benchmark) biological criteria; 3) impaired (TMDL) waterbody assessment. In the last two years, sampling objectives have emphasized stream nutrients (N & P) and their relationships to primary production, dissolved oxygen flux, and biological integrity indices. Contact: Tom Wilton, (515) 281-8867, tom.wilton@dnr.state.ia.us.

SW Iowa Management Teams began a fish and habitat monitoring effort on southwest Iowa streams in 2002. During 2003, they sampled 19 sites in 10 streams for fish population and habitat status using the Habitat Evaluation Procedures for Wadeable Streams and Rivers of Iowa protocol developed by Tom Wilton, ESD Water Quality Bureau.

Water Quality

Iowa DNR fisheries personnel continue to be heavily involved in multidisciplinary watershed projects partnering with local communities and landowners, USEPA, NRCS, Iowa Department of Agriculture and Land Stewardship, and other groups.

The Geological Survey Bureau and Environmental Protection Division of the DNR have been very active in expanding and improving its Ambient Water Quality Monitoring Program over the last several years. Information about the program can be found at http://wqm.igsb.uiowa.edu/.

The IOWATER program continues to expand. Volunteers are collecting baseline water quality data across the state. This information can be found at http://www.iowater.net.

Freshwater Mussels

Scott Gritters, IDNR Mississippi River Fisheries Management, continued to serve as chairperson of the Pilot Protection and Relocation sub-team of the Higgins eye pearly mussel, Lampsilis higginsi, "Jeopardy Opinion". Projects completed in 2003 using federal "Opinion" funding included: 1. Assisted Mark Farr on contracted surveys with the COE on various Mississippi River pools. 2. Completed the second year of monitoring endangered mussel stockpile projects at Cassville Slough and near Cordova. 3. Coordinated the spring stocking of nearly 3,000 largemouth bass, smallmouth bass and walleye inoculated with Higgins eye glochidia in the Cedar, Iowa and Wapsipinicon Rivers. 4. Raising 41 YOY Higgins eye in a floating cage in the Guttenberg harbor. 5. A mussel survey was conducted and a new stockpile site was created in Harper's Slough near Harpers Ferry (Pool 10, Clayton County). 6. An additional fall inoculation effort was accomplished on the Iowa River using mainly hatchery walleye and largemouth bass, but also some wild fish. A total of 1,367 walleye, 278 largemouth bass and 250 smallmouth bass were inoculated and stocked in the Iowa River.

The "Iowa Mussel Team", a group of representatives from various agencies, NGO's and university staff completed two projects in 2003: 1. Thanks to the Geode RC&D the video on freshwater mussels titled "Canaries of the Deep" was completed and distributed. 2. A mussel survey was completed on four reaches of the Des Moines River between the Red Rock dam and the City of Ottumwa. This effort was completed in large part to a volunteer effort from the Iowa Soil and Water Conservation Society.

Iowa DNR Fisheries management personnel collected and transported small fingerling flathead catfish to assist the US FWS Genoa NFH staff conduct research on the endangered maple leaf mussel, Quadrula quadrula.

Coordination with the US FWS Genoa NFH staff allowed the stocking of 9,000 transformed hickorynut mussels, Obovaria olivaria, into the Cedar River, 8,000 transformed hickorynuts into the Iowa River and 50 transformed spike mussels, Elliptio dilatata, into the Iowa River. In addition, inoculated fish stockings included 300 smallmouth bass inoculated with pocketbook mussels, Lampsilus cardium, and 20 walleye inoculated with black sandshell mussels, Ligumia recta, into the Iowa River. Contact: Scott Gritters (563)252-1156, scott.gritters@dnr.state.ia.us.

Interior Rivers Research

Contact: Greg Gelwicks, (563) 927-3276, gregory.gelwicks@dnr.state.ia.us

Interior River Habitat and Fish Community Assessment

We are continuing to inventory and evaluate interior river and stream habitat conditions and fish communities. Data collected for this project is being used to help build the Iowa River Information System (IRIS), a statewide GIS database that will integrate existing and future information related to rivers and streams in the state.

Use of Available Interior River Habitat by Gamefish Species

Radio-telemetry has used to monitor seasonal movements and habitat used by gamefish inhabiting the Wapsipinicon and Turkey Rivers. Field work on the Turkey River was completed in 2003. Our habitat surveys have found deep-water habitat to be more limited on the Turkey River than in our study area on the Wapsipinicon River. Beginning in September 2000, various sizes of channel catfish, walleye, and smallmouth bass were radio-tagged and tracked in the Turkey River. Radio-tagged individuals of all species moved long distances to the Mississippi River and overwintered. All channel catfish radio-tagged in the Turkey River moved to the Mississippi River as winter approached. All of these fish, except those that died or were caught by commercial fishermen, returned during spring months to locations where they were originally tagged and released. Habitat surveys indicated deep pools were not abundant on most interior rivers, thus the availability of this habitat may limit gamefish populations.

Evaluation of the Status, Distribution, and Habitats of Flathead Catfish in Iowa's Rivers

Greg Gelwicks and John Pitlo developed a coordinated statewide research project to evaluate flathead catfish populations in Iowa. Work on the five-year project began in July 2003. The study is designed to build on knowledge obtained from management investigations conducted on the Mississippi River by Gene Jones, Bernie Schonhoff and Kevin Hanson, and on interior rivers of southeast Iowa by Don Kline. The project will evaluate methods used to sample flathead catfish, assess populations, evaluate their distributions and movements, determine relationships between populations and habitats, and evaluate the fishery.

Mississippi River Research

Contact: John Pitlo, (563) 872-4976, john.pitlo@dnr.state.ia.us

A study of walleye/sauger population parameters is being conducted in tailwaters of Lock and Dam 10 and 12 at Guttenberg and Bellevue. The study includes creel surveys and estimates of exploitation of these species. Fall 2002 tailwater fish surveys at Guttenberg and Bellevue indicated 1998 and 1999 year classes of walleyes were below average. The good news is that strong 2000 and 2001 year classes of walleye and sauger should carry the fishery for the next several years. The 2001 year class is two to three fold stronger than any other year class we have documented during the 1992-2002 study period. However the 2002 year class for both walleye and sauger were the lowest we have documented for the 1992-2002 period at Bellevue and somewhat below average for both species at Guttenberg.

A telemetry study is being conducted in Pool 13 to document habitat selection and spawning movements of adult walleye. The greatest amount of movement occurs in the late winter and early spring when fish are moving to spawning areas. Annual movements of twenty to forty-five miles are common as adult fish move from winter habitats to spawning habitats and then return to summer areas. Three spawning areas have been documented in Pool 13; all have characteristic rock-rubble, gravel, or mussel bed substrates. Additional monitoring of radio tagged fish during the winter period will be undertaken during the next several years to document any changes in winter habitat that may result from changes in wing dam and closing dam construction in lower Pool 13.

Channel catfish population relative abundances and reproductive success are being evaluated in Pools 9, 11, 16, and 18. Channel catfish populations in the Upper Mississippi River continue to show improvement and stability after the regulation change in 1985 that increased the length limit for commercially harvested catfish from 13 to 15 inches. Today the commercial harvest is the highest since the 1960's. Channel catfish also continue to contribute significantly to the creel of sport anglers. During the summer surveys of anglers fishing Pools 11 and 13 from 1994-2002, channel catfish ranked from second to fourth behind freshwater drum and bluegill as the most numerous species taken. The density of channel catfish in the Upper Mississippi River is the highest its been in 30 years and is expected to remain high due to strong 1995, 1997, 1999, and 2002 year classes.

Winter habitat selection of bluegill and black and white crappies is being determined by radio telemetry. This study is designed to identify overwinter habitats and value of backwater restoration. Early results show that no matter where in a backwater complex the fish were tagged, nearly all the fish moved to several small, protected backwater lakes to overwinter. There was no current in these backwater lakes and water temperature was around 35-37 ^{o}F (main channel water temperatures were always around 32 ^{o}F). This study will be continued in different backwater complexes and Mississippi River pools during future project segments, so this information can be used to help direct rehabilitation of backwater complexes through the Habitat Rehabilitation Program.

Iowa State University

The following are river and stream related projects being conducted at Iowa State University.

Relationships of fish communities and availability of deep-water habitat

The purpose of this study is to examine relationships of fish communities and populations of channel catfish and smallmouth bass with availability of deep-water habitat. The objectives are to quantify quality deep-water gamefish habitat, fish community characteristics, and channel catfish and smallmouth bass population size and growth rates in the stream sections of interest; and to explore relationships of fish communities and gamefish characteristics with availability of deep-water habitat. In the summer of 2003, eight of 15 study reaches on 3 eastern Iowa rivers were surveyed for depth profile using a GPS/depth sonar. The collected data are being entered into ArcGIS for analysis. Fish community data from new collections and existing databases were compiled for 11 of the 15 study reaches. All fish community data have been entered into a database for further analysis. Smallmouth bass and channel catfish aging structures were collected from all study reaches. Structures have been cataloged and are being prepared for aging. Depth data will be used to create depth profiles and expressions of the availablity of deep-water habitat for each study reach. Further analysis will explore relationships between the availability of deep-water habitat, channel slope and basins. The fish community data will be used to calculate summary statistics (i.e. fish IBI scores, species abundances, etc.) for each stream reach. The summary statistics will then be used to explore relationships with the availablity of deep-water habitat. Smallmouth bass and channel catfish aging structures will be used to estimate age distributions and growth rates for each study reach. These estimates will be used to further explore relationships with the availablity of deep-water habitat. Contact: Jennifer A. Weidner (515)294-6936, levanfuz@iastate.edu.

Iowa Aquatic Gap Analysis Project

Objectives of the project are:

1. To classify stream reaches in terms of habitat quality for aquatic species using information available in IRIS.
2. To define range extent and habitat affinity of aquatic species using existing collection data.
3. To develop models predicting presence of aquatic species.
4. To generate predicted distributions of aquatic species state-wide using models and IRIS data.
5. To guide conservation planning by evaluating regions of predicted species occurrence in relation to riparian land use and stewardship.

The biological collection database has been completed and contains 10,984 community fish samples dating from 1884-2002, with a total of 93,768 species occurrence records. Using this data, statewide distribution maps for each species were generated on a watershed by watershed basis, using 8-digit and 10-digit hydrologic units. The maps for all fish species have been sent out for professional review. Using pre-professional review biological data, the valley segment type variables to be used in the prediction models are being determined. Once comments from the professional review process have been incorporated into the biological collection database, the data will be used to finalize statewide range maps

and develop models predicting presence of fish species. Models will be developed for each fish species based on aquatic subregion and/or at the statewide level using AnswerTree statistical software. Those species' models that cannot be developed using AnswerTree, will be developed using information gathered from existing species location data, from habitat affinity literature data and from contingency tables generated by a custom-designed Aquatic GAP SAS program (designed by Missouri Aquatic Gap and customized for Iowa Aquatic Gap). These models will then be used to generate predicted distributions of the fish species at the aquatic subregion and/or statewide. Contact: Clay L. Pierce (515) 294-3159, cpierce@iastate.edu.

Development and Use of the Iowa Rivers Information System (IRIS)

The goal of this project is to develop the Iowa Rivers Information System (IRIS), integrating physical, chemical and biological information into a comprehensive, user-friendly, statewide information system for interior Iowa rivers. The Iowa Rivers Information System (IRIS) is envisioned as a widely accessible tool for both professionals and the public to obtain information about rivers and streams in Iowa and the diversity of natural resources they support. The ultimate goal is to provide a single entry to the world of information about Iowa rivers and streams. Data and research products are available through IRIS, as well as web links to many other sites containing a wealth of information. IRIS is based on GIS principles and most of the available information is geo-referenced for mapping and spatial analysis. Uses of IRIS are only limited by the imagination. From the fisheries biologist seeking information to evaluate a stream's potential as a smallmouth bass fishery, to the water quality analyst searching for clues to explain differences in stream nutrient levels, to the classroom teacher helping students understand stream ecosystems, IRIS will be an essential tool. The true power of IRIS will be in how it simultaneously provides users with maps to visualize spatial relationships, spatially referenced databases, links to numerous other databases, and tools to work with data from a variety of sources, all linked by their location. All of this is being developed within a state-of-the-art web interface, bringing the power of IRIS to anyone with a computer and internet access.

The database created within ArcView 3.2 containing variables describing certain physical features of stream reaches in Iowa is complete with a few exceptions. The current web interface for IRIS (http//maps.gis.iastate.edu/iris/index.asp) has been built using a variety of server-side technologies including ESRI's ArcIMS and SDE technology. The IRIS website includes introductory material for the IRIS project, information about the IRIS attributes and data layers. Additional data layers have been added as they become available and links to metadata or information about the different data layers now exist. Based on user input, a decision was made to create two web-mapping interfaces to access the IRIS data. Data within the IRIS Explorer interface will be placed into general subject groups, and will be displayed within the map table of contents within these groups. A more detailed report is available at: http://www.cfwru.iastate.edu/assets/IRIS.pdf
Future expansion of IRIS coverages and capabilities will be in response to user feedback. In addition, IRIS will be linked to the DNR Fisheries, Lake Survey, IOWATER, Watershed Atlas, and other databases. Contact: Kevin Kane (515)294-0526, kkane@iastate.edu.

Monitoring of Fish Movement Patterns Following Modification of Two Streambed Grade Control Structures in Turkey Creek, Cass County, Iowa.

The objectives of this project are to determine if a 1:15 back slope design will allow migratory fishes bi-directional movement within the affected stream reaches, and to provide demonstration sites of successful structures to HCA members and other potential stakeholders involved in streambed stabilization projects. Riverbanks and beds in the 22 county loess region of southwestern Iowa are highly susceptible to erosion. Streambed stabilization structures have been widely used to protect the infrastructure of bridges and roads in this region. During the last 10 years over 400 streambed stabilization structures have been constructed

in Missouri River tributary streams located in western and southern Iowa. Those structures have been primarily funded through the Hungry Canyons Alliance or Emergency Watershed Protection. Additional structures are proposed or currently under construction on approximately 400 other susceptible bridges. A vast majority of these structures are of one design, involving a sheet piling dam and a 1:4 downstream slope constructed of rock rip-rap. These potential blockages to fish migration raised concerns and prompted regional fisheries personnel to investigate possible impacts to stream fishes. Recent intensive sampling by the Iowa Department of Natural Resources in affected tributary streams has shown a precipitous decline in the number of important regional fish populations, specifically channel catfish, flathead chub a species of concern, and other riverine species.

In 2001 – 2003 a cooperative study was conducted by the Iowa Department of Natural Resources (IDNR) in conjunction with Iowa State University (ISU) Department of Natural Resource Ecology and Management, and the 22 County Hungry Canyons Alliance (HCA). This study evaluated the effectiveness of redesigning stream stabilization structures to assist with fish migration. Six of the lower most streambed stabilization structures on Walnut Creek, Montgomery County, Iowa, were modified during the winter of 2000. Downstream slopes of structures were modified from previous 1:4 back slopes to 1:20 back slopes. Pre and post modification studies carried out by IDNR & ISU on fish migration indicated that targeted species were better able to navigate the gentler 1:20 back slopes. HCA has agreed to work cooperatively with the IDNR in redesigning selected grade control structures and designing new structures to the more acceptable 1:20 back slope designs. HCA is concerned with the significantly higher cost associated with modification of existing 1:4 back slope structures and in the new construction of 1:20 back slope structures. HCA has requested that the IDNR study fish movement patterns on structures that have been modified to 1:15 back slope design. Proposal has been accepted and plans are underway for recruiting student investigator. Funds available in the first year are far short of request, so first year work plan will be scaled back accordingly. Contact: Clay L. Pierce (515) 294-3159, cpierce@iastate.edu.

A Probabilistic Survey of Iowa's Stream Resources: Habitat

The primary goal of this project is to design and initiate a survey that will accurately and objectively assess the health status of Iowa's perennial streams. Habitat assessment is one component of the Iowa REMAP (Regional Environmental Monitoring and Assessment Program) project. In 2002, the DNR received a grant and technical assistance from EPA to begin the project. The state ambient monitoring program also contributes funding to support the project. The sampling design and some of the sampling methods are patterned after other REMAP projects in the Central Plains and across the U.S. This project will initiate an objective and statistically-powerful survey of Iowa's perennial streams and rivers. A stratified-random sampling framework will be used to obtain an unbiased sample population from which accurate statements about the status of Iowa's perennial streams can be extrapolated. The survey will measure several indicators of stream ecosystem health including: aquatic community integrity: fish tissue, sediment, and water contaminant levels; physical habitat quality; primary production and community respiration. Preliminary discussions are underway to finalize study plan. Contact: Clay L. Pierce (515) 294-3159, cpierce@iastate.edu.

An Integrated Immunological-GIS Approach for Bio-monitoring of Ecological Impacts of Swine Manure Pollutants in Streams

This research is predicated on the hypothesis that low levels of swine liquid manure slurry and anaerobic lagoon liquid released to open water cause changes in immunological response in fish and increase fish susceptibility to infection. The initial objectives, therefore, are 1) to evaluate this hypothesis through a series of laboratory immunological assays applied to the test organism, the fathead minnow (Pimephales promelas) and 2) to identify one or more assays for use as a bio-monitoring technique to detect ecological impact of manure pollution in nature. A subsequent task involves use of digital environmental databases

that are maintained and managed by the USGS BRD Iowa Cooperative Fish and Wildlife Research Unit at Iowa State University. The objective is 3) to characterize a number of Iowa watersheds and stream systems according to their potential susceptibility to hog manure pollution and to use this information to design a water quality and fish sampling regime. Finally, water and fish collected at selected stream sites will be analyzed through a battery of chemical and immunological procedures with the objectives 4) to quantitatively measure ecological impact of manure pollution on the streams, and 5) to evaluate the utility of this approach as a biomonitoring tool for environmental protection agencies.

Fathead minnow colony was succesfuly established during 2003 and is producing sufficient numbers of fish needed for the experiments. We have developed and constructed the computer controlled flow through system with automated dosing pumps for controlled exposure of experimental fish to various agents and chemicals.

During 2003 we have developed the isolation technique for extracting leukocytes from fathead minnow kidney. In short, the kidneys are aseptically removed to Ca/Mg free media, grinded in a tissue grinder, centrifuged on a 1078 Histopaque discontinuous cell gradient, washed and resuspended in adequate volume of Fish physiological saline.
We did morphological and cytochemical characterization of prepared leukocytes and have determined the average content of the kidney cell isolate to be >75% neutrophils, <20% lymphocytes and thrombocytes and <5% of other cells. Cells were characterized using morphological similarities with their mammalian counterparts when stained with Diff Quick. Cells were stained with following staining kits/procedures: Peroxidase #391, Sudan Black B, Alkaline phosphatase, Periodic Acid Schiff and Alpha-naphtyl acetate esterase.
We have started developing functional characterisation assays for evaluating neutrophil function. We have developed and optimized assay for measuring production of reactive oxygen species in isolated neutrophils by cytochrom C reduction method. We are currently developing other assays for measuring neutrophil function.

During 2003 and 2004 we plan to continue development of neutrophil functional assays and to expand existing batery of assays with several others (degranulation of primary neutrophil granules, iodination assay, myeloperoxidase cell content, etc). We plan to test known immunostimulative and immunosupressive agents, to calibrate assays and to establish baseline values for fathead minnow neutrophil function. During 2004 we plan to start developing GIS/flow path analysis tools for determining possible manure/chemical loads within a designated watershed. Also, we plan to define locations of the sampling stations within a designated watershed based on the stream channel and flow characteristics. During summer 2004 we plan to do the field test trials of the sampling gear and neutrophil assays on designated watersheads. Contact: Clay L. Pierce (515) 294-3159, cpierce@iastate.edu.

ILLINOIS REPORT
SPRING MEETING, MARCH 23 -24, 2004

DAM PROJECTS

Brewster Creek Dam Removal: The dam has been removed in phases and sediment movement has been monitored be USGS to see if the “gradual release” strategy causes any downstream problems. Only 18" of the dam remains to be removed and so far no downstream problems have been found. Although it has been a dry year, the lake sediments have been surprisingly stable. Plans are being made for restoration of the exposed area and getting fish past 2 other downstream barriers.

North Batavia Dam Removal: After many years of discussions, plans, public meetings, and campaigns by pro- and anti-dam groups, the Batavia City Council and Park District voted to remove the North Batavia Dam. Removal of this dam along with the South Batavia Dam (see below) will open up six miles of very good habitat on the Fox River for many native fish species including greater and river redhorse. INHS has a contract from OWR to study the effects of the dam removal over the next few years.

The South Batavia Dam Project: The South Batavia Dam has been under study for removal for several years. In the mean time, the island between the dam wings washed out. Plans and permits are being modified for the actual removal, which should occur in the coming year. There has been much concern about sediment release for this and other removal projects. Evaluation of this and other ongoing projects should provide useful information on downstream effect.

Hofmann Dam/Des Plaines 206 Project: After many years of study, the Corps is ready to complete the feasibility report, recommending notching of the Hofmann Dam and removal of the Fairbanks and Armitage Dam over a 10 mile stretch of the Des Plaines River. Public and municipal support for this project is very good. Removal of the dams will eliminate a significant safety hazard. However, recent Federal cuts may affect this and other 206 projects.

EXOTICS

Illinois Waterway Electric Barrier: For the last several years, the IDNR has been working in cooperation with the Army Corp of Engineers, Fish and Wildlife Service, City of Chicago and others (18-20 other groups or agencies) on the installation and monitoring of an electric barrier on the Chicago Sanitary and Ship Canal. The electric barrier is a temporary, experimental effort to impede the invasion of Asian carps (bighead and silver) from the Illinois Waterway System into Lake Michigan. In 2002, the electric barrier received funding to make it operational. However, this barrier is expected to complete its useful life in April of 2005. Some circuits have already failed, and obvious wear is noted on various components. Studies to monitor fish movements and to assess the barrier effectiveness are being conducted.

Because of the critical nature of this project and short expected life, the IDNR has partnered with the Army Corps of Engineers to build a second, permanent barrier in the canal. IDNR has reprogrammed $2.0 million from its Office of Water Resources budget and completed Project Cooperation Agreements to become the local project sponsor. While Barrier II is nearing the end of the design phase, contracts between USACE and the design / construction company are under development. Barrier II is expected to be operational by Fall of 2004, provided funding is available to keep construction on schedule.
In addition to restored funding, the Army Corps of Engineers needs authorization from Congress to make Barrier I permanent. Both of these actions could be completed by passage of the National Aquatic Invasive Species Act (NAISA). This project is being examined to determine its usefulness and viability in other basins, including the Mississippi River, St. Lawrence seaway, and Lake Champlain.

COMMERCIAL FISHING PROGRAM

Trophy Catfish Assessment: Entered our third year of sampling directed toward large flathead and blue catfish in the Mississippi River near Alton IL. We tagged a total of 77 flathead and 70 blue catfish during the 2003 sampling effort. Catches were down somewhat from recent years, due mainly to a later than usual warming of water temps during the sampling window. Anecdotal evidence gathered from commercial fishermen indicate that the spawning efforts from both blue and flathead catfish was delayed

about two weeks from what it has been the previous two years. While catches in terms of numbers were somewhat depressed, the size of the fish we saw was nothing short of incredible. In one single hoop net raise 13 blue catfish were collected with a total weight in excess of 420 pounds, the largest specimen in this set was a 53 inch fish that weighed close to 90 pounds.

Shovelnose Sturgeon Assessment (Wabash River): Continued working with commercial fishermen on the Wabash River. The delayed spring rains impacted sampling on the Wabash. A total of 7 trips were made resulting in 227 tagged shovelnose sturgeon. We are starting to collect some recaptures, although the overall recapture rate remains well below 5%. We have started to collaborate with students at Purdue University who are conducting shovelnose sturgeon research in the headwaters of the Wabash. They have already picked up two tagged shovelnose from our tagging efforts on the lower Wabash and will hopefully help us start to unravel some of the migratory habits of these fish.

Shovelnose Sturgeon Assessment (Mississippi River): Started to work with commercial fishermen in two different areas of the Mississippi to look at shovelnose sturgeon. Still learning collection techniques and hope to incorporate some of the methods the commercial fishermen are using into some form of a sampling program. Over the course of 4 days working at River Mile 190 we were able to collect length/weight data from 594 shovelnose, as well as 10 pallid and 2 lake sturgeon. The collection technique used was a drifting trammel net which was highly effective and more than a little exciting. We also worked with a group of commercial fishermen at River Mile 358. The technique employed here was stationary trammel nets that were set overnight. We managed to collect length/weight data from 1,159 shovelnose over the course of 2 days of sampling. Of these 830 were fitted with floy tags. Plans are to continue to develop sampling techniques that will be effective on the Mississippi and to supplement ongoing tagging efforts being conducted by the Missouri Department of Conservation, Southern Illinois at Carbondale and the Waterways Experiment Station of the Army Corps of Engineers.

FISH ADVISORIES

Sport Fish Consumption Advisories: New and updated advisories have been finalized for 2004 with a press release being issued by the Illinois Department of Public Health. The annual list includes a statewide mercury advisory for all predator species of fish. Sportfish advisories are in effect for a total of 26 rivers and streams and include contaminants such as PCBs and chlordane, in addition to the statewide mercury advisory for predator species. Sport Fish Advisories are published annually in the IDNR Fishing Information Booklet and are also posted on the IDPH website at: **www.idph.state.il.us.**

RIVERS PROGRAM: GENERAL PROJECT DESCRIPTION

Upper and Middle Mississippi River Projects:

Fish Community/Population Monitoring - Annual monitoring continued at 20 sites on the Upper Mississippi River, from R.M. 301-580. Electrofishing was done using D.C. exclusively this year.

Fish Community/Population Monitoring - 20 fixed site stations distributed between Lock & Dam 22 and Cairo were sampled in 2003. The stations are sampled annually during the summer (usually August and September) with A.C. (240V, 180Hz) boat electrofishing. Sampling is focused on collecting fish community samples. IDNR Mississippi River fish monitoring program began in the early 1970's.

Minnow seine sampling - We sample 40 stations distributed between LD 22 and Thebes, IL with a 20'x4'x1/8" bag seine in June, July and September. This is supplemental sampling to boat electrofishing samples and focuses on collecting young of the year fish samples and small fish community samples. Minnow seine sampling began in 1986.

Chevron Dike fisheries evaluation study - Chevron dikes were designed by St. Louis District COE (SLD) in collaboration with USFWS, MDC and IDNR, as river training structures and dredge material disposal areas. These structures have been constructed at 4 locations between LD 22 and Melvin Price Locks & Dam. Scour holes > 20' are typically created below the apex of structure. Dredge material placed within chevrons will eventually be formed into an island with a top elevation similar to that of the top of the rock in the chevron. We've sampled (A.C. boat electrofishing) two chevrons in Pool 24, above Louisiana, near Cottonwood Island (~RM 290), monthly from June through October since 1994. The area behind the structures provides quiet water habitat and fish assemblages observed there are similar to those observed in a contiguous backwater nearby. Fish assemblages observed along the outside of the structures are similar to those in a nearby side channel. A total of 45 fish species (4 exotics) have been collected inside, 32 (1 exotic) species outside.

Multiple Roundpoint Structure (MRPS) fisheries evaluation study - These structures were also designed by SLD as an environmental friendly substitute for emergent rock dikes. They consist of a series of six circular rock piles, approximately 50 ft apart aligned perpendicular to the shoreline. We've sampled the MRPS at Mississippi River mile 256.6L two to four times per year with A.C. boat electrofishing since 1998. A total of 24 fish species have been collected thus far. Collection of blue suckers, stonecats, river darter and slenderhead darter suggest these structures are providing a unique riffle-type habitat, once more common in the river than today.

Paddlefish sampling -This sampling is in conjunction with a basinwide (22 states) study of paddlefish under the auspices of the Mississippi Interstate Cooperative Resources Association (MICRA). The study began in 1995 and continues today. The study's intent is to obtain basin population estimates, estimates of exploitation rates and information on movement. MICRA asked each state to collect and tag {coded wire tag [CWT]} at least 300 paddlefish/yr. From 1995 through 2002 we've collected and tagged 1948 paddlefish, 33 of which were recaptures, using a variety of entanglement nets (trammel, gill, hobbled gill – 3.5 to 5 inch mesh). Our study area includes Mississippi River Pool 26 and Swan Lake on the lower Illinois River. Sampling in Pool 26 typically occurs Oct – Mar, while Swan Lake sampling usually occurs in May – July. We've observed movements of < one river mile to > 500 miles. Part of the project is to ask commercial fishermen to help by saving rostrums from harvested fish for us to 'wand' (check for CWT).

Ohio - Wabash River Project:

Shovelnose Sturgeon Population Study - Evaluation of the shovelnose sturgeon in the Wabash River continued. We are starting to piece together some of the movement patterns of these fish and are finding out they are highly migratory. We recaptured one shovelnose 173 miles upstream from where it was tagged and two Illinois tagged fish were collected by Purdue University another 112 miles farther upstream.

Sauger Survey Ohio River - The sixth year of the coordinated Ohio River Fisheries Management Team survey provided more information on Ohio River sauger stocks. Floy tag returns indicate movement by sauger upstream through 3 dams with the majority of the returns coming from the Newburgh Dam 63 miles upstream from tagging location.

Back Bass Study Ohio River - The third year of the coordinated Ohio River Fisheries Management Team study revealed additional information on the black bass population through out the 930 miles of the Ohio River.

Paddlefish Study Ohio River - The paddlefish study for MICRA and the ORFMT continues on the Ohio River and it's tributaries. Over 430 paddlefish were collected and tagged last year from the Ohio and Wabash Rivers. Paddlefish tagged by Illinois biologist from the Ohio have been recaptured above

Louisville Kentucky, in the head waters of Kentucky Lake., Hovey Lake in Indiana and from the lower portion of the Illinois River.

Illinois River Project:

Restoration of the Illinois River Basin: *Cooperative Project with US Army Corps of Engineers*

The Illinois River has long been an important environmental and economic resource to the State of Illinois and the nation as a whole. This importance led Congress to recognize the Illinois River as part of the Upper Mississippi River System as a unique nationally significant ecosystem and a nationally significant commercial navigation system in Section 1103 of WRDA 1986. Also, the National Research Council identified the Illinois River as a nationally significant, floodplain river with excellent prospects for restoration.

The State of Illinois also recognizes the important resource that the Illinois River Basin represents. The Offices of the Governor and Lt. Governor have led efforts to focus attention on the Illinois River, including completing an *Integrated Management Plan for the Illinois River Watershed* and proposing "Illinois Rivers 2020" a $2.5 billion, 20-year State and Federal initiative to restore the Illinois River. The State of Illinois has committed itself to restoration activities in the basin by leading planning efforts and enacting legislation aimed at basin restoration. The State has supported restoration efforts through the most successful Conservation Reserve Enhancement Program in the Nation and numerous locally led watershed-planning initiatives. In addition, local groups strongly support and have been active in pursuing restoration in the basin.

> Development of a comprehensive plan and initiating critical restoration projects described in this Project Management Plan (PMP) was completed in 2003 for Section 519 of WRDA 2000. The purpose of the comprehensive plan is to identify restoration needs within the basin in a manner consistent with Federal planning requirements and Congressional authority. The ongoing Illinois River Ecosystem Restoration Feasibility Study effort will identify problems and opportunities, define existing and future without conditions in the Basin, develop a consensus based desired future condition and evaluate the need for restoration, document resource significance, formulate alternatives at the system level to determine Federal interest and level of effort required, and develop a restoration program and prioritization process.

Section 519 funding is being used to conduct the activities described in this document including addressing comprehensive plan requirements from that legislation including: (1) the development and implementation of a program for sediment removal technology, sediment characterization, sediment transport, and beneficial uses of sediment; (2) the development and implementation of a program for the planning, conservation, evaluation, and construction of measures for fish and wildlife habitat conservation and rehabilitation, and stabilization and enhancement of land and water resources in the basin; (3) the development and implementation of a long-term resource monitoring program; (4) the development and implementation of a computerized inventory and analysis system; (5) summarization of Illinois River transportation and economic information; and (6) improvement in planning tools for watershed assessments, characterizing ecosystem project benefits restoration techniques.

In 2003, the six critical restoration projects identified through the Illinois River Ecosystem Restoration Study were initiated under Section 519 in 2003. These efforts (Waubonsie Creek, Blackberry Creek, Kankakee and Iroquois Rivers, McKee Creek, and Pekin Lake were identified by the Illinois Department of Natural Resources through a basin-wide evaluation process, represent a range of project

types addressing the major system problems, and have local interest and support. Only one project, Pekin Lake has progressed to completion of feasibility in 2003 partially due to funding levels.

SPORT FISH RESTORATION PROJECT (Federal Aid Project)

Background: The Sport Fish Restoration Project (Federal Aid Project F-67-R) includes activities on Boundary Rivers (Mississippi, Ohio and Wabash Rivers), large rivers (Illinois River) and wadeable streams. These activities involve Fish Population Surveys, Intensive Basin Surveys, Biological Stream Characterization, Annual Surveys (Trends), Habitat Improvements, Contaminant Sampling, and Sport Fish Management. Illinois is currently in it's 18th segment (year) of the project. Total costs annually for this project was $698,293 in FY '03.

F-67-R Studies:

1. Study 101 - Baseline Data Collection
a. Rotational Basin Surveys and Reports (Coordinated with the Illinois EPA)
b. Targeted Surveys
c. Index of Biotic Integrity(IBI) and Biological Stream Characterization (BSC)

2. Study 102 - Annual Stream Monitoring
   a. Electrofishing sites on Mississippi, Ohio, Wabash and Illinois Rivers plus minnow seining sites on the Mississippi River
   b. Sport Fish Summary Reports
   c. Sport Fish Contaminant Sampling for Consumption Advisories on Streams

3. Study 103 - Stream Management Investigations
   a. Special surveys and assessments on streams receiving stocked fish.
   b. Big River Habitat Improvement Projects
   c. Wadeable Stream Habitat Improvement Projects
   d. Harvest Regulation Assessments

4. Study 104 - Conservation 2000 Watersheds
   a. Technical guidance
   b. Review of stream habitat projects

Accomplishments in FY '03:

Study 101 - Baseline Data Collection

I. Basin Surveys: Fish samples were collected from 131 sites in 6 stream basins including the Pecatonica River Basin (11 sites), LaMoine River (21 sites), Fox River Basin (16 sites), Upper Kaskaskia River Basin (17 sites), Lower Kaskaskia River Basin (44 sites), and the Little Wabash River Basin (22 sites).

II. Targeted Surveys: Collected fish from 62 sites on 30 streams, including Kinnickinnick Creek, Kickapoo Creek (Wildlife Prairie State Park), Kent Creek, Big Rock Creek, Welsh Creek, East Branch Big Rock Creek, West Branch Big Rock Creek, Little Rock Creek, Poplar Creek, Winfield Creek, Indian Creek, Buffalo Creek, McDonald Creek, Brewster Creek, Hurricane Creek, Kickapoo Creek, Stevens Creek, Tipton Wetlands, Riley Creek, Brouilletts Creek, Frog Alley, Bray Creek, Henline Creek, Sugar Creek, Mud Creek, Saline Branch Ditch, Jordan

Creek, North Fork Vermilion River, Middle Fork Vermilion River, Salt Fork of the Vermilion River.

III. Data from 148 samples were uploaded onto the statewide Fisheries Analysis System (FAS)-Streams database for development of Biological Stream Characterization (BSC) ratings. These data included samples from the following river basin surveys: Mackinaw River, Spoon River, Apple River, Little Wabash River, Vermilion River (Wabash Drainage), Green River, and Middle Illinois River Tributaries. A total of 822 Index of Biotic Integrity (IBI) scores, derived from fish samples collected from 1994 through sampling year 2000, were compiled and linked to an Illinois EPA coverage of station locations.

Study 102 - Annual Stream Monitoring

IV. Staff collected fish population samples from 21 sites on the Illinois River via AC electrofishing. Conversion to DC electrofishing is expected to follow the path of the Mississippi River as soon as the necessary equipment is purchased by the DNR.

V. Electrofishing was conducted at 12 sites on the Wabash River, 19 sites on the Ohio River, and 39 sites on the Mississippi River, August through November. At the Ohio River sites and 20 sites on the Mississippi River, collections were made with DC as a gradual shift to pulsed DC electrofishing is made, from the 3 phase AC employed at the remaining sites. A 2001 report indicated the shift could be made without losing the comparability of the data collected since 1976.

VI. Fish contaminant samples were collected from 48 sites on rivers and streams.

Study 103 - Stream Management Investigations

VII. Three special surveys on streams receiving stocked fish were completed. This includes surveys conducted on the Rock River (1 site) for walleye, Kankakee River (2 sites) for walleye, and the Vermilion River (Illinois River Drainage) (2 sites) for smallmouth bass. An additional two sport fish surveys were conducted on the Rock River (8 sites) for smallmouth bass, and the Illinois River (5 sites) for flathead catfish, channel catfish (including a fall survey for additional sport fish).

VIII. Monthly electrofishing was completed, May through October, of river training structures in Pool 24, RM 290, (chevron dikes) and Pool 25, RM 256.6, (multiple round points) Mississippi River which had been placed by the Army Corps of Engineers to provide possible fish habitat benefits as well as river training function.

IX. The paddlefish investigations designed to assess the possible need for harvest restrictions continued with netting in the winter months and early spring on the Wabash (RM 25-52), Ohio Smithland Pool (RM 847-918), Mississippi (RM 180-220). MICRA paddlefish tagging project yielded 54 tagged paddlefish as well as three lake sturgeon. Over 100 paddlefish from the Wabash and Ohio Rivers were netted and tagged. Seven were recaptures from previous years.

X. Interest by sport fishermen has prompted investigations to assess the need for better protection of certain "trophy" fisheries of large catfish. Fish collections for the flathead catfish stock assessment and telemetry investigations in Pool 16 of the Mississippi, RM 457.2-482.9 were completed in 2003.

XI. Blue and flathead catfish collections for population structure and tagging were conducted in Pool 26 on the Mississippi using trammel nets in February and hoop nets during May. Length frequency data were gathered on 83 flatheads and 117 blues tagged. One of the blue catfish tagged in February was taken by a sport fisherman in June over 200 miles from the tagging site.

A hoop netting survey for flathead and blue catfish in the Mississippi River was conducted. Cool water temps delayed spawning this spring, resulting in reduced catch rates. While overall numbers of fish collected were down, the size of fish collected was not. There were many fish in the 50 lb. class, as well as one potential state record blue catfish measuring 53 inches and weighing in excess of 82 pounds.

XII. Spring and fall sauger electrofishing surveys were completed on the Ohio River, below J.T. Meyers Dam, RM 846-847, as part of a larger multi-state effort designed to assess management needs to improve the population.

XIII. Night electrofishing surveys for black bass in the Smithland Pool of the Ohio River were conducted in October and November as part of a multi-state management investigation. Population structure data were gathered from 382 largemouth and 212 spotted bass.

XIV. The Wabash River sturgeon electrofishing study report for 2002 was compiled. Over 600 sturgeon were captured and tagged last year. More than 1000 sturgeon have been tagged over the last 3 years by electrofishing. Nine fish were recaptured. Catch rates have gone up with DC electrofishing, but AC rates have decreased over the period. Length frequencies and stock densities have remained fairly constant from 2000 through 2002.

The third year of a shovelnose sturgeon tagging and recapture investigation on the Wabash River was completed in 2003. A total of 123 sturgeon was sampled with commercial fishermen on the Wabash River. Sturgeon sampled were returned to the river after tagging in an effort to determine population densities. Three recaptures were collected from previous tagging efforts. Several hundred sturgeon have been tagged to date.

XV. Staff has worked with the St. Louis District, US Army Corps of Engineers to develop a micro-model of a proposed project to construct an island and side channel habitat. Placement of a chevron dike and modifying existing dykes are predicted by the model to build an island behind the chevron. The St. Louis District has pioneered the use of micromodels, which are table sized scale models of 5-10 miles of river. The models allow an accurate assessment of various structural alternatives for improving navigation and riverine habitat conditions.

XVI. Staff is also working with the three Upper Mississippi River Corps of Engineer Districts (St. Louis, Rock Island and St. Paul), USFWS, USGS, MDC, WI DNR, and MN DNR, under the guidance of Dr. Luther Aadland, has been constructing fish bypasses over some of their dams on smaller streams that show great promise for use at UMRS dams.

XVII. The Wisconsin Large River IBI was adapted by the Illinois Natural History Survey staff for Illinois conditions and computerized such that a river IBI for Illinois rivers could be utilized and evaluated.

XVIII. Shovelnose sturgeon were sampled on the Mississippi River at Chain of Rocks. Four drifts with a trammel net yielded 87 shovelnose and three pallid sturgeon.

XIX. The mussel population of Bath Chute on the Illinois River was sampled for commercial species. Twelve (12) species on mussels were sampled including some impressive washboard mussels.

XX. The Ohio River fall community survey was completed. Grass carp, silver carp, and bighead carp were collected in larger numbers than in previous years. Three (3) young-of-the-year silver carp were collected for the first time at the mouth of the Post Creek Cut-off on the lower Ohio River.

XXI. Three investigations for assessment of harvest regulations were conducted on streams. This includes investigations of new smallmouth bass regulations on the Kankakee River at Langam Island, new smallmouth regulations on the Kankakee River near Momence, IL., and a survey flathead and channel catfish on the Sangamon River.

Study 104 - C2000 Watersheds

XXII. Technical guidance was provided to 19 C2000 Partnerships. Technical guidance and assistance provided included information regarding sport fisheries, species distribution, restoration practices, review of watershed plans, on-site inspections of stream restoration projects, and attendance at local meetings. A total of 114 of these technical assistance activities were conducted statewide.

XXIII. There are a total of 39 Ecosystem Partnerships now formally established in Illinois. The 19 Ecosystem Partnerships assisted included: Vermilion Watershed Partnership (#39), Spoon River Partnership (Court Creek) (#30), Upper Des Plaines Partnership (#33), North Branch Chicago River Partnership (#25), Chicago Wilderness Partnership (#5), Du Page River Partnership (#7), Lower Des Plaines River Partnership (#19), Thorn Creek Partnership (#32), Prairie Parklands Partnership (#26), Vermilion Partnership (#38), Upper Salt Creek of the Sangamon River Partnership (#37), Kaskaskia River Partnership (#14), Kankakee River Partnership (#13), American Bottoms Partnership (#1), Big Rivers Partnership (#2), Sinkhole Plains Partnership (#29), and the LaMoine River Partnership (#18), Shawnee Partnership (#28), and the Cache Partnership (#3).

1. A total of 11 habitat projects were reviewed and/or developed with C2000 Partnerships.

Michigan Chapter Report

1. Todd Wills, MDNR Research Biologist, took over as chair of the Rivers and Streams Committee for 2004.

2. Due to current state of Michigan travel restrictions, the committee has been somewhat inactive with the NCD as of late. Hopefully the travel restrictions will improve.

3. The most recent activity of the Rivers and Streams committee within the Chapter is the following of the Michigan Drain Code Reform Bills. Senate Bill 0217 and House Bill 4552, which amend the Michigan drain code of 1956, are currently stalled in the legislature.

4. At the request of the Chapter membership, the Rivers and Streams Committee is currently working with the Continuing Education Committee to sponsor a fluvial geomorphology course for the fall of 2004.

5. An effort will be initiated in the near future to solicit new membership and reaffirm current membership on the Rivers and Streams Committee in an effort to increase activity. The next committee meeting will be scheduled in conjuction with the 2005 Michigan Chapter meeting.

Minnesota Summary of Activities on Streams and Rivers For 2004 NCD Rivers and Streams Technical Committee

MN Chapter of the AFS

A Chapter Rivers and Stream ad hoc committee has been reformed. The first project was to create a position paper on timber harvest guidelines. We felt the current statewide guidelines didn't offer sufficient protection for riparian areas so two members wrote a draft position paper that went through a review process and was approved at last weeks annual meeting. Other issues they have identified as priorities are: promoting proper culvert design and installation for fish passage and stream stability, facilitating stream geomorphology training, generating research ideas and discussing snag removal guidelines.

DNR Fisheries

Federal Aid Projects

Federal aid dollars are not currently being used to get Federal Aid Reimbursement for trout stream habitat work. The DNR is already doing more work in other areas than required for the maximum match, so they discontinued the reporting of these projects. Instead, trout stream projects are funded with dollars from the trout stamp program. Most of the money is being spent on traditional habitat improvement projects in the trout streams in SE MN. Additionally, there are several ongoing beaver removal projects across the state. Warming from beaver dams and inhibition of migration during times of thermal stress are the main concerns.

The most common habitat improvement project being done in the state is typically bank stabilization combined with lunker structure placement. Over the past few years about 10 miles per year have being actively managed.

Federal Aid reimbursement dollars are being used to purchase angler easements.

Stream Survey Manual

The DNR Fisheries is in the final stages of creating a new stream survey manual. The biggest change from our old protocol is to incorporate new habitat measurement techniques. Rosgen's geomorphology based classification methodology will be incorporated statewide for the habitat

portion of the survey. There also will be sections on IBI analysis of fish and invertebrates as well as monitoring water quality. A standard protocol for fish sampling and site selection will also be included. A computer data base program will be written to compile all statewide stream data.

GIS

Currently working on stream layers that apply Kittle (identification) numbers to all the streams in the state. We are beginning with only streams managed by Fisheries. This project should be completed in 1 – 2 years.

Stream Restoration

The SE MN Trout Stream crew is working on a realignment and trout habitat improvement project on Mill Creek in Olmstead and Fillmore Counties. The project will use principles of natural channel design to restore a stable functioning stream channel. The project includes about 1 mile of the stream. The City of Chatfield will also be working on stormwater management in the watershed to improve water quality. This project will hopefully help to begin the process of comparing the natural stream channel design methodology to traditional habitat improvement structures.

DNR Ecological Services

Stream Restoration Prioritization List

The goal of this project is to list all the stream restoration (including dam removal and modification) projects in the state that Ecological Services has been requested to do and to create a method for prioritization. Currently there are 59 projects completed, in progress or proposed on the list. The projects on this list are ones designated for restoration using natural channel design methodology (geomorphology), not traditional habitat improvement methods (structures). A break down of these projects include: Dam conversions to riffles/rapids - 13 completed/11 proposed, Dam removals with channel restoration – 6 completed/4 proposed, Fish passage (barrier removal and bypass channels around dams) – 4 completed/8 proposed, Habitat improvement – 2 completed/1 proposed, Stream Restoration – 11 completed/9 proposed. On the main stem of the Red River of the North, in NW Minnesota, only 3 dams remain as barriers to fish movement.

Training

DNR Ecogical Services is now offering three courses in stream geomorphology. The introductory course is a week long and is offered annually. In addition, in alternate years they offer week long classes in monitoring and in stream restoration.

IFIM

DNR Ecogical Services is involved in several aspects of Instream Flow monitoring. They are monitoring 4 different long-term sites for the reliability of Habitat Suitability Index modeling. They are also conducting 2 dimensional hydraulic modeling on the Rainy river to be used for H S I modeling below the dam to assess habitat changes with changes in flow.

Watershed Spreadsheet

Eco services is working on a GIS template on watershed management to be distributed to all people working on watershed projects. It would include a geomorphic spreadsheet to include the 5 components that should be considered when analyzing a watershed (geomorphology, hydrology, biology, water quality and energy pathways/connectivity). The idea being to make sure that watershed managers fully understand the cause of the problem and try to treat the cause rather than the symptoms.

Interactive River Video

"Healthy Rivers: A Water Course" is a dynamic CD-ROM program that explores the ecology and management of river systems. Produced by the Minnesota DNR Division of Ecological Services, expertise was synthesized from a team of interdisciplinary scientists, resource managers, and multimedia specialists to present this engaging inquiry of our relationship to rivers and streams.

The user-friendly program organizes information around a logical, five-component framework for understanding complicated principles of river and stream ecology. Case studies examine the history of river use and provide a basis for a future vision of water resource management. A section exploring the value of river system goods and services leads to inspiring examples of local leaders and practical, action-oriented ideas for next steps. A complete bibliography complements additional references and resources for further study.

"Healthy Rivers" is intended for adult citizens working with conservation and watershed organizations on river management issues; land management agencies, local governments, environmental consultants, and policy makers working towards sustainable management of our river and stream resources; and secondary and post secondary educators.

Waters

General Permits - Waters is in the final stages of developing a general permit to be used by the state Dept of Transportation for stream and river crossings. There are general permits for most counties in the state. It eliminates the need for the engineers to apply for a permit on every project. Instead, the DOT or counties provide the local hydrologist and Fisheries manager a list of crossings that are proposed and the hydrologists and fish manager can decide if further discussion is necessary. Many new requirements should benefit the streams and better help to maintain stable streams. New requirements include; matching the slope of the stream, burying culverts below the streambed, offsetting multiple culverts, extending culverts through the toe of the slope and aligning the culverts with the stream. To deviate from any of these requires a separate permit. There are also limitations on the dates when the work can be done and velocities allowed in a 2 year storm event. Negotiations are ongoing to require that culvert widths also match bank full stream widths.

Arrowhead Regional Stream Team

In 2002, an interagency group was formed between state (DNR Waters and Fisheries, Pollution Control Agency, Dept. of Transportation), tribal (Fond du Lac Tribe and 1854 Authority), county (Itasca and St. Louis) and federal (USACE, USFW) agencies with the goal of providing geomorphic and hydrologic technical assistance and training within the arrowhead region of

north eastern Minnesota. This team was formed because there was a recognized shortage of comprehensive understanding and knowledge of geomorphic principles in this area.

The main goal is to have a core group of members of the stream team trained in advanced geomorphology and stream restoration techniques, so they can offer assistance and training for all the agencies and local governments in the area. By using a multi-agency approach, the workload of the team is spread among the various participants and each individual agency would have an expert their agency could refer to.

Other goals besides training of the core stream team members include: develop and advance stream crossing recommendations, provide technical assistance on stream restoration and protection projects, development of a program to collect baseline data and development of regional curves, and develop a methodology for mitigation of stream degradation and the creation of a stream restoration bank similar to those used for wetland mitigation.

Stream and wetland mitigation

One of the goals for which the most progress has been made is the development of a methodology for mitigation for stream degradation. The goal is to develop a methodology that would allow treatment of streams similar to the way wetlands are handled, thus allowing the option of stream restoration to be completed in lieu of traditional wetland mitigation in some cases. Currently, the DNR Division of Waters regulates activities in streams and has no mitigation requirements similar to wetlands mitigation requirements. Sandy Verry, a research hydrologist recently retired from the USFS North Central Experimental Station has proposed a methodology for rating streams that is similar to Minnesota's current functional analysis used in wetlands. It is a system based on quantitative analysis that ultimately gives a score of 1 – 100 related to the stream's stability (Rosgen definition). Currently, a subcommittee of the stream team is reviewing the paper and working with the states Interagency Wetland Group to determine how to best advance this methodology.

Nebraska Chapter Rivers and Streams Activities - Spring 2004

University of Nebraska-Lincoln

Ecology and management of pallid sturgeon and sturgeon chub in the lower Platte River, Nebraska.

This study's goal is to quantitatively describe habitat use by pallid sturgeon and sturgeon chub in the lower Platte River. In addition, this study will include an analysis of the ecological relationships among sturgeon species and other fish species typical of shifting sand-bed rivers, exemplified by the Platte River.

These studies are focusing on the following objectives.

1). Document habitat use, relative habitat preference, and species assemblages associated with adult and juvenile pallid sturgeon and sturgeon chub in the lower Platte River.

2). Document the phenology, and relative abundance of larval recruitment for pallid sturgeon, sturgeon chub and associated species in the lower Platte River.

3). Determine how changes in river discharge influence habitat use by pallid sturgeon and sturgeon chub life history stages in the lower Platte River.

4). Document the catch of sturgeon by anglers in the lower Platte River.

5). Develop educational materials and management recommendations for the sturgeon fishery in the lower Platte River.

Sturgeon Sampling Approach (Objective 1):

Intensive sampling commenced in May 2001 and is scheduled to continue through July, 2004 at sites near Two Rivers, Ashland, Louisville, and Plattsmouth, Nebraska. Fish are being sampled using a combination of trot lines, drifted trammel nets, stationary gill nets, trawls, and seines to sample sturgeon and associated species from as wide a range of habitats as possible. Trammel nets are drifted in areas along sand bars that have been identified in current research (Snook 2001) to be important habitats for pallid sturgeon. Trotlines baited with night crawlers are fished during colder water months. Benthic fish trawls are also used to sample deeper run and pool habitats for sturgeon and associated species.

All sturgeon captured are identified using aids such as the Morphometric Character Index (Sheehan et al. 1999), measured (fork length) and weighed. Samples of fin rays or barbels are being collected as voucher specimens for DNA analysis to confirm Morphometric Character Index identifications. Sturgeon large enough to accept the individual radio telemetry or combined radio and sonic telemetry tags are implanted in the field and all sturgeon are tagged with PIT tags so that we can identify them if captured at a later date.

Radio and ultrasonic tagged fish are being monitored, throughout the year, from shore, boat, and aircraft to determine their location. After each fish is located, a Global Positioning System (GPS) unit is used to determine its position. In addition, distances from shorelines and prominent features along the river are measured using a range finder. These recorded locations are being used to determine movement patterns of tagged fish within the river over the 400 to 600+ day, life of the transmitter.

To describe the area used by a telemetry tagged sturgeon, measurements of the habitat, including water depth, mean column velocity, bottom velocity, substrate, and cover, are made at the focal point of the radio signal location and then, three meters upstream, three meters downstream, three meters to the left and three meters to the right of the focal location (Hofpar 1997, and Snook 2001). In addition, single measurements of dissolved oxygen, water temperature, conductivity, and suspended solids are made at each location. This protocol is consistent with

those used by similar studies in Montana (Bramblet 1996) and Illinois (Hurley 1998).

Since adult pallid sturgeon are known to be piscivorous, standard seine hauls or other suitable collection techniques are used to sample fish assemblages in the vicinity of each telemetry tagged sturgeon's location. This allows us to determine their association with other fish species.

To attempt to build a more complete picture of potential sturgeon habitat in the Platte River we are also sampling locations with similar appearing conditions, which have no known sturgeon present using gill nets, seines, and trawls. These collections will be used to evaluate concordance of habitat conditions with potential food sources. Habitat use and preference criteria will be developed from this data set following methods recommended by Bovee (1986), Yu (1996),Yu, et al. (1995) and Yu and Peters (1997). Preference will be determined by evaluating use in relation to availability of each habitat parameter. Availability of habitat are being estimated from PHABSIM calculations on data collected by the Nebraska Game and Parks Commission. GIS-based habitat availability models are also being developed.

Project Highlights to date:

From 2001-2003, three pallid sturgeons, all presumed to be wild fish, were captured and fitted with PIT tags and radio transmitters. Seven more pallid sturgeon have been captured so far this year from the Platte River! Five of them have been fitted with transmitters.

Over 500 shovelnose sturgeon have been captured and fitted with PIT tags throughout the lower Platte. Recently, a sturgeon believed to be hybrid shovelnose x pallid cross was captured and implanted with a radio transmitter. We are awaiting the results of genetic tests from a fin clip of the fish for confirmation.

Since 1998, we have collected nine sturgeon (*Scaphirhynchus spp*.) larva. However, all are too young to identify to species. Over 8,000 chub (*Macrhybopsis spp*.) larvae have been collected to date. In addition, we have collected 95 blue sucker (*Cycleptus elongatus*) larvae.

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Nebraska Game & Parks Commission, Rivers and Streams Program

1). Working on an agency level effort to develop a Comprehensive Wildlife Conservation Plan as part of the Nebraska Natural Heritage Legacy Project (formerly CARA). Rivers and streams inventory work includes:
   a). The Statewide Stream Fishery Survey (see below)
   b). A survey of the mollusks, primarily mussels, of selected watersheds.

2). Fishways
   a). Will be collecting and tagging channel catfish in North Platte River in an evaluation of the Belmont Diversion Fishway (near Bridgeport).
   b). Working with Sargent Irrigation District to build a supplemental spillway through the Milburn Dam which will include a nature-like fishway designed to pass channel catfish.
   c). Have contracted with Civil Engineering department at the University of Nebraska-Lincoln to design a fishway for the Spalding Dam on the Cedar River.
   d). Have partially completed a survey of the Middle Loup River above the Milburn Dam to evaluate a year 2000 stocking of fingerling channel catfish.
   e). Are working with City of Fairbury and US Army Corps of Engineers on a dam replacement/fishway project on the Little Blue River.

3). Mosquitofish
   a). Are working with University of Nebraska at Kearney to do a study of interactions of introduced mosquitofish and native plains topminnow in a long term effort to look for ways to control mosquitofish.

4). Databases
   a). Have built and continue to maintain databases on statewide collections of fish, mussels, and crayfish. The databases are frequently used to supply information to a variety of entities desiring information on the biota of streams and rivers.

5). Aquatic Nuisance Species
   a). Involved at several levels on ANS management/information campaigns with particular regard to zebra mussels and asian carps.

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Nebraska's Statewide Stream Fisheries Inventory

The Nebraska Statewide Stream Fisheries Inventory is a cooperative and comprehensive venture sponsored by the University of Nebraska-Lincoln, School of Natural Resources and the Nebraska Game and Parks Commission (NGPC). This project is designed to inventory Nebraska's streams across all 13 major river basins to update the 1939-42 Raymond Johnson survey.

Data were gathered following the Environmental Protection Agency's Environmental Monitoring and Assessment Program-Surface Waters. Sampling during 2003 was primarily in the southeast and southwestern parts of the state as well as Verdigre Creek in Knox county, Cherry county, and the Panhandle. Data were collected on fish, aquatic invertebrates, discharge, and various other physical and chemical parameters at 56 sites from May through August. A total of 51 fish species and 46 genera of aquatic invertebrates have been identified to date.

Completion of the project will require the sampling of 167 sites during the summer of 2004. This information when combined with historical records will help to determine the level of anthropogenic change that has occurred over the last 60+ years in Nebraska's streams.

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Submitted by Mike Kaminski

American Fisheries Society – Southern Ontario Chapter Review 2003

The Middle Grand River Chapter of Trout Unlimited – Canada was formed in May 2003. The chapter's conservation focus for 2004 will be on cold water habitat improvement to spawning and rearing tributaries of the Middle Grand River system. Planned projects for 2004 include stream rehabilitation, dam removal, spawning surveys and temperature monitoring.

Credit Valley Conservation, one of Ontario's leading conservation authorities completed the third year of its Upper Credit River Restoration Initiative (UCRRI) in 2003. The UCCRI represented a systematic approach to rehabilitating brook trout habitat from the headwaters in Orangeville to south of Alton.

Project highlights include the use of brush to stabilize and trap more sediment in strategic areas along the river, in order to build new banks and narrow the river to speed flow, sort substrates, and to provide valuable nursery habitat. Thalweg clearing was done below Melville; woody cover was added to reduce erosion in a few barren reaches of the Sauriol and Trout Club reaches. Riffle structures and rock placement opportunities were limited as previous works had concentrated on these successful techniques. More than 1500 trees were planted on six properties.

In the four years the project has run, it has set the stage for major regeneration of native brook trout in the 14 km stream from old highway 24 upstream to Orangeville. The project demonstrated the value of a strategically designed rehabilitation project and the importance of partnerships in implementing an aggressive large-scale project.

The Greg Clark Chapter of Trout Unlimited – Canada has acquired a small grant from the Ontario Ministry of Natural Resources to initiate development of a Phase II of the Upper Credit River Rehabilitation Initiative.

Volunteer workdays were carried out in 2003 including the annual river cleanup on the Sligo Bridge reach, additional tree planting for the UCRRI program, and a bank bioengineering project downstream of the Grange Sideroad. In the past two years more than 330 volunteers contributed over 1500 hours to complete projects including: tree planting (10 000 trees covering more than 3 km of stream edge), fish habitat improvement (including lunker construction, riffle structures, sweepers, spring structures, and rock placement), and other stream restoration projects.

Ontario's Minister of Natural Resources, Jerry Ouellette, presented the 2003 Roderick Haig-Brown Award to Credit Valley Conservation and members of the Upper Credit River Rehabilitation Initiative. The award recognizes the "Outstanding Achievements in Fish Habitat Conservation" of the partners in the initiative.

The Humber River, largest of the streams that enter Lake Ontario through the city of Toronto provides valuable cold water habitat for trout on more than thirty kilometers of the main Humber above Bolton and hundreds more kilometers in its feeder creeks. The upper watershed has considerable, if fragmented, forest cover and woody cover grows on about half of the riverbanks. Native brook trout, introduced self-reproducing brown trout, and other cold-water fishes inhabit the upper main Humber. The entire upper Humber system is under threat from residential and other development pressures associated with urban sprawl in the outer reached of the Greater Toronto Area.

The Humber River Chapter of Trout Unlimited – Canada (TUC) has developed goals to establish TUC's cold water conservation presence on the upper main Humber and to work cooperatively with local and other groups and agencies concerned for the health of the watershed. Short term and long term enhancement of trout habitat, including tree planting in riparian areas, instream cover and other devices and the long-run removal of dams and barriers.

As part of a $1.5 million Great Lakes Revitalization Superproject announced by Environment Canada on March 15, 2004, three projects studying restoration of land on and around the Humber River banks have

been initiated. The projects will include riparian plantings, mitigation of barriers to fish migration, water quality analysis, and improvements to cold water habitats for resident and migratory fish.
The improvements are the product of the International Canada-U.S. Great Lakes Water Quality Agreement.

The Ontario Ministry of Natural Resources is in the process of finalizing a comprehensive study evaluating the response of landscape disturbance on catchment areas. Over 1200 sites were sampled in the Lake Ontario region for fish, habitat and invertebrates. The information will be used to establish regional models for Lake Ontario. The dataset will also be used to provide a preliminary classification of the degree of disturbance (or state of the resource) for the Lake Ontario basin.

Also nearing completion is a groundwater flow accumulation model for Lake Ontario that will provide an accurate depiction of the groundwater flow patterns across the Oak Ridges Moraine.

Submitted: March 31, 2004
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AFS NCD Rivers and Streams Technical Committee
Wisconsin Chapter Report
March 23, 2004

Wisconsin Department of Natural Resources

Title: Effects of flow regulation and restriction of passage due to hydroelectric power operation on the structure of fish and invertebrate communities in Wisconsin's large river systems. Contact person: John Lyons, John.Lyons@dnr.state.wi.us

Study objectives: 1. Examine longitudinal trends in fish and invertebrate community structure and the discontinuities imposed by flow regulation and restriction of passage due to hydroelectric project operation, and compare fish and invertebrate communities between selected river segments with varying degrees of flow regulation and passage restriction (Phase I). 2. Compare fish and invertebrate communities in river reaches subjected to daily peaking flow regulation with the same communities in the same reaches after minimum flows have been increased on several reaches and run-of-the-river flow regulation has been restored on the other reaches (Phase II). 3. Develop preliminary biotic indices to assess ecosystem integrity in large warmwater rivers in the upper midwest. Three reports will constitute the final report for Phase I of this project. The first, which will focus on Objective 1, will be a Masters Thesis prepared by Randall Piette for the University of Wisconsin – Stevens Point, and is due to be completed by June 2004. The second, dealing with the "pre" period of Objective 2, will be an internal WDNR progress report that will also be completed by June 2004. The third, which addresses Objective 3, is a manuscript: Lyons, J., R. R. Piette, and K. W. Niermeyer. 2001. Development, validation, and application of a fish-based index of biotic integrity for Wisconsin's large warmwater rivers. Transactions of the American Fisheries Society 130:1077-1094.

Title: Rewrite the book *FISHES OF WISCONSIN*. Contact person: John Lyons, John.Lyons@dnr.state.wi.us

Study objectives: 1. Completely rewrite and update the book *Fishes of Wisconsin*, including all relevant information compiled on Wisconsin fishes since the 1970s. 2. Make available data from the book in electronic format, either via CD (or another electronic medium) or the web. Substantial progress has been made. An outline and format for the book has been developed, and a team has been assembled to write the various chapters. This team includes 15 people from within the Wisconsin DNR and from various universities and federal agencies. Drafts of eight chapters are done and have been distributed to the team. Most of the workload in 2002-2003 has focused on developing a photographic-based fish identification system for the book. This is being done in cooperation with the University of Wisconsin Center for Limnology and the University of Wisconsin Sea Grant Program. The identification system will first be produced as a web-site and then will be converted to a cd format for inclusion in the book. A full-time post-doctoral associate, Kyle Piller, was hired through the Center for Limnology to work on this study; he has completed his duties and moved on to permanent faculty position at Southeastern Louisiana State University but will continue to participate in the project. Nearly all of the necessary photos have been taken, and they are in the process of being selected and attributed for the website. The web site is functional (URL: 144.92.62.239/newfishtest/), but many thousands of photos remain to be added, and layout and graphic art changes will be made before the site is complete.

Title: Status and trends in sportfish populations of southwester Wisconsin warmwater streams. Contact person: John Lyons, John.Lyons@dnr.state.wi.us

Study objective: 1. Monitor sportfish abundance, reproductive success, size structure, and growth rate each year in seven streams in southwestern Wisconsin, continuing annual surveys begin in 1989. 2. Maintain a database containing information from item 1. Assess sportfish populations in seven southwestern Wisconsin streams: As scheduled, sportfish populations were monitored in late August-early September 2002 following standardized wading electrofishing procedures from single 950 to 1900-m-long stations on seven warmwater streams in southwestern Wisconsin. Although this study began in 2000, these seven stations have been sampled in the same manner as part of other studies since 1989-1991, depending on the station. The primary gamefish at each station is smallmouth bass; northern pike, channel catfish, bluegill, rock bass, and walleye are encountered at a few of the stations in generally low numbers. Smallmouth bass catch-per- 100-m was relatively low in 2002 at all stations except the Sinsinawa River (where it was above average) for all size- and age-classes, reflecting a regional pattern of low recruitment over the last 6 years. Low recruitment has probably been caused by several years of flooding during late May and early June that has disrupted smallmouth bass spawning.

Title: Status and trends in the fish community of the Lower Wisconsin River. Contact person: John Lyons, John.Lyons@dnr.state.wi.us

Study objective: 1. Monitor long-term fish community dynamics each year over the entire Lower Wisconsin River. 2. Evaluate sportfish abundance, reproductive success, size structure, and growth rate each year for the Prairie du Sac Dam tailwater, continuing annual surveys begun in 1987. 3. Maintain a database containing information from item 1 and 2. Assess fish communities over the entire Lower Wisconsin River: In September 2002, the fish assemblage of the main-channel-border habitat was monitored by standardized daytime boat electrofishing at 10 one-mile-long stations along the 92.3-mile length of the Lower Wisconsin River. These 10 stations had also been sampled in the same manner each year in August/September since 1999. An attempt was made to capture all fish observed. Captured fish were identified, counted, weighed, and checked for disease and the resulting data were used to calculate an index of biotic integrity (IBI) as a measure of river health. In 2002, a total of 44 species (plus 2 hybrids) and 1519 fish were collected from all 10 stations combined. Included were 13 gamefish species (plus 1 gamefish hybrid, saugeye), two state special-concern species (2 silver chub, 4 western sand darter), two state-threatened species (53 blue suckers, 4 black buffalo), and one state-endangered species (2 crystal darters). Eight species (common carp, spotfin shiner, river shiner, quillback, smallmouth buffalo, shorthead redhorse, smallmouth bass, and sauger) occurred at all 10 stations. The most numerous species were emerald shiner (348), shorthead redhorse (207), and spotfin shiner (108); the greatest biomass was collected for common carp (181 kg), shorthead redhorse (138 kg), and blue sucker (125 kg). Among the gamefish, the most numerous species with the most biomass were smallmouth bass (69 individuals; 26.2 kg), sauger (37; 11.0 kg), walleye (22; 10.4 kg), channel catfish (20; 4.9 kg), white bass (15; 3.2 kg), and bluegill (15; 1.2 kg). Index of biotic integrity scores and ratings ranged from 75 (good) to 100 (excellent), and 9 of 10 stations had excellent ratings. Scores and ratings in 2002 were

similar to those in previous years. Estimate sportfish population parameters for the Prairie du Sac Dam tailwater: On October 23 and again on October 24, 2002, standardized nighttime boat electrofishing was used to monitor populations of sauger, walleye, largemouth bass, smallmouth bass, muskellunge, and northern pike over a 1.8-mile length of shoreline in the Prairie du Sac Dam tailwater. Although this study began in 2000, this monitoring has been conducted since 1987 as part of other studies. The emphasis of the monitoring is to determine the relative abundance and growth of young-of-the-year (YOY) sauger and walleye in order to assess yearly fluctuations in recruitment. In 2002, a total of 202 sauger (6.8-18.7"), 552 walleye (6.8-29.4"), 5 saugeye (sauger X walleye hybrids)(8.1-17.3"), 18 largemouth bass (5.4-16.6"), 8 smallmouth bass (8.0-12.7"), 20 muskellunge (19.7-39.3"), and 1 northern pike (25.3") were collected. The catch rate of 0.3 YOY sauger per mile was the lowest recorded since 1987 and well below the long-term mean (7.2), whereas the catch rate of 44.5 walleye per mile was similar to the long-term mean (42.5). Mean size of YOY sauger (6.8") was below the long-term average (7.1") whereas mean size of YOY walleye (8.5") was above the long-term average (8.2").

Title: Impacts of dams and dam removal on fish community structure and migrations in the Baraboo River. Contact person: Matt Catalano, Matthew.Catalano@dnr.state.wi.us.

Study objectives: A. The evaluation of fish community structure in the Baraboo River will test the hypothesis that: 1. The assemblage of lotic fish species at randomly selected sites upstream of the Linen Mill Dam differ significantly, in terms of species composition and species abundance, from the assemblage of lotic fish species at similar sites downstream of the dam. 2. Dams disrupt longitudinal patterns in fish assemblage structure, fish-habitat relations, and biotic integrity along the Baraboo River. 3. There is an observable pattern of recolonization and stability in the Baraboo River fish community during the time period from pre-dam removal to 8 years post-removal. B. The evaluation of fish movements and migrations will test the hypothesis that: 1. Selected lotic fish species seasonally migrate within and/or between the Baraboo River and the Wisconsin River. 2. Low head dams, such as the Linen Mill, Oak Street and LaValle dams on the Baraboo River, are a deterrent to the seasonal migration of selected lotic fish species within and between rivers and their tributaries. 3. Removing the Linen Mill, Oak Street and LaValle dams will allow selected lotic fish species to migrate freely between the Baraboo and Wisconsin rivers, and within the Baraboo River. 4. Removing the Linen Mill, Oak Street and LaValle dams will result in a reduction in the relative abundance, and in the redistribution, of common carp (Cyprinus carpio) within the Baraboo River.

A) Evaluate fish community structure in the Baraboo River: Fish were collected from July 1, 2002 to October 31, 2002 and from June 15, 2003 to June 30, 2003 by electrofishing at four impoundment and three tailwater sites using standard methods for sampling fish communities in Wisconsin's rivers and streams. Reach-scale fish community recovery patterns following dam removal were evaluated by comparing pre- and post-dam removal fish community data from sites adjacent to, and hydrologically affected by dams (i.e., impoundments and tailwater areas). Fish assemblage structure was quantified using community indices such as the index of biotic integrity, species richness and diversity, guild composition (e.g., percent top carnivores, percent riverine species, percent tolerant species), and individual species abundances (e.g., smallmouth bass, carp). Fish community health and quality improved substantially within one year of dam removal as biotic integrity, species richness, and sensitive species such as smallmouth bass increased, while tolerant species such as carp decreased. Recolonization dynamics were evaluated by assessing the rate and degree to which species with truncated pre-removal distributions extended their upstream ranges following dam removal. Fish were collected at 35 study sites along the Baraboo River and tributaries from July 1, 2002 to October 31, 2002 and from March 20, 2003 to June 30, 2003 using standardized methods. Using presence/absence data, the range and upstream distribution of each fish species was established for pre- and post-dam removal time periods. Pre-dam removal data were used to identify species with truncated upstream distributions at dam sites (i.e., found downstream but not upstream of dams). Eight of 20 species with truncated pre-removal distributions recolonized upstream habitats within one year following dam removal.

B) Evaluate fish movements and migrations in the Baraboo River and between the Baraboo and Wisconsin rivers: The effects of dam removal on fish migration patterns were evaluated using target species known to undergo seasonal migrations and relevant to sport fish recovery. Twelve native, lotic species including lake sturgeon Acipenser fulvescens, northern pike Esox lucius, quillback Carpiodes cyprinus, channel catfish Ictalurus punctatus, smallmouth bass Micropterus dolomieui, and walleye Stizostedion vitreum, among others, were selected for study. Electrofishing gear and hoopnets were used to collect fish weekly from July 1, 2002 to October 31, 2002 and from March 20, 2003 to June 30, 2003 at six study reaches along the mainstem Baraboo River. Target species were

tagged with individually numbered anchor tags and the date and location of release and recapture were recorded. Initial analyses used recapture data to test for differences in migration distance and direction between pre- and post-dam removal periods, among study reaches, and among seasons. In addition, the timing, species sequence, and environmental influences of fish migration were evaluated by monitoring sexual maturity of selected species through time and relative to environmental variables such as photoperiod, water temperature, and discharge.

Study Publication: Catalano, M. J., M. A. Bozek, and T. D. Pellett. December 2002. Evaluating fish-habitat relations, fish distribution, and the effects of dam removal in the Baraboo River, Wisconsin. Master's Thesis. University of Wisconsin-Stevens Point.

Title: Spawning and early life history of flathead catfish in the Upper Fox and Wolf Rivers, Wisconsin. Contact person: Ed Emmons, Edward.Emmons@dnr.state.wi.us.

Study objective: Identify critical spawning and nursery habitat by following movements of flathead catfish *Pylodictis olivaris* in the Wolf and Upper Fox Rivers in east-central Wisconsin. Radio-tag and track mature male flathead catfish: Twenty male flathead catfish were radio-tagged in the Fox River in spring 2002, and an additional four were tagged in spring 2003. Of these 24 fish, anglers have returned 3 tags and 2 tags have not been located since 2002. The remaining 19 fish will continue to be tracked weekly by air and/or boat for another year. Locate spawning locations and describe the biotic and abiotic characteristics of these sites: Specific spawning sites were located by boat in early summer. Water depths, general structural components and attributes of nest sites were recorded at specific GPS coordinates. Water temperatures from continuous recorders will be compared to peak movements during open water periods.

Title: Evaluation of the Wisconsin Priority Watershed Program for Improving Stream Habitat and Fish Communities. Contact person: Brian Weigel, Brian.Weigel@dnr.state.wi.us.

This project was designed to determine the extent to which installation of best management practices (BMPs) improves the quality of aquatic resources. The study design is to sample habitat and fish communities using standardized procedures with known accuracy and precision at treatment and reference streams several years before and several years after BMP installation. Practical, standardized procedures have been developed for determining the characteristics and quality of wadeable stream physical habitat and fish communities. Two physical habitat (one for low and one for medium-high gradient) and two fish biological indices (one for coldwater and one for warmwater) have also been developed and tested. Fish and habitat data from 81 sites on 33 streams for five priority watersheds and their reference watersheds during the past 11 years have been stored in a centralized database. The evaluation of the Spring Creek Watershed, which demonstrated significant habitat and fish community improvements after BMP implementation, is complete. WDNR is in the process of evaluating Otter Creek watershed, which will continue through 2002. Due to the lack of BMP implementation, sampling three of the five priority watersheds has been discontinued until sufficient BMPs have been installed. The results from Spring Creek provide novel information regarding the sufficiency of riparian and watershed BMPs in improving stream habitat and biological communities.

Title: Development and Evaluation of Watershed Models for Predicting Potential Stream Condition and Making Land Use Decisions. Contact person: Matt Mitro, Matthew.Mitro@dnr.state.wi.us.

The goal of this study is to develop and test models that quantify stream biological expectation and to predict how watershed land uses will influence the realization of this expectation. The approach used was to develop models that predict stream segment temperature, flow, and biological conditions based on climate, surficial geology, topography, soil, vegetation, and land uses for various regions of Wisconsin. These models are then linked to classify and map Wisconsin stream segments to explore how projected land-use changes may affect stream conditions for selected watersheds. At the time of report publication, collection of field physical and biological data and developing GIS layers for watershed characteristics was being conducted. The developed models can be used to classify stream reaches that lack adequate fish data and to estimate how watershed land-use has influenced thermal regimes, flow

patterns, and fish communities across broad regions. Fisheries managers will be able to compare the expectations for a specific watershed with its current condition to determine its potential for improvement and to establish more realistic fishery goals. Planners can use these models to predict biological conditions under different landuse scenarios. Based on the stream classification, sampling and inventory efforts can be better allocated among watersheds and streams to maximize efficiency and statistical reliability for bioassessment.

Title: Status Assessment and Development of a Fish IBI for Small Warmwater Streams. Contact person: John Lyons, John.Lyons@dnr.state.wi.us.

The objectives of this study are to evaluate fish and habitat status and to develop a fish IBI for small warmwater Wisconsin streams. Ninety-eight (98) small warmwater streams throughout the state with different levels of impairment (from lest to highly impacted) have been sampled for fish and habitat twice a year for two years. Watershed boundaries have been delineated and land use information for these stream catchments has been gathered. The results from this study will provide information on fish and habitat conditions for these small warmwater streams, which is currently unknown. The IBI developed here will provide a tool for setting regulatory criteria and bioassessment for these types of streams.

Title: Monitoring & Assessment Development of a Probability-Based Stream Monitoring and Assessment Strategy. Contact person: Mike Miller, Michael.A.Miller@dnr.state.wi.us

Millions of dollars have been spent in the state of Wisconsin on monitoring and watershed and stream management activities, yet aside from limited site-specific examples, there is little evidence of the effectiveness of these efforts in broadly protecting or restoring stream resources. Certain land use practices continue to significantly impact many of the state's waters and in some areas continued severe degradation of stream resources are apparent. In the absence of comprehensive data on the status of Wisconsin's stream resources and lack of understanding of how land use factors impact streams, politics continue to drive land and water resource management activities. To reverse stream resource losses, improvements in stream monitoring, assessment, and greater understanding of factors impacting water resources are needed. The resulting data and information will be used to guide and evaluate stream resource assessment and management activities, and educate the public and political policy makers. This collaborative project is designed to: 1) determine whether three different methods used to select stream assessment sites significantly influence field data gathered to evaluate the condition of individual and populations of streams; 2) investigate how large-scale catchment attributes affect riparian and in-stream habitat and water chemistry, which in turn influence the biological integrity of streams; and 3) pilot the development of a multi-metric macroinvertebrate index for wadeable streams in the Driftless Region ecoregion in western Wisconsin, and subsequently apply this process to develop a macroinvertebrate index for the entire state. The results of this study will be used to improve the Wisconsin Department of Natural Resource's (WDNR) wadeable stream monitoring and assessment program, and advance and institutionalize the use of probability based monitoring in Wisconsin.

Title: Asian Carp Monitoring Plan. Contact person: John Lyons**,** John.Lyons@dnr.state.wi.us

Introduction: Asian carp (bighead carp *Hypophthalmichthys nobilis* and silver carp *H. molitrix*) are exotic fishes from eastern Asia that have become established in the middle and lower Mississippi River basin. They appear to be expanding their range upstream and may invade Wisconsin waters within the next few years. Already there are anecdotal reports of single Asian carp from the Wisconsin portion of the Mississippi River and lower St. Croix Rivers in the commercial fishing catch, although as yet there is no evidence that self-sustaining populations are present. Asian carp represent a grave potential threat to Wisconsin's native fish populations and fisheries. They are highly efficient filter feeders on plankton and could compete with numerous native species for food, including the larvae of many warmwater gamefishes.

During 2003, the WDNR Fish and Habitat Research Section will implement a plan to monitor the possible spread of Asian carp into the Wisconsin portion of the Mississippi River. The goal of this monitoring will be to document the arrival of the two species carp and to determine the biological characteristics (i.e., relative abundance, size and age

structure) of any populations that may become established. The data collected will be an important baseline upon which to develop additional projects to determine the effects of Asian carp on the native fish fauna.

Monitoring Plan:
Location: The monitoring will take place in Navigation Pool 11 of the Mississippi River, Grant County, Wisconsin. This is the downstream most pool completely within Wisconsin, and it has large amounts of habitat that appear to be suitable for Asian carp. A small portion of Pool 12, the next pool downstream, occurs in Wisconsin opposite DuBuque, Iowa, but this portion has limited suitable habitat and its proximity to a DuBuque greatly increases the chances that the sampling gear will be disturbed by anglers or boaters. Sampling will take place in those habitat types most likely to be frequented by Asian carp – backwaters, sloughs, and side channels. Two areas of Pool 11 that encompass all of these habitat types will be sampled, Cassville Slough and Jack Oak Island Slough.

Gear: Based on recommendations from biologists in Illinois and Missouri familiar with techniques for capturing Asian carp, the primary sampling gear will be large-mesh trammel nets. During each sampling period we will set eight 300-ft X 6-ft bottom trammel nets each having a 4-inch (bar) mesh inner panel and 14-inch (bar) mesh outer panels. Four nets will have monofilament nylon netting and the other four will have multifilament nylon netting. Nets will be set on the bottom in at least nine feet of water in areas of limited or no current, held in place by anchor weights at each end, and marked by at least two buoys.

Frequency: Sampling will occur for two days per month from May through September. Four nets (two mono, two multi) will be set in each area on day 1, left overnight, and pulled on day 2 after approximately 20 hours in the water. This yields 40 net-nights per year. Nets will be set in the same general locations every month, but will likely not always be set at the same exact spot because of variations in water level and flow conditions. Locations of each net set will be marked with a GPS unit. Sampling is scheduled to take place for at least six years, with a re-evaluation of sampling procedures, gear, and locations after each year.

Data: All fish captured during sampling will be identified and counted. All Asian carp will be measured for total length, weighed, and have scales removed for aging. The first specimens of bighead and silver carp will be photographed and then preserved at the University of Wisconsin Zoological Museum as vouchers. All data collected will be summarized in an annual report that will be distributed to all interested parties within and outside the WDNR, including the U.S. Fish and Wildlife Service, U.S. Geological Survey – Biological Resources Division, Iowa Department of Natural Resources, and Minnesota Department of Natural Resources.

Inter-Fluve 2003-2004 Wisconsin Projects.
Contact person: Marty Melchior, mmelchior@interfluve.com

Milwaukee County Stream Assessment. Inter-Fluve geomorphologists studied 120 miles of channel and completed a comprehensive evaluation of riparian condition and geomorphic stability in all of the streams of Milwaukee Co.

Trout Creek Watershed Restoration. Inter-Fluve designed and supervised construction of 2000 feet of natural channel restoration in the headwaters of Trout Creek on the Oneida Reservation. Other similar projects are planned for 2004.

Bayfield Streams Fluvial Geomorphic Assessment, Bayfield, WI. Inter-Fluve completed a fluvial geomorphic assessment of 60 miles of streams in the Bayfield Peninsula. The final report was submitted to Trout Unlimited, the WDNR, the USFWS and the Red Cliff Tribe.

Little Menomonee River – Reach 2/3, Milwaukee, WI. Inter-Fluve is currently providing final design assistance, WDNR review and construction oversight for natural channel restoration of 3 miles of the Little Menomonee River.

Engineered Debris Jams, Bayfield, WI. Inter-Fluve is working on a series of projects reintroducing large woody debris into Bayfield peninsula streams.

Deer Creek Streambank Restoration, Ashland, WI. Inter-Fluve will be providing design and construction for a large slope failure on Deer Creek near Ashland. Construction will be 2005-06.

U.S. GEOLOGICAL SURVEY - WATER RESOURCES DIVISION, WI

The Western Lake Michigan Drainages study unit of the USGS National Water Quality Assessment (NAWQA) program has begun its third year of intensive sampling in 2004. Sampling for water quality, habitat, and stream biology will be done at 4 trend sites sampled during the last cycle of intensive sampling in 1993-95. Additional national NAWQA studies in progress include (1) a study of the ecological effects of urbanization on streams, and (2) a study of bioaccumulation of mercury in stream ecosystems. The urbanization effects study will include 30 streams in the Milwaukee and Green Bay areas and include assessment of changes in water flow and chemistry, habitat, and communities of algae, benthic invertebrates, and fish. The mercury study focuses on better understanding the effects of source strength, mercury cycling, and food-web interactions on bioaccumulation of mercury in riverine fish; three Wisconsin streams are included. For more information, contact Barb Scudder (em: bscudder@usgs.gov, ph: 608-821-3832) or visit http://wi.water.usgs.gov/nawqa/index.html

An Aquatic Gap Analysis project for the Great Lakes States began in 2001 as part of the USGS National Gap Analysis Program. Gap analysis is a program for identifying the degree to which native species and natural communities are represented in current conservation lands. Those areas where unique biological communities and conservation lands do not overlap constitute gaps in conservation efforts. A gap analysis is an approach for biodiversity planning using computer-based geographic information systems to map land cover, conservation areas, aquatic habitat, and species distributions. To accomplish this, the GAP program builds institutional cooperation at the state and regional level with projects conducted at the state level. Information from gap analysis may be used to identify and prioritize opportunities to conserve riverine biodiversity; identify information or data gaps; help design and plan sampling strategies for research and monitoring; assist in county, state, and regional planning; and assist with education and outreach. Great Lakes Aquatic Gap projects are currently underway in MI, OH, NY, and WI with plans to begin aquatic gap projects in the other GL States in the future. Electronic fish databases were compiled from stakeholders and a GIS-based habitat classification for streams is nearing completion. A centralized Great Lakes GAP database was developed, and information will be linked to allow predictive modeling and identification of conservation gaps. The Great Lakes project is being coordinated by the USGS Water Resources Division in Middleton, WI. For more information contact Jana Stewart (em: jsstewar@usgs.gov, ph: 608-821-3855) or visit the web site at http://www.glsc.usgs.gov/research/aquaticGAP.asp

In 2004, the USGS WRD office continues a cooperative study with the Milwaukee Metropolitan Sewerage District (MMSD), the Wisconsin DNR, SE WI Regional Planning Commission, and local universities. This year, 15 sites on 9 Milwaukee area streams are being sampled for water chemistry to provide a baseline to facilitate future impact evaluations. In addition, stream habitat and community composition of algae, benthic invertebrates, and fish will be assessed in late summer/early fall 2004. A USGS report was just published that describes water-resources related information for the MMSD area from 1970-2002, and a database of historical water and biological data was developed. For more information contact Dave Graczyk (em: dgraczyk@usgs.gov, ph: 608-821-3840 or Barb Scudder (em: bscudder@usgs.gov, ph: 608-821-3832).

USGS-Upper Midwest Environmental Sciences Center

Individual study titles, PI's, and objectives can be found on our website http://www.umesc.usgs.gov/ under research spotlights and science programs.

Managing pathways of biological production in large rivers. Steven Gutreuter, sgutreuter@usgs.gov

Nutrient loading and effects in large rivers. William Richardson, wrichardson@usgs.gov

Freshwater mussels in the Upper Mississippi River. Teresa Newton, tnewton@usgs.gov

Invasive aquatic species. Cindy Kolar, ckolar@usgs.gov.

Analysis of the Long Term Resource Monitoring Program data from the Upper Mississippi River to identify trends and understand the structure and function of large rivers to inform management. Fish Component - Brian Ickes,

bickes@usgs.gov; Vegetation Component - Yao Yin, yyin@usgs.gov; Macroinvertebrate Component - Jennifer Sauer, jssauer@usgs.gov; Water Quality Component - Jeff Houser, jhouser@usgs.gov

US Army (Fort McCoy and Joliet Training Area)
Contact: John Noble, john.noble@emh2.mccoy.army.mil

Coldwater IBI monitoring (55 sites): on-going habitat and fish community monitoring of Fort McCoy coldwater streams.

Surface water quality monitoring (rain event and quarterly monitoring). Thermographs.

Continue on with evaluating trout redds in relation to groundwater up/down welling. Identifying critical habitat.

Monitoring for round goby Jackson Creek (Joliet Training Area, Illinois). Presence/absence.

Surface water quality monitoring (quarterly nutrient monitoring, Joliet Training Area)

Stream habitat enhancement including trout stream habitat work with woody debris, sediment trap maintenance, and potentially lunker work.

Major focus on stormwater detention basins, cantonment are stormwater management (building/parking lot "urban runoff"), and sediment management. Also, will be dredging (hydraulic) two ponds on two different coldwater streams.

Upgrading two dams (Hazel Dell and Sparta Pond).

Recent drought effects on trout production – evaluation of vegetation importance in streams dominated by sandy substrate.

A joint - partnership project to mitigate surface water discharges from a cranberry operation on Clear Creek. Extensive review of the operation with preliminary goals to improve downstream flow regimes - more stable, obtaining cooler temperatures, and reducing sediment delivery. Working with Dan Helsel (DNR), LCD, NRCS, FWS, and McCoy. Early stages yet, trying to get research hooked up for monitoring - measuring project success.