

**ILLINOIS CHAPTER AMERICAN FISHERIES SOCIETY**

**2013 ILLINOIS REPORT**

**TO THE**

**NORTH CENTRAL DIVISION AFS**

**RIVERS AND STREAMS TECHNICAL COMMITTEE**



Respectfully submitted

March 26, 2013

## **2012 Drought and Heat Affect Fisheries Resources Statewide**

The nearly nationwide drought of 2012, combined with record heat, likely exerted a heavy toll on Illinois' aquatic life. According to the Illinois State Water Survey (ISWS), statewide average precipitation in 2012 was 30.4 inches or about 75% of the 1981-2010 mean. Deficits were most pronounced in late summer, however, after many months of dry weather (rainfall was 2-3" below monthly means May through July). By the first week of August, 16 USGS streamflow gauges, mostly across central Illinois, showed flows below  $Q_{7,10}$  (the minimal flow deemed adequate to maintain water quality) and dozens more stations across the state showed streams and rivers near or below record low levels.

As air temperatures soared above 100 degrees (F) in June and July, reports of fish kills mounted. By mid-July, kills of various sizes were reported on the Mississippi, Fox, Kankakee, DesPlaines, Embarras, Little Wabash, Vermilion and Kaskaskia Rivers. Backwaters along the Illinois River were hit particularly hard. One "silver" lining among the riverine fish kills was the prevalence of Asian carp (very vulnerable to low dissolved oxygen) but many thousands of sport fish, and likely millions of other native fishes, perished as well. Mussel die offs were difficult to quantify but likely significant as miles of streambeds became desiccated in tributaries and even shallower sections of rivers such as the Embarras, Fox, Kankakee, Little Wabash and Kaskaskia.

*Sources: various IDNR correspondences and IL State Water Survey publications*

## **Illinois State House a Safe Haven for Fishes in 2012**

Several pieces of legislation with implications for Illinois' aquatic resources were proposed in the past year. The first (SB 3414) would have weakened the Illinois Environmental Protection Act with a change in rulemaking language. Specifically, the change would allow "significant economic harm or hardship" as a basis for the Illinois Pollution Control Board to adopt emergency rulemaking. Since the existing rules already allow consideration of economic factors, this revision would give potential polluters even greater leeway in citing financial "hardship" as a legitimate reason to relax effluent (and other environmental) standards. The bill passed the Illinois Senate in March 2012 but died in the House Rules Committee shortly thereafter. ILAFS had joined Illinois Environmental Council (IEC) and a host of other organizations in their opposition to this potentially disastrous piece of legislation.

The Chapter drafted a letter of support for HB 5642 which would grant IEPA regulatory oversight over Confined Animal Feeding Operations (CAFOs) under the National Pollutant Discharge Elimination System (NPDES). CAFO's or "factory farms" often house thousands of swine, cattle or poultry, generating animal waste equivalent to a small city. Yet they have been exempt from water quality standards to date, only facing "after the fact" enforcement in the event of catastrophic spills. The bill proposed a nominal registration fee, based on size of the facility, sufficient to fund appropriate staff and other resources to regulate their discharges. This legislation was passed into law (PL 97-0962) on August 15, 2012.

House Bill 3888 amends the Boat registration and Safety Act, making it illegal to transport aquatic plants and animals attached to a seaplane, vehicle, or watercraft. This bill was crafted to help curb the spread of Aquatic Nuisance Species (ANS) in Illinois. Practical exemptions are made for transport of duckweed and for commercial aquatic plant harvesting equipment owned

by a local unit of government. It was passed into law (PL 97-0850) on July 26, 2012. On last piece of legislation with implications for aquatic life (although not in Illinois) was PL97-0733, which amends our Fish and Aquatic Life Code by banning the sale or distributions of shark fins (a delicacy whose harvest has helped decimate shark populations) in Illinois.

### **Bill Introduced in Illinois House Would Tightly Regulate Fracking**

Recently (2/21/2013), a bill was introduced in the Illinois House which would regulate the practice of horizontal hydraulic fracturing, or “fracking”, in Illinois. Fracking is a modern refinement of an old technology used to extract oil and natural gas from within shale deposits. It involves the high pressure injection of large volumes of water, sand and various chemicals to free up fossil fuels which would otherwise not be economically recoverable. Since some of the chemical constituents are potentially toxic and large amounts of water are utilized, this practice has significant implications to Illinois’ aquatic life.

In other states experiencing a boom in fracking (Pennsylvania, Ohio, Colorado and North Dakota), lax or poorly enforced environmental regulation has allowed pollution of air, groundwater and surface water resources. Even earthquakes have been reported following the infusion of huge volumes of water into geologically volatile strata. For the past few years, speculators have been buying up land and mineral rights in our state, particularly atop the oil and gas rich New Albany Shale in southeastern Illinois. To date, no special regulations exist that would regulate this practice here, and various environmental groups have teamed with legislators to recommend a two year moratorium to examine the environmental impacts of fracking before allowing it in Illinois.

Given the political realities of today, particularly those favoring job creation and energy independence, the moratorium does not appear to generate wide enough support for passage. Recognizing this, a coalition of environmental groups, industry representatives and governmental officials (state representatives, agency staff and Attorney General’s office) have been involved since last October in crafting legislation that would allow fracking to occur in an environmentally responsible, tightly regulated manner. The result, HB 2615, has been deemed by all involved as the most comprehensive and stringent set of regulations governing hydraulic fracturing yet.

Among the provisions of this legislation are:

- Strong well construction standards to prevent leakage found in other states
- Storage of waste water in closed-loop tanks rather than open pits
- Pre-fracking testing of ground and surface water and subsequent water monitoring
- Provisions to protect water supplies including authority to deny permits as necessary during drought conditions
- Presumption of liability for contamination that appears post-fracking in proximity to operations
- Setbacks from water bodies and nature preserves
- Ban on injecting diesel compounds
- Mandatory water management plans describing methods used to minimize water withdrawals along with total accounting of water sources (and amounts) used

In addition to the above measures which directly affect aquatic resources, the proposed law contains extensive opportunities for public review (including permit hearings and appeals), citizen enforcement, and required bonding and insurance requirements. These measures are a culmination of extensive review of fracking practices elsewhere in the nation and a concerted attempt to avoid and minimize problems seen elsewhere.

House Bill 2615 passed its first reading and has been referred to the House Rules Committee. Passage in the House would appear likely as 26 members, nearly a quarter of the entire body, have signed on as co-sponsors. A similar bill must be introduced in the State Senate before the legislation can pass through the General Assembly and be brought to Governor Quinn. While this legislation may not be everything the environmental community wanted, it represents a landmark piece of Illinois lawmaking. This degree of transparency and balanced stakeholder involvement are rarely seen in such controversial legislation. *Sources: Illinois Environmental Council and Natural Resources Defense Council*

### **Embattled Developer Halts Megadairy Construction in Apple River Watershed**

On November 15, 2012 the Illinois Pollution Control Board (IPCB) announced a settlement agreement between the Illinois Attorney General's Office and Traditions megadairy owner and investor A.J. Bos of Bakersfield, California. According to the terms of the settlement, Bos will abandon the construction site, near Nora in Jo Daviess County, where two industrial sized dairy facilities were planned atop fragile karst topography in the Apple River watershed. This culminates a nearly five year, multi-million dollar battle between Traditions and its opposition, spearheaded by a dedicated cadre of local family farmers and other nearby residents.

Carrying a litany of environmental and labor violations from other such facilities in the Pacific Northwest, Bos apparently viewed Illinois as a friendly atmosphere for his industrial dairy operations when applying for a siting permit to Illinois Dept. of Agriculture (IDOA) in 2008. Despite objections from the local County Board and others (including ILAFS), IDOA issued their permit for one of the 5500 head units shortly thereafter. This was followed almost immediately by legal action from the local grassroots group, HOMES, which sought an injunction against construction based on environmental concerns.

Not only would the proposed facility sit atop a sinkhole ridden limestone karst topography (verified by testimony from IL State Geological Survey expert but denied by IDOA officials), one of the units would have been built over a tributary to South Fork Apple River. The 200 million gallons of annual manure output were to be "handled" by earthen lagoons and subsequent land application. Our Chapter's letter of opposition was predicated on the potentially disastrous implications of such a poorly designed facility on the aquatic life of the Apple River, a Biologically Significant Stream known to harbor state listed mussel species and a unique, coolwater fish community.

Traditions accrued environmental violations shortly after its groundbreaking. In September 2008, Bos piled 26,000 tons of corn silage on a concrete slab at the nascent megadairy. A short time later this material started leaching an acidic discharge. In the meantime, IEPA and USEPA had initiated investigations following complaints by locals and the latter agency demanded

detailed site and waste management information. By 2010, USEPA backed by the Justice Dept, demanded Bos to undertake a hydrogeologic study to determine groundwater impacts.

A turning point occurred in October 2010 when a tributary to South Fork Apple River turned bright purple following a large discharge of silicate leachage. At that point, IEPA prompted the IL Attorney General's office to take legal action which eventually culminated in last month's settlement. The Traditions megadairy generated four illegal discharges, never received an IEPA permit for constructing one of its lagoons over a stream, and failed to initiate the federally demanded groundwater study. All this occurred without housing a single cow in a facility that was slated for over 10,000 head.

The history of Confined Animal Feeding Operations (CAFOs) in Illinois and elsewhere is replete with environmental impacts including objectionable odors, groundwater contamination and massive fish kills. In the interest of Illinois' aquatic life, it is hoped that oversized, poorly planned facilities such as Traditions will not find favor with their prospective neighbors. *Excerpted from website "StopTheMegaDairy.org"*

### **Study Shows Asian Carp eDNA Can Disperse Independently of Live Fish**

On February 20, the Asian Carp Regional Coordinating Committee (ACRCC) released an interim report from the Asian Carp Environmental DNA Calibration Study (ECALS). The project is being conducted jointly by the US Army Corps of Engineers, US Fish and Wildlife Service, and US Geological Survey to assess mechanisms and pathways whereby Asian carp eDNA can remain viable apart from a living fish. Environmental DNA is genetic material which originally emanates from slime, scales and excrement of live fish and can show up in water samples. Over the last three years, eDNA testing has been used as a tool to help direct more intensive surveillance and control methods, including netting, electrofishing and fish toxicants.

Preliminary findings of this study indicate six potential pathways whereby eDNA can be transported to a receiving waterbody and remain detectable for several days. These include storm sewers, fish sampling gear, fish-eating birds, dead fish carcasses, barges and sediments. Tagged birds fed Asian carp pass the material in their feces, leaping silver carp can leave slime on barge decks and hulls, and waste materials from fish markets and residences can make their way into municipal effluents. Such findings may help explain why eDNA "hits" persist in areas below the Chicago Area Waterway System's (CAWS) electric barriers despite the collection of only one live carp in this area (Lake Calumet in 2010) .

Researchers at the University of Notre Dame, where eDNA technology was developed, say they never claimed that all the positive tests indicated live fish. Dr. Chris Jerde points out, however, that the great majority of such tests are clustered near collection sites of live carp (both in the CAWS and Lake Erie). Jerde said "These patterns...would seem to indicate that there's at least some live carp present in the system, although we don't know how many". The ECALS study will continue to examine how environmental variables such as light, temperature, and water velocity impact eDNA detection, explore correlation between the number of positive samples and strength of the eDNA source, and refine this tool's efficiency and specificity to the CAWS. *Sources: Associated Press 2/21/2013 and ACRCC website.*

### **Federal Judge Dismisses Multi-state Asian Carp Lawsuit**

On December 3, 2012, US District Judge John Tharp dismissed a lawsuit filed jointly by five states (Michigan, Wisconsin, Minnesota, Ohio and Pennsylvania) which sought to curb the spread of Asian carp into the Great Lakes through lock closure (Chicago Sanitary and Ship Canal and Calumet River) and other physical measures. The two year old lawsuit accused the US Army Corps of Engineers and Chicago's Metropolitan Water Reclamation District of creating a "public nuisance" by failing to physically separate Lake Michigan from a network of streams and canals potentially capable of conveying the invasive species from known populations in the Upper Illinois Waterway into the lake.

In his ruling, Judge Tharp maintained that existing Federal law requires the Corps to maintain an open shipping channel between Lake Michigan and the Des Plaines River. The judge added he was "mindful of, and alarmed by, the potentially devastating ecological, environmental, and economic consequences that may result from the establishment of an Asian carp population in the Great Lakes" but that only Congress, and not the courts, could authorize the physical separation of the two systems. He gave the states until January 11, 2013 to replead their case in a way that doesn't request violating the law. To date, no further action has been taken.

A spokesman for Michigan Attorney General Bill Schuette said "we are reviewing this decision and considering our options". This is the latest in a series of legal setbacks for the plaintiffs; four times previously the U.S. Supreme Court refused to order temporary measures such as closing the locks. The controversy has been brewing for over a decade; the first electric barriers were installed in the Chicago Waterway in 2003 and since then millions have been spent in monitoring and control efforts. Despite eDNA evidence to the contrary, not a single live Asian carp has been collected in Lake Michigan and only one (Lake Calumet in 2010) has been taken anywhere below the barriers. *Excerpted from Associated Press release, 11/4/2012.*

### **Governor Announces Ambitious Dam Removal Initiative**

On October 26, 2012, Governor Pat Quinn announced completion of the Hoffman Dam removal on the Des Plaines River as part of a nearly \$10 million Illinois Dam Removal Initiative. The program will significantly improve the health of Illinois waterways by removing or modifying 16 low head dams throughout the state over the next several years. Three of the Des Plaines River structures have already been removed, with the most recent project opening up more than 15 miles of stream habitat formerly inaccessible to downstream fish and mussel species. Stagnant, silted waters have been replaced by a diverse pool, riffle and run sequence of greater value to a wide variety of aquatic species.

According to the Governor, "Free-flowing rivers benefit all of Illinois. Removing these dams will improve waterways across our state making them safer for kayakers and paddlers who use them for exercise and recreation, and for anglers who enjoy fishing in these rivers. This dam removal initiative will improve conservation, water quality and outdoor recreation in Illinois." IDNR Director Marc Miller added "Removing dams improves water quality, aquatic habitat, and recreational safety". The latter concern has been highlighted by recent drownings involving boaters in the deep, turbulent waters directly below these antiquated dams.

IDNR Fisheries staff have documented marked improvements in stream fisheries almost immediately following dam removal, most notably in species diversity owing to the connectivity

of upper stream reaches to formerly inaccessible colonization sources. Not only have sport species such as smallmouth bass and channel catfish shown positive responses, but so too have native suckers, minnows and darters. Following one such project on the Fox River, the State Endangered greater redhorse was found in an upstream reach with no previous collection records.

Future projects under this initiative will involve the Des Plaines River (\$6 million to remove or modify eight low head dams and free up 32 miles of river) and North Branch of the Chicago River (\$3.5 million for projects involving four dams and 55 miles of restored stream). These two rivers involve multiple local partners such as Forest Preserve District of Cook County, Chicago Park District, and Metropolitan Water Reclamation District of Greater Chicago as well as the U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service. In addition, the Fox River and both Vermilion Rivers (Illinois River and Wabash River tributaries) are being considered for future removal or modification projects. *Excerpted from State of Illinois press release 10/26/2012*

While the majority of local residents applaud such projects for their public safety, recreational and ecological benefits, there remain pockets of opposition. For instance, a small cadre of bass anglers in the Danville area oppose the removal of dams on the Vermilion and North Fork Vermilion River over concerns that it would harm fishing opportunities due to decreased pool depths and boat access. Three drownings have occurred there since 1995, and removal would open up about 175 miles of stream habitat including the Salt Fork and Middle Fork Vermilion Rivers. Multiple public hearings on these projects should provide opportunities for outreach and education regarding the myriad benefits of dam removal to Illinois citizens.

### **Alligator Gar Reintroduction Continues**

Illinois continues to make progress on their reintroduction of Alligator Gar into waters of the state. Although Illinois did not receive any fry from the U.S. Fish & Wildlife Service in 2012, 37 Alligator Gar averaging 15.2 inches in length overwintered from 2011 at the Cordova Exelon Plant were stocked into an oxbow complex in the lower Kaskaskia River this year.

Survival of 2+ year old Alligator Gar was documented at Banner Marsh with the collection of two 2010 year class individuals that now average 31.4 inches in length.

On September 29, 2011, 100 Alligator Gar of the 2011 year class averaging 21.1 inches in length were stocked into the 1,200-acre Merwin Preserve at Spunky Bottoms along the Illinois River near Meredosia owned by The Nature Conservancy. An intensive study by University of Illinois – Springfield student, Nathan Grider, documented overwinter survival, a diet almost exclusively of Gizzard Shad, and tremendous growth rates. The largest of the 17 collected Alligator Gar had reached 38 inches in length and over 14 pounds at only 17 months of age.

### **Glass Shrimp may be Expanding Range Northward in Illinois**

Last summer (August 2012), biological surveys conducted by the Lake County Forest Preserves District (LKFPD) found specimens of glass shrimp (*Palaemonetes kadiakensis*) from the upper Des Plaines River in Lake County. Usually associated with well vegetated rivers, swamps and

backwaters in southern and central Illinois, this crustacean has rarely been found in Illinois' interior waters north of Interstate 80. According to INHS's database, this marks the third such collection ever, with the previous ones from 2000 (Kankakee River) and 2002 (Wolf Lake, Cook County). According to LKFPD biologist Jim Anderson, this collection may be an indication of improving water quality, perhaps owing to better stormwater management, in this area.

IDNR Fisheries stream biologist Steve Pescitelli postulated that the species may have been present for a while and has likely benefited from recent wetland restoration efforts in north-eastern Illinois. Climate change could be another factor but more data, involving multiple species, would be helpful in corroborating this. At any rate, the apparent range expansion of this native invertebrate appears to be a positive development given its habitat needs (relatively clear, well vegetated water). This is particularly true in the Des Plaines River where fisheries data also reflects significant recovery in recent decades. *Excerpted from 2/5/2013 Chicago Tribune*

### **Endangered Mussels Relocated to Former Illinois Habitats**

Beginning in 2005, the Illinois Natural History Survey (INHS) has partnered with the U.S. Fish & Wildlife Service (USFWS) and state agencies in Pennsylvania and Ohio to help implement portions of the USFWS' recovery plan for the northern riffleshell (*Epioblasma rangiana*) and clubshell (*Pleurobema clava*). Both species are Federally Endangered and were historically present throughout the Ohio River drainage, including the Vermilion River of the Wabash drainage. Their range-wide declines were not attributed to one problem, but rather a combination of issues that reduced habitat and water quality, including impoundments, siltation, pollution, stream dredging, and exotic species.

This past August (2012), a team of researchers led by Kevin Cummings and Jeremy Tiemann of INHS traveled to the Allegheny River in northwestern Pennsylvania where about 4000 mussels were removed from a section of river slated for a bridge replacement project. Of these, about 1200 northern riffleshells and 200 clubshells were transported in coolers to holding tanks at the University of Illinois campus. They were subsequently fitted with Passive Intergraded Transponder (PIT) tags and placed into suitable habitats in the Salt Fork Vermilion River and Middle Fork Vermilion River. Each of these streams have multiple areas in conservation ownership and support diverse and highly-valued mussel assemblages and populations of the known fish hosts.

Survivability during the quarantine period was excellent (< 20 mortalities) and an October survey found 65% of the transplanted Unionids despite high water and these species' propensity to burrow deeply into the streambed. Another survey is planned soon under lower water conditions. Future plans include regular monitoring of sites several times over the next five years. This study is one of the first to determine if translocation is a viable option for bridge replacement projects.

*Contributed by Jeremy Tiemann, Illinois Natural History Survey*

### **A New Mussel Species for Illinois**

Tiemann, Cummings, and Schwegman added another species to the Illinois list of mussels this year. They found the Bankclimber (*Plectomerus dombeyanus*) in the Ohio River. This species is common in the south, including the lower Mississippi and Kentucky Lake. They found two fresh-dead individuals last year, which is the first time it has been documented in the state.



## **Iowa Chapter Report**

March 26, 2013

Greg Gelwicks

Iowa DNR Fisheries Research

### **Turkey River Watershed**

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I think the biggest news up this way is the formation of the Turkey River Alliance and Turkey River Authority within the Turkey River Watershed Basin. The Alliance <http://turkeyriver.org/watershed-alliance/> is modeled after the successful 640,000 acre Upper Iowa River Watershed Project, which was coordinated by Northeast Iowa RC&D, brought together dozens of partners and secured millions of dollars for private lands conservation in the UIRW. The Turkey River Watershed Alliance is an informal partnership between local, state, and federal organizations, resource professionals, and volunteers who see the Turkey River Watershed as a valuable economic and natural resource and are working to improve water quality and reduce flood risk. The Turkey River Watershed Management Authority <http://turkeyriver.org/watershed-management-authority/> was formed in June 2012 and is a board of directors from twenty three cities, five counties, and seven soil and water conservation districts (SWCDs) in the Turkey River Watershed who have voluntarily agreed to work together in order to:

- assess and reduce the flood risks,
- assess and improve water quality,
- monitor the federal flood risk planning and activities,
- offer education to residents of the watershed regarding flood risks and water quality, and
- allocate moneys made available for purposes of water quality and flood mitigation in the watershed

These entities bring together multiple entities and the people of this large watershed on a never before seen scale in Iowa. Because of the formation and activities of these two groups, the Turkey River Watershed was recently selected for an in depth study by the Iowa Flood Center. Part of this study involves demonstration watersheds that will implement multiple practices aimed at reducing flooding by >30%. As part of this project NASA will be installing more than 20 real time rain gauges within the watershed that will aid in development of both discharge and water quality models within the row crop dominated landscape to address how current landuse practices are affecting the river.

### **University of Northern Iowa Research**

Contact: Dr. Peter Berendzen, (319) 273-7026, [peter.berendzen@uni.edu](mailto:peter.berendzen@uni.edu)

We have a State Wildlife Grant to examine the genetic diversity, habitat preferences, environmental stressors and potential impact of future climate change for black redhorse,

*Moxosotoma duquesnei*, and longnose dace, *Rhinichthys cataractae* distributed in rivers and streams of northeast Iowa. The study uses a multidisciplinary approach combining population genetics, stream ecology, and ecological niche modeling to provide the necessary information for better management of the two species and native fishes distributed in this region.

### **Iowa State University Research**

#### **Fish Species of Greatest Conservation Need in Iowa's Non-Wadeable Rivers: Distribution, Relative Abundance, and Relations with Instream Habitat and Potential Movement Barriers**

*Timothy Parks<sup>1</sup>, Michael Quist<sup>2</sup>, and Clay Pierce<sup>3</sup>*

The first objective in this project was to determine the historic changes in fish distributions and in fish assemblage structure. To accomplish this objective, comparisons of species occurrences in five focal river systems were made between a historic and a recent assessment period. Trends in the distribution of 126 species were judged using iterative resampling methods and changes in species composition were determined using multivariate approaches. As expected, temporal changes in fish assemblage structure were apparent across rivers, yet the magnitude of these changes varied within and among river systems. Fish assemblages in the Des Moines, Iowa, and Cedar rivers showed significant temporal change in species composition; whereas species composition exhibited little change (i.e., potential persistence) in the Wapsipinicon River and the changes in the Maquoketa River were inconclusive. Among these rivers, the species in the Des Moines River showed the most decline (~50% of its species). With the exception of the Maquoketa River, spatial patterns of temporal turnover have indicated that the majority shifts in species composition have occurred in lower reaches of these rivers which are connected to the Mississippi River. Species that have declined across river systems were primarily characterized as backwater-phytophilic species and some fluvial specialists; whereas, species that have expanded their occurrence were mainly characterized as macrohabitat generalists. Findings from this study can aid in re-evaluating the conservation status of riverine fishes in Iowa and help to reprioritize conservation efforts needed for monitoring and rehabilitating specific lotic habitats.

The second objective of this project was to evaluate the influence dams and other environmental characteristics on fish assemblage structure in nonwadeable rivers. In the 2010 and 2011 field seasons, comprehensive fish assemblage and environmental data were collected from 33 sample reaches in the Cedar and Iowa rivers. These data were analyzed using canonical correspondence analysis (CCA) to identify associations between fish assemblage structure and environmental variables operating across multiple spatial-scales (reach-scale, dam-related, and landscape-scale). Separate CCAs (11 models) were created for each gear type and assemblage descriptor (taxonomic and functional). Partial CCAs were then used to partition assemblage variation explained by the environmental variation associated with each spatial-scale and by individual environmental variables. Partial CCAs indicated that fish assemblage structure was explained by reach-scale habitat characteristics in 11 models and by dam-related and

landscape-scale characteristics in 9 models. Despite the contributions from dams and the landscape, assemblage variation was mostly explained by reach-scale habitat in the majority of models. Mean annual discharge and percentage of shoreline rip-rap were amongst the reach-scale variables that explained highest proportions of fish assemblage variation. In particular, discharge gradients largely corresponded to variation in life history strategies. Although reach-scale habitat accounted for a high proportion of fish assemblage variation, dams and landscape still accounted for considerable amounts of assemblage variation. Important dam-related variables such as mainstem fragment length and distance to downstream impoundment provided consistent explanations of taxonomic and functional patterns not explained by reach-scale habitat. Additionally, the distribution of several species were determined to be truncated by dams in both rivers (eight in the Cedar River and 11 species in the Iowa River) indicating that dams are acting as barriers to fish dispersal.

Questions about this project should be directed to Timothy Parks (tparks@iastate.edu), Michael Quist (mcquist@uidaho.edu, (208) 885-4064), or Clay Pierce (cpierce@iastate.edu)

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### **Aquatic Invasive Species (AIS) in Iowa Rivers and Streams**

Contact: Kim Bogenschutz, 515-432-2823 ext. 103, [kim.bogenschutz@dnr.iowa.gov](mailto:kim.bogenschutz@dnr.iowa.gov)

The U.S. Army Corps of Engineers, Minnesota DNR, Wisconsin DNR, Iowa DNR and National Park Service staff collected zebra mussel veliger samples from the Upper Mississippi River and selected tributaries during July and August 2012 to monitor trends in veliger abundance and peak production. In Iowa, DNR staff collected samples below Lock and Dam 14 and from the Maquoketa, Wapsipinicon, Iowa, and Cedar Rivers. Lake Delhi was infested with zebra mussels before the dam failed in 2010 and eliminated the former lake on the Maquoketa River. No zebra mussels were observed in the river channel within the former lake in 2011 and 2012 and no veligers were detected during the systematic sampling. Similar to the Maquoketa River, the Cedar River has the influence of Clear Lake on its zebra mussel population. During high water, the outlet of Clear Lake flows into Willow Creek and then to the Winnebago, Shell Rock, and Cedar Rivers. Low densities of veligers have been collected from each of those rivers during past sampling. It is unknown if the veligers came from Clear Lake, or if there are adult populations within these rivers. Adult zebra mussel and veliger sampling in the Cedar and Shell Rock Rivers was not completed in 2012 due to the drought conditions.

Bighead carp have been reported throughout the Mississippi and Missouri Rivers and in large and small tributaries of both in southern and central Iowa for over 10 years. Prior to 2011, silver carp had only been found in the Missouri River, Big Sioux River, Mississippi River, Des Moines River as far upstream as the Lake Red Rock dam, and Chariton River below Rathbun Lake. The major flooding along the Missouri River in 2011 allowed both bighead and silver carp to expand their ranges into oxbow lakes (i.e., Desoto Bend, Snyder Bend), the Little Sioux River and its tributaries, and natural lakes in the Little Sioux River watershed (i.e., East Okoboji, Elk, Lost Island, Spirit, and below Trumbull). Large numbers of silver carp were again observed throughout the spring and early summer of 2012 jumping below the Lake Red Rock and Rathbun Lake dams. As water

levels declined, the numbers of silver and bighead carp below the dams also declined. DNR-AIS staff conducted egg and larval surveys for Asian carp below Lake Red Rock during the spring and early summer of 2012. No eggs or larval fish were collected before low water levels halted sampling efforts. A new state record bighead carp was caught by an angler from Rathbun Lake in July 2012. It weighed 93.5 pounds and was 18 years old. No other Asian carp have been collected from within Rathbun Lake.

### **Stream Biological Assessment – 2012/2013**

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Iowa Department of Natural Resources, Watershed Monitoring and Assessment Section, Stream Bioassessment Program.

<http://www.iowadnr.gov/Environment/WaterQuality/WaterMonitoring/MonitoringPrograms/Biological.aspx>

The Iowa DNR Watershed Monitoring and Assessment Section (IDNR-WMAS) and the State Hygienic Laboratory (SHL) Limnology Section continue gathering benthic macroinvertebrate, fish assemblage and stream habitat data throughout the State to assess the biological condition of Iowa's rivers and streams in accordance with Federal Clean Water Act monitoring and reporting requirements. The bioassessment program currently has three primary focus areas: 1) status and trend monitoring; 2) reference (benchmark) biological criteria development; and 3) impaired stream assessment.

#### Status and Trend Monitoring

Status and trend monitoring continues according to a five-year rotational schedule established for approximately 100 *wadeable stream reference sites*. Approximately 20 wadeable reference sites are sampled annually across the state and are stratified by ecoregion, size and other site characteristics. In 2012 and 2013, the number of wadeable reference sites sampled was increased to approximately 30/year to try to catch up and get back on a five-year rotation. In the next few years, the current population of wadeable reference sites, along with other sites that have been sampled historically, will be reviewed to see if changes (additions and/or subtractions) need to be made to the wadeable reference site population.

#### Reference condition development

The focus of *reference condition development* work in 2012 and 2013 continued/continues to be sampling candidate reference sites representing *small (headwater) warmwater perennial streams*. More intensive sampling was conducted in 2012 (and will again in 2013) on headwater streams than has occurred in the past. However, the increase in proposed sampling intensity in 2012 was negated by the drought conditions and may be again in 2013.

A report on the *coldwater stream benthic macroinvertebrate IBI (CBI)* has been finalized and will be available from the IDNR bioassessment web site in 2013.

Additional sampling data collected at coldwater stream sites in 2012 and 2013 will be used to evaluate the performance of the CBI.

Also in 2012, the IDNR Bioassessment program resumed work on a **nonwadeable river benthic macroinvertebrate IBI**. Benthic macroinvertebrate samples were collected in nonwadeable rivers across the state at both existing and new sites. The nonwadeable BMIBI development will continue in 2013.

Work is also progressing on *Bionet*, the new *internet database (when online – the address will be <http://iowadnr.gov/bionet/>)*, which will store and provide public access to data from the IDNR's stream bioassessment program. The database currently resides on a development server located behind the firewall while improvements and functionality continue to be added. When it is completed in 2013 (April?), the database will be moved to the IDNR's production server where raw and summarized sampling data for benthic macroinvertebrates, fish, and stream habitat from 1994 to the present will be accessible.

#### Impaired stream assessment

In conjunction with intensive water quality monitoring, bioassessments at several impaired stream segments will be completed in 2013 as part of the *Stressor Identification (SI)* process. The SI process is used to identify the primary causes of stream aquatic life use impairments and often leads to development of a Watershed Improvement Plan or TMDL designed to improve stream conditions and achieve water quality standards. Streams in which SI-related data analysis work will be completed in 2013 include: Middle Fork Grand River, Ringgold Co.; Peck Creek, Clayton Co.; Willow Creek, Clay Co. and Wapsipinicon River, Mitchell Co.

In 2012, fish assemblage sampling was conducted in 3 stream segments needing *status updates* following *fishkill events* that occurred several years ago resulting in Section 303(d) impairment listings for aquatic life uses. In 2013, IDNR WIS and WMAS sections plan on sampling 4-6 streams needed status updates due to fish kills.

In 2012, ~25 potentially biologically impaired streams were sampled to determine their status.

In 2013, another 25-30 potentially biologically impaired streams will have verification sampling conducted to determine their status.

Sampling and analysis of benthic macroinvertebrate, fish and water quality data continues to be done for the development of *nutrient criteria* designed to protect *stream aquatic communities*.

#### Interior Rivers Research

Contact: Greg Gelwicks, (563) 927-3276, [gregory.gelwicks@dnr.iowa.gov](mailto:gregory.gelwicks@dnr.iowa.gov)

#### Interior river habitat and fish community assessment

We are finishing our inventory and evaluation of interior river and stream habitat conditions and fish communities. Data collected for this project is being used to help build a statewide GIS database that will integrate existing and future information related to rivers and streams in the state. Data collection over the past several years has focused on non-wadeable streams. Work has begun on the completion report which is expected to be finished by fall 2013.

#### Response of fish and habitat to stream rehabilitation practices in Iowa's interior rivers

A new study began in 2010 to evaluate river and stream rehabilitation practices in Iowa. This study will help to develop management guidelines for use of stream rehabilitation

practices to improve river and stream habitat and fishing opportunities for Iowa anglers. The first project that we are evaluating is the modification of the Vernon Springs Dam on the Turkey River at Cresco, IA. The dam was converted into a series of rock arch rapids in late July 2010 to address safety and fish passage concerns. Fish community and habitat sampling was completed at three sites above the dam and two sites below the dam. Over 4,400 game and non-game fish were marked below the dam to monitor fish movement over the new structure. Fish community and habitat sampling was also completed at three sites on the Volga River that will serve as control sites for the three upstream sites on the Turkey River. Post-construction sampling of the impoundment above the dam detected 11 black redhorse, 9 golden redhorse, 3 walleyes, and 1 northern hogsucker that moved upstream over the structure. Smallmouth bass and black redhorse were sampled post-construction above the dam at a site on the N. Branch Turkey River where they were not detected in pre-construction.



Pre-project fish and habitat data collection began in 2012 for a dam removal on the Shell Rock River in Rockford, IA, and a proposed whitewater park and habitat improvement project at the site of the Marion Street Dam on the Maquoketa River in Manchester, IA. Continued monitoring of these projects, and investigations of additional stream rehabilitation projects will help to guide decision making and lead to improved methods, designs, and allocation of resources for improving Iowa's river and stream fisheries.

#### *Angler response to stream rehabilitation practices in Iowa*

Over the past several years, there has been increased interest in modifying and removing aging, low head dams on Iowa's interior rivers. This interest is driven by safety/liability concerns, deterioration of existing dams, and a desire to increase river recreation opportunities. Areas below dams are often popular fishing locations. One common concern about dam removal or modification projects in Iowa is that they will negatively impact angling, particularly below the dam. The impact of dam removal or modification on angling has not been studied in Iowa, and there is little information on this topic available from other states. Solid information on the impact of dam removal and modification on angler use, catch, and harvest is needed to inform decision makers for future projects.

A whitewater park and habitat improvement project has been proposed at the site of the Marion Street Dam on the Maquoketa River in Manchester, IA. Plans call for the partial removal (~5 ft.) and modification of the dam, and building of five additional structures that will create whitewater features while also allowing fish to pass upstream. The project is also expected to improve angler access and fish habitat at the site. A roving creel survey was initiated in April 2012 to collect pre-project data on angler use, catch, and harvest on the Maquoketa River upstream and downstream of the dam. Anglers will be surveyed during the months of April-October for at least two years prior to construction, and two years after construction. The 2012 survey found that angler effort was highest in May (1529 angler hours) and lowest in October (23 angler hours). Total catch was highest for smallmouth bass, common carp, and walleye.



Measuring the impacts of a dam modification or removal project in Iowa will provide information that will help managers address angler concerns with future projects. This information may also help to identify project features which benefit anglers that can be incorporated into future projects.

### **Dam Mitigation and Rivers Program**

Contact: Nate Hoogeveen, (515) 281-3134, [nate.hoogeveen@dnr.iowa.gov](mailto:nate.hoogeveen@dnr.iowa.gov)

Links: <http://www.iowadnr.gov/Recreation/CanoeingKayaking/LowHeadDams.aspx>

### **Dam removal and modification**

Big Sioux River- Removal of the Klondike Dam and replacement with a rock arch rapids is 90% complete. Minor channel work, landscaping, and plantings remain to be completed.

Des Moines River- Rock arch rapids will be installed below the Boone Waterworks Dam. Construction is likely to begin next month.

Shell Rock River- Complete removal of the Rockford Dam is likely to be completed by mid-summer.

Stream bank restoration/low floodplain restoration

A 300 foot restoration was completed on the Jim Hanson property on the Skunk River Water Trail.

Additional projects on the Boone River Water Trail and Protected Water Area, and along the West Nishnabotna River Water Trail are in the design/permitting phase.

**Iowa DNR, Mississippi River Fisheries Research**

Contact: Royce Bowman 563-872-4976, Royce.bowman@dnr.iowa.gov

Sauger Hooking Mortality

Concerns with deep water post-release hooking mortality of sauger led to a study completed in 2012. Sauger were angled from the tailwaters of Guttenberg and Bellevue and held in a deepwater net pen to assess 72-hour mortality rates. Overall, hooking mortality was 18 percent, but rates increased with depth. Mortality rates were 7 percent for fish caught from depths of 20-29 feet, 17 percent from 30-39 ft, 25 percent from 40-49 ft, and 41 percent from depths of 50 ft or greater. Sauger length was also found to be inversely proportional to depth. That is larger sauger were caught on average at shallower depths than small sauger. Tailwater anglers can use this information to determine where they should fish. Fishing in deep water yields small sauger and a large proportion of those fish released will likely perish. Fishing in shallower water yields larger fish and a greater proportion of released fish survive.

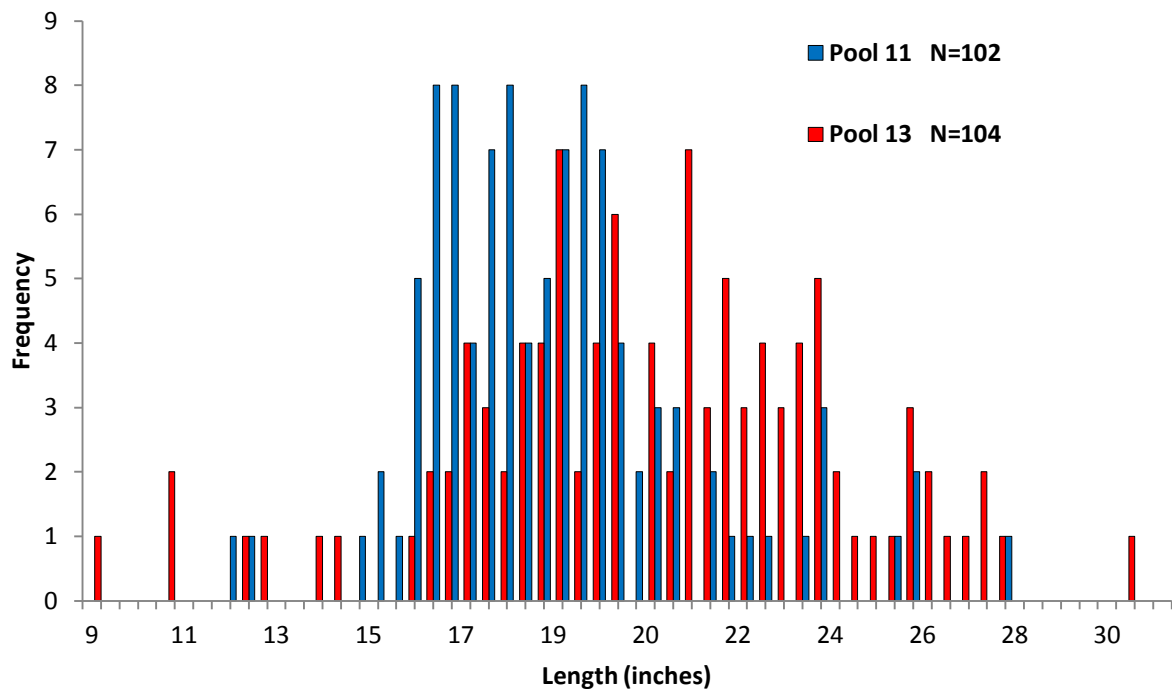




*Evaluation of walleye and sauger populations and associated fisheries in Pools 11 and 13 of the UMR.*

Evaluation of a 15 inch minimum with a 20-27 inch release slot for walleye has shown an increase of walleye in the 20-27 inch range in pools where the regulation is in effect (Pool 13) versus pools without the regulation (Pool 11). Seventy percent of the eggs produced by walleye come from fish in the 20-27 inch range. Protecting this size class to increase the number of eggs in the system may improve recruitment in the future. While PSD (% fish > 10" that are > 15") was similar between Pools 11 and 13 (95 and 94 respectively), RSD-P (% > 20") was only 21 in Pool 11 compared to 54 in Pool 13. Recommendations include continuing with the slot limit and evaluation of the walleye population as this size class increases.

Fall population surveys of walleye at Bellevue (Pool 13) and Guttenberg (Pool 11) resulted in the third consecutive year of below average catches. Poor catches may be the result of an early warm up and subsequent stable cool conditions. Walleye year class strength has been shown to correlate with water warming post spawning. Sauger catches were below average at Bellevue, but the second highest recorded since 1992 at Guttenberg.



**Length frequency histogram of walleyes collected electrofishing on wing dams in Pools 11 and 13 in summer 2012, Upper Mississippi River.**

*Evaluation of the status, distribution and habitats of northern pike in the Upper Mississippi River (UMR).*

Northern pike provide an important recreational fishery for Upper Mississippi River (UMR) anglers. Angler expectations from UMR fisheries vary greatly because anglers target this species for a variety of reasons. Some anglers target pike due to their trophy potential, while others are more consumption oriented. For many anglers, northern pike are a non-target species that they appreciate for the uniqueness that they offer to their angling experience. In order to effectively manage this fishery for this diverse angling group, this study was initiated in 2010 to provide information on northern pike population dynamics, angler opinions, and habitat availability in the UMR.

A total of 631 northern pike were sampled with fyke nets from Pools 10 and 13 in the spring of 2012. In Pool 10, 269 northern pike were collected in 37 net nights (CPUE = 7.29 fish/24 hr set) and in Pool 13, 357 northern pike were collected in 66 net nights (CPUE = 5.41 fish/24 hr set). Anal fin rays from six fish per inch group were removed for age and growth determination. All northern pike over 12 inches were tagged with an individually numbered floy tag. Additionally, radio transmitters were surgically implanted into 40 northern pike in October 2012: 20 in Crooked Slough (Pool 13), 10 in South Sabula Lake (Pool 13), and 10 at Bussey Lake (Pool 10). These fish, and 20 radio tagged at Sny Magil Bottoms (Pool 10) in 2011, will be tracked for the next several years to determine seasonal movements and habitat selection of northern pike in the UMR.



**Mississippi River Management (Fairport) Pools 16 to 20**

Contact: Bernie Schonhoff or Adam Thiese, (563) 263-5062, [Bernard.Schonhoff@dnr.iowa.gov](mailto:Bernard.Schonhoff@dnr.iowa.gov)  
[Adam.Thiese@dnr.iowa.gov](mailto:Adam.Thiese@dnr.iowa.gov)

**Habitat Improvement**

Approximately 40 cedar trees were sunk in Big Timber located in Pool 17 to provide some additional fish habitat. Cedar trees were cut from MidAmerican Energy's power generating plant near Big Timber. Trees were then sunk in the deeper dredge cuts throughout the backwater complex. GPS locations of each brush pile were taken and then posted on our website. Big Timber is a portion of the Port Louisa Fish and Wildlife Refuge and is a popular backwater fishing area in Pool 17 for bluegill, crappie, and largemouth bass.

Several meetings, conference calls and data collection trips occurred this year including a scoping meeting for the Huron Island Habitat and Rehabilitation project (HREP) as work continued with the PDT (Project Delivery Team) from the Rock Island District of the Corps. Also Bernie participated in an all day planning charrette in order to develop a timeline for the completion of planning and to commence construction. This project is being designed to raise the topographic diversity on Huron Island to provide improved habitat for mast producing trees. The project will also dredge some of the backwater habitat in order to provide enhanced overwintering opportunity for lentic fish species.

Part of the project is also designed to provide shore line protection to some of the area within the project including some of the small islands within Huron Chute.

#### Permit Reviews

A total of eight construction or sovereign land permits were reviewed and comments provided. On Dec 11, 2011 seven train cars full of coal were derailed and landed in the river near the town of Sandusky. These were cars being hauled by Burlington Northern and Santa Fe railroad. There was a mussel bed in the location of the derailment and we are still in negotiations over the recovery and subsequent mitigation required for damage to the bed of the Mississippi as sovereign land of the state. In addition, several of the other projects included impacts to mussel resources. For these permits Habitat Equivalency Analysis (HEA) evaluations were developed. The HEA process is being used to provide mitigation estimates for un-avoidable impacts to natural resources that occur when a permittee is allowed to proceed with a permit action. The HEA process allows ecological services lost to be accounted for over time and converts these to dollars for mitigation purposes.

#### Resource Monitoring

Summer random pool sampling was completed on Pools 17 and 19. There were 29 random sites sampled on each pool. Sites are divided into main channel border, side channel border, and backwater contiguous habitats. Each site is sampled for 15 minutes by electrofishing and all species of fish are collected. Some basic water quality and habitat data are collected from each site as well. Random pool sampling was started to provide some fishery trend data on our lower Mississippi Pools. Sampling is similar to what the Bellevue Long Term Resources Monitoring station does on Pool 13.

Random sampling was also completed within Huron Island this summer. Huron Island is a backwater complex located in pool 18 that is scheduled for an HREP habitat improvement projects in the future. The summer random sampling was done to provide pre-project fisheries data. Sampling will continue after the project is completed. There were 22 random sites sampled within the backwater complex. Sites are divided into side channel border and backwater contiguous habitats. Each site is sampled for 15 minutes by electrofishing and all species are collected. Basic water quality and habitat data are collected from each site as well. Fall overwintering sampling was also completed in Huron Island for crappie, bluegill, and largemouth bass. This is a nonrandom electrofishing survey to help monitor fish populations and document panfish overwintering sites within the backwater complex. Sampling typically starts once water temperature is below 50 degrees. Due to the low water conditions some of the areas normally sampled could not be accessed.

#### Aquatic Nuisance (Invasive) Species Program

Fairport Fish Management staff completed zebra mussel veliger sampling on July 12th and August 8th, 2012. Samples were taken on the lower end of the Wapsipinicon River and below Lock and Dam 14 on each date. While collecting electrofishing samples in Pool 19 this summer, management staff verified on three different occasions adult silver carp jumping while motoring to sampling sites.

### Fish Population Assessment

Shovelnose sturgeon were sampled using trammel nets in Pool 18. Shovelnose sturgeon sampling was started to monitor status of the shovelnose sturgeon populations due to commercial harvest and provide additional recapture information for the tagging project on the Cedar River. Sampling was completed in late summer when there are lower water conditions. A total of 524 shovelnose sturgeons were sampled this summer of which 7 had a tag from the Cedar River tagging project. Additionally, one sturgeon was collected that had a PIT tag. This fish was tagged by our Bellevue Fish Management Station in Pool 13 in 2007. The drought and low water conditions this summer made it very difficult to sample sturgeon. Sampling was stopped early due to insufficient current to drift the trammel nets.

Night electrofishing was completed in October for walleyes and saugers in pool 16 below Lock and Dam 15 and in Sylvan Slough. In addition this year white bass were also collected during our night electrofishing in Pool 16. The project was started due to concerns from the public about not catching as many white bass as they have in the past and information from the states of Minnesota and Wisconsin that indicates that white bass populations are low river-wide. The information collected during the project will be used to gain a better understanding of white bass populations in the Mississippi River.

### Mussels

On April 12<sup>th</sup> broodstock black sandshell and butterflies were collected from the Fairport Hatchery mussel bed out of the Mississippi River. Broodstock mussels were then sent to the Genoa National Fish Hatchery for propagation purposes. Walleye and largemouth bass were later inoculated with glochidia from the broodstock black sandshell and higgins eye mussels. On April 26<sup>th</sup>, the inoculated fish were placed in cages in the reservoir at the Fairport Fish Hatchery. On October 10<sup>th</sup>, the mussel cages were pulled from the reservoir to check for mussels which resulted in only one mussel being found. It is thought that conditions may have gone anoxic at the bottom of the reservoir causing the poor success. Also, numerous crayfish were found in each of the cages which could have caused the poor success due to predation. Next year floating cages will be used to hopefully eliminate problems with anoxic conditions and crayfish. Propagated mussels were to be used for the Pool 15 Mussel Augmentation Project.

### **Dam Mitigation and Rivers Program**

Contact: Nate Hoogeveen, (515) 281-3134, [nate.hoogeveen@dnr.iowa.gov](mailto:nate.hoogeveen@dnr.iowa.gov)

Links: <http://www.iowadnr.gov/Recreation/CanoeingKayaking/LowHeadDams.aspx>

### **Bellevue LTRMP station**

Contact: Mel Bowler, (563) 872-5495, [melvin.bowler@dnr.iowa.gov](mailto:melvin.bowler@dnr.iowa.gov)

### **Pool 13 - Fish Stuff:**

Aside from working with very low water throughout most the sampling period, all 300 samples were completed on time. Excluding hybrids, the total number of fish collected was 18,310. Number of species observed in 2012 – 55. No new species of record to

report for the year, but we did collect three specimens of northern hogsuckers (the first since 1993), four blue suckers, and two stonecat.

The number of species collected to date from LTRMP in Pool 13 is on hold at 88. The five most numerically abundant species collected in 2012 were: gizzard shad, bluegill, emerald shiner, largemouth bass, and mimic shiner. Species collected that have special status in Iowa included one hundred and forty weed shiners. No bighead or silver carp were observed or collected within the pool.

### **Channel catfish**

Catch rates of channel catfish in our small hoop nets a smidge below the twenty-one year median this year. Channel catfish catches in 2009-2012 were below average following excellent collections from 2007 and 2008. Like last year, we failed to see big numbers of those strong year-classes of age-0 fish we detected in 2005 and 2006 this year, although the abundance of larger sized catfish (PSD) has remained good over the last five years. Anglers as well as commercial fisherman should have another year of decent catfishing in 2013 in Pool 13. Channel catfish had another decent spawning season in 2012. Trawling in Pool 13 tailwaters for age-0 channel catfish (< 4 inches) yielded an above average 5.5 fish/haul.

### **Crappie *spp.***

Catches of black and white crappie in Pool 13 backwater fykes nets had been sub-par since 2005. In 2012, black crappie abundances were second highest on record and ranked first since we moved to stratified random sampling in 1993. White crappie catches were a little above average in 2012, but were two to four times the catch rates of the previous five years.

### **Largemouth bass**

The abundance and condition of largemouth bass populations in Pool 13 were outstanding in 2012, with no apparent ill affects of LMBV. The backwater day electrofishing catch rate of largemouth in 2012 (21.9 fish/15 min.) was the second highest for the period of record.

### **Shovelnose sturgeon**

Tailwater trawling catch rates for shovelnose in 2012 were outstanding, averaging roughly three and a half times the catches of last year. Trawl yields for shovelnose sturgeon averaged 12.7 fish/haul, and this was well above the twenty-two year median of 2.0 fish/haul.

Last year we made multiple collections of age-0 fish which attributed to 45% of the total sturgeon catch in our trawls. Looks like we had excellent recruitment of last year's age-0 class this year, as the majority (85%) of the sturgeon we collected were age-1 fish (12-15 inches); however the spawn was comparatively light in 2012.

### **Pool 13 – Water Quality Stuff:**

Standardized water quality monitoring was conducted at randomly selected sampling sites in Pool 13 and at fixed-site sampling in the mainstem and tributaries of Pools 12, 13, and 14 in 2012. Over 12,300 water quality observations were recorded using 20 parameters during this span. Annual long-term trend data from stratified random sampling collections in backwaters, impoundment, main channel, and side channels on Pool 13 from 1994-2011 (all periods; i.e., spring, summer, fall, and winter) indicates variable but flat trends of suspended solids, total nitrogen (one exception - winter), total phosphorus, and turbidity.

### **Pool 13 - Vegetation Stuff:**

Standardized vegetation monitoring was conducted at 450 sites randomly distributed within Pool 13, for aquatic vegetation. Despite lower than normal water levels during the sampling season, all 450 sites were sampled. Thirteen species of submersed vegetation and two species of rooted floating vegetation were sampled in 2012. No new species of aquatic vegetation were observed in 2012. Of the submersed plant species observed in Pool 13, six of the more prevalent species (coontail, curly-leaf pondweed, elodea, myriophyllum, sago pondweed, and vallisneria) were chosen to examine long-term abundance trends (frequency of occurrence) by stratum from 1998-2012 (Figure 1). Coontail exhibited a long-term increase over time in all strata, but has been decreasing since 2011. Curly-leaf pondweed has been highly variable from year to year in backwaters, but has shown an increase in frequency since 2004. Elodea and myriophyllum have been highly variable in backwaters and in the impounded portion of Pool 13, but have shown to be increasing in main channel borders and side channels since 2004. Trends for sago pondweed showed low variability in frequency of occurrence from 1998-2006 in all strata, but have been somewhat more variable since. Vallisneria has increased steadily in frequency since 1998 in all strata, and has especially increased in the impounded portion of Pool 13.

Trends in submersed aquatic vegetation have shown an increase in frequency in all strata since 2003. The main increases in frequency of submersed aquatic vegetation occurred from 2004-2008; however from 2009-2012 increasing trends leveled-off, but they were still detected at higher frequencies from the trends observed from 1998-2003.

### **Pool 12 HREP stuff:**

In late October 2012, the Bellevue LTRMP and Fisheries Management stations completed a seventh year of electrofishing and fyke netting for the Pool 12 HREP fisheries evaluation. We will be focusing on changes in the abundance, size structure, and condition in fishes among three HREP backwaters in Pool 12 versus three non-HREP Pool 12 backwaters (pre- versus post-HREP) with Pool 13 data serving as an overall point of control (a control for natural variation).

In 2009, we felt it would be beneficial to examine the age and growth of black and white crappie in Pool 13 to tie-in with the Pool 12 HREP and the white crappie telemetry projects. Similarly to the bluegill analysis in the six Pool 12 study lakes, we assigned ages to the two species by year for the respective lakes to get some perspective of crappie mortality. Ages were then pooled across these six backwaters for the initial six years

because we could not consistently acquire mortality estimates for species/backwater combinations on an annual basis. Ages are expressed as relative frequency within a particular backwater. Mortality estimates were obtained for both species per lake (ages 2-6, and ages 1-5 for white crappie in Frentress Lake), excluding crappies in Sunfish and Wise lakes.

What we've seen so far is both species appear to be fully recruited to our fyke nets by age-2, with the exception of white crappie (age-1) in Frentress Lake. Black crappie mortality is lowest in Frentress (although abundance is comparatively low) and highest in Fishtrap. White crappie mortality is lowest in Fishtrap (again, abundance is comparatively low) and highest in Frentress. White crappie mortality is slightly higher than is black crappie mortality in Stone, and in Greens mortality is essentially the same for both species. Sunfish and Wise lakes seem to have less than ideal habitat requirements for these two species based on the lack of their abundances in our fyke net catches in the fall.



**North Central Division – American Fisheries Society  
Rivers and Streams Technical Committee  
Steven Schainost – Chapter Representative**

**Activities related to Rivers and Streams in Nebraska**

**Nebraska Department of Environmental Quality, Surface Water Assessment Programs**

The Surface Water Unit collects physical, chemical, and biological water quality samples from streams and lakes, implements surface water improvement projects, and prepare surface water quality reports. Several monitoring programs collect stream and lake samples throughout the state; however, most monitoring is focused in two or three river basins each year in conjunction with a rotating basin monitoring strategy. Targeting resources in this manner improves NDEQ's ability to identify and remediate water quality problems and allows resources to be focused where they can produce the greatest environmental results. During a six-year cycle, all 13 river basins in the state are intensively monitored. Monitoring data are used to document existing water quality conditions, assess the support of beneficial uses (such as aquatic life, recreation, and public drinking water supply), and prioritize water quality problems. The current six-year basin rotation monitoring cycle is:

- 2011 -- White River-Hat Creek, North Platte and South Platte River basins;
- 2012 -- Big Blue, Little Blue and Republican River basins
- 2013 -- Middle Platte and Loup River basins
- 2014 -- Niobrara River basin
- 2015 -- Lower Platte and Nemaha River basins
- 2016 – Elkhorn and Missouri Tribs. basins

During 2012, we sampled 35 sites in the Big Blue, Little Blue and Republican River basins as part of the Stream Biological Monitoring Program (SBMP). Due to the drought and resulting low water levels in 2012 many of the randomly selected sites in these basins had to be moved to accommodate sampling for fish and aquatic macroinvertebrates.

In addition to the SBMP, NDEQ also conducts the following programs: Ambient Stream Monitoring, Basin Rotation Monitoring, Fish Tissue Monitoring, Public Beach Monitoring and Ambient Lake Monitoring. Reports and summaries of these activities can be found on NDEQ's new website address: [www.deq.ne.gov](http://www.deq.ne.gov)

**Nebraska Game and Parks Commission**

**Missouri River Program:** Gerald Mestl heads up this program assisted by a large staff, which monitors several aspects of the Missouri River. The unprecedented flood of 2011 presented a whole new suite of challenges and opportunities. Future work should reveal much new information on the impact of floods on big river fisheries

**Missouri River Natural Resource Committee/Nebraska Game and Parks:** Under a contract with River Ecosystems, Inc., another year of sampling the relative abundance and composition of larval fishes in the main channel of the Missouri River was accomplished.

**Rivers and Streams Program:** Steve Schainost heads up this program which deals with several aspects of our interior rivers and streams. This includes fish passage projects, Instream Flow, and stream monitoring along with maintenance of databases on fish, crayfish and mussel collections.

Last fall, I spent some 6 weeks catching up on my data entry into my fish distribution database. Added some 3,200 records that included a large batch of FWS data from the Niobrara River and Missouri River as well as some older Missouri River data from Mestl's crews.

In 2012, we (NGPC) have begun a joint program with South Dakota to work in the Keya Paha River basin. The focus of this is land management activities designed to remove nuisance species (like cedars) and riparian lands protection to improve wildlife and fishery habitats. The plan for 2013 is to do intensive sampling to re-assess the status of Tier I and II fishes in the basin.

**Instream Flow:** The MesoHABSIM study to quantify instream flow needs for fish was completed for the Niobrara River. The next step is to utilize this information to obtain appropriations to maintain the fish community.

An official NDNR letter was received that the 15 year review of NGPC Platte River instream flows will be up for review in 2013.

**Corps of Engineers:** The Missouri River mitigation project under the Missouri River Recovery Program continues to purchase high risk, flood prone lands on a willing seller basis. Purchased lands are in the old meander belt and development actions include connecting them back to the main channel. Monitoring of sites has been underway to assess their productivity to the ecosystem.

## **University of Nebraska at Lincoln**

### **Current Research Projects**

#### **Platte River Sturgeon Population Dynamics**

The University of Nebraska initiated a five-year study in 2009 to gain an understanding of shovelnose sturgeon populations in the lower Platte River system (lower 100 miles). Specifically, research crews are deploying trammel nets and trotlines seasonally to assess shovelnose sturgeon population dynamics, habitat use, movement patterns, and spatial distribution. Each sturgeon collected receives two uniquely coded tags (T-bar anchor and PIT tag) and the leading-edge of the pectoral fin is removed for age and growth analysis. Mark/recapture techniques will be utilized to estimate population size as well as parameters such as survival, movement, and capture/ recapture probabilities. Information gained on the factors driving population dynamics of sturgeon will be important for increased effectiveness of management activities for these species in riverine systems throughout the state of Nebraska and the remaining sturgeon distribution to maintain viable populations.

#### **Platte River Catfish Population Assessment**

The Platte River catfish population assessment continues to monitor catfish populations throughout the Central and Lower Platte River. We are also conducting a mark-recapture experimenta near Fremont and Louisville and other areas of the Platte River to help us identify movements, angler exploitation and identify overwintering areas. This study will allow us continual monitoring of catfish throughout the Central and Lower Platte River, as well as help us estimate population size, mortality and survival rates, angler harvest, fish movement, and seasonal fishing effects.

### **Ecology and Management of Catfish Populations in the Missouri River**

In July 2009, the University of Nebraska – Lincoln (UNL) began a five year research project studying the dynamics of channel catfish and flathead catfish populations in the portion of the Middle Missouri River (MMR) bordering Nebraska. The goals of this project are to

- 1) determine the present status of channel catfish and flathead catfish populations,
- 2) determine the importance of selected tributaries (Platte River, and Niobrara River) to catfish populations in the MMR and
- 3) develop population models to estimate population parameters such as population size, survival, detection probability, etc.

### **Missouri River Ecology**

Paddlefish Population Dynamics in the Lower Missouri River Basin  
Blue Sucker Movements and Habitat Use  
Response of Aquatic Biota to Woody Vegetation

### **Aquatic Nuisance Species**

Control and Management of Bighead and Silver Carp

### **Fisheries Management**

Age and Growth Validation Techniques

### **Niobrara River**

Fish Community Composition and Structure - In determining the riverine habitat characteristics and the habitat required for various faunal species within the basin, we utilized the Mesohabitat Simulation Model (MesoHABSIM). It consists of a data collection strategy and analytical techniques that allow the user to compute how much habitat is available for selected fauna under specific environmental circumstances. The changing spatial distributions of physical attributes of a river, as a result of variations in flow and the biological responses of aquatic species to these changes, provide the basis for simulating the consequences of ecosystem alteration, and consequently the justification of restoration measures. MesoHABSIM modifies the data acquisition technique and analytical approach of similar models by changing the scale of resolution from micro- to meso-scales. Mesohabitat types are defined by their hydromorphological units (HMUs - such as pools and rapids), geomorphology, land cover and other hydrological characteristics. Mesohabitats are mapped under multiple flow conditions at numerous sites along the river. Fish data were collected in randomly distributed mesohabitats where habitat surveys are also conducted. The purpose of the habitat surveys is to determine the spatial proportions of mesohabitat units within selected sections.

Mark Pegg

Associate Professor

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### **Influence of Trout Stockings on Tier I/II Fishes**

This project began in 2011 with the purpose of providing the scientific information necessary to determine the likely outcomes of stocking trout in streams containing species of concern in Nebraska. The objectives of the project are to:

- 1) provide a manuscript describing current knowledge of potential interactions of trout and species of concern,
- 2) provide a field inventory of catch by location of trout and species of concern in Nebraska, and
- 3) conduct an experiment using in-stream enclosures to examine potential competitive or predatory interactions among trout and species of concern.

Dr. Kevin Pope  
Assistant Unit Leader - Fisheries  
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### **University of Nebraska at Omaha**

We have been continually monitoring the fish community in the lower Elkhorn River at the T.L.Davis Preserve since 2005. The Davis site is located 1/4 mile south of the Q Street Bridge over the Elkhorn river on the east bank. It was donated to the university as an ecological study area in 2005, and it includes that portion of the river as well as about 25 acres of upland habitat. So far we have documented the presence of 28 fish species, including good quantities of 0 age class blue catfish each year. This is one of the only sites I have found that has a good yearly natural reproduction of blue catfish, *Ictalurus furcatus*.

In 2011, we assisted the National Park Service with a fishery survey of the Niobrara River that flows through the Agate Fossil Beds National Monument. The stream formerly supported a diverse population of Brassy Minnow (*Hybognathus hankinsoni*), Central stoneroller (*Campostoma anomalum*) Creek Chub (*Semotilus atromaculatus*), Fathead Minnow (*Pimephales promelas*), Longnose Dace (*Rhinichthys cataractae*), White Sucker (*Catostomus commersoni*), Iowa Darter (*Etheostoma exile*), Plains Topminnow (*Fundulus sciadicus*), Brown Trout (*Salmo trutta*), and Green Sunfish (*Lepomis cyanellus*). A spring flood in the 1990's evidently facilitated the movement of the Northern pike (*Esox lucius*) into this section of river. As a consequence, the community has been decimated with only Creek chub, White sucker and Northern pike now present.

Richard H. Stasiak  
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### **University of Nebraska at Kearney**

We are currently examining re-introduction efforts of plains topminnow at historic sites that are now void of populations. The results of this study will help to generate a greater understanding of how to effectively manage plains topminnow and will allow NGPC to create a statewide recovery plan. Source plains topminnow were all acquired from a constructed broodstock pond and pond production at

Rock Creek State Fish Hatchery. Each of the ponds have recently completed a third year of production and an ample supply of broodstock is available for re-stocking historic locations. Seventeen specific sites have been selected for this work with 12 of these sites representing historic plains topminnow sites that currently do not have this species present. Two sites were selected from locations that represent historic plains topminnow sites with no current population and that have exhibited low or no water conditions in the past decade and three sites have established populations of western mosquitofish. We have initiated the release of available fish and will continue to monitor re-introduction efforts as well as extend stocking efforts to determine efficacy of stocking rates, timing of re-introduction efforts, and success within variable habitats and biotic communities.

Dr Wyatt Hoback  
University of Nebraska - Kearney

### **A Final Note:**

After some six years of development, UNL's Conservation and Survey Division (sometime this year??) may publish a new, comprehensive book on the Fishes of Nebraska. Authored by Dr. Ed Peters, Dr. Richard Stasiak, Robert Hrabik and Steve Schainost, it's main focus will be species accounts, new illustrations and up-to-date distribution maps.