Iowa Chapter Report

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Iowa DNR Fisheries Research

National Fish Habitat Fishers and Farms Partnership (FFP)

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The National Fish Habitat Fishers and Farms Partnership (FFP) is making progress in the Boone River watershed mainly in the White Fox Creek tributary. The Nature Conservancy (TNC) and Iowa Soybean Association are the driving forces behind this success. In most cases TNC has secured grant fund outside of FFP grant availability for oxbow restoration. They have local staff presence and have established a trust with landowners. The DNR has entered into a three year agreement with TNC to monitor species presence and relative abundance in five oxbows. Oxbow restoration has created excitement in the area and made TNC efforts in finding willing landowners easy. The Topeka shiner, a federal endangered species, historically inhabited the Boone Watershed. Recent records are few, oxbow habitat is preferred by this species and has been lost due to channel alteration and sediment deposition.

In 2014 the Iowa DNR completed two culvert modifications to perched culverts on Buck Creek a tributary to White Fox Creek; a tributary to the Boone River. Modifications made fragment habitat available to streams fishes and in particular to smallmouth bass and rock bass. Annual monitoring will take place to determine species presence and relative abundance. 2014 survey recorded both smallmouth bass and rock bass YOY and of uncommon abundance.

The Nature Conservancy (TNC) is working with local landowners to restore silted in and degraded oxbows in the Boone River Watershed. In the fall of 2014 they successfully restored 7 oxbows, bringing the number of oxbow restorations in the Boone Watershed up to 12. The 2014 oxbows were funded through the National Fish and Wildlife Foundation, EPA's 319 Lyon's Creek Project, and Coca-Cola. TNC is currently working with the Iowa DNR, USFWS-Fishers & Farmers Partnership, Iowa Soybean Association, and Iowa Geological Survey, thanks to funding through a state Conservation Innovation Grant, to quantify the benefits that oxbows can provide for wildlife habitat, water quality improvements, and water storage.

Manchester Fisheries Management Station

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Warmwater Habitat Improvement.

A rock-arch rapids was completed at the Quasqueton Dam site on the Wapsipinicon River during spring 2014 with final adjustments made during the summer low flow period. This is a city-owned dam and the goals of the project were as follows: 1) mitigate safety hazards associated with recirculating currents in the tailwater; 2) improve the aesthetics and accessibility of the site; 3) provide fish passage for improvement of fish populations and mussel populations. Fisheries provided technical support regarding fish passage and fishery development through consultation with project engineers, funding agencies, and construction contractors. Primary funding for the project was provided through an Iowa Dam Hazard Mitigation grant and a US Fish and Wildlife Service Fish Passage grant.

Figure. Rock-arch rapids under construction on the Wapsipinicon River at the Quasqueton dam site.

Manchester Management provided input or guidance for dam modification or improvement projects proposed or under construction at the following dams; Coggon Dam (Buffalo Creek), Manchester Dam (Maquoketa River), Mon-Maq Dam (Maquoketa River), Quaker Mill Dam (Maquoketa River).

Manchester fish management consulted with the City of Dubuque regarding fishery aspects of a stream "daylighting" project underway on Bee Branch. Bee Branch was routed underground through a stormwater system decades ago to reduce impacts to city and private infrastructure, but flood-related impacts associated with the system led the City of Dubuque to pursue construction of an open-channel design.

Coldwater Habitat Improvement.

A floodplain restoration project along Mill Creek in the Big Mill Wildlife Management Area began during November 2013 and was completed during May 2014. The project included excavation of approximately 7500 cubic yards of near-stream floodplain, site stabilization practices, and establishing desirable native vegetation. The purpose of this project was to restore ecological services provided by the floodplain in the upper portion of Big Mill WMA and to reduce sediment delivery to Mill Creek while improving public access along 1000' of stream. The project was completed significantly under budget with a final payout of about $53,000. This project was primarily funded through an EPA 319 grant administered by DNR Nonpoint Source Program with supplemental cost share provided by F & W Trust Fund dollars.

Figure. Big Mill before floodplain restoration

Figure. Big Mill after floodplain restoration

A herd of 64 goats were experimentally used to manage riparian corridor vegetation at Ensign Hollow Wildlife Management Area. The goal of this project was to control problematic vegetation including willows, poison ivy, and wild parsnip that limit public use during summer months and provide attractive habitat for beaver. Goats provided by a local contractor successfully removed vegetation from about 7 acres of the corridor within an approximately 8-week period, but the long-term effectiveness of this practice is still under evaluation. This project was a joint effort between Manchester Fisheries Management and NE Iowa DNR Wildlife Management.

Figure. Contracted goat herd providing riparian corridor habitat management at Ensign Hollow Wildlife Management Area (Clayton County).

Figure. Goat grazed (right bank) and ungrazed (left bank) riparian corridor along Hewett Creek trout stream at Ensign Hollow Wildlife Management Area (Clayton County).

Fish Population Assessment

Manchester management continues to monitor the Maquoketa River Catch and Release Area fishery through annual surveys of the smallmouth bass and walleye populations. The fall abundance of smallmouth bass declined following the breach of Delhi Dam during July 2010 and

has remained low during 2011-2014. Habitat monitoring data and fish data collected by the Rivers and Streams Research crew suggests that population abundance has declined in response to a loss of rocky deep-water habitat used for overwintering. These data provide valuable insight into population response following a major perturbation and underscore the relative importance of habitat versus regulations in a recreational fishery.

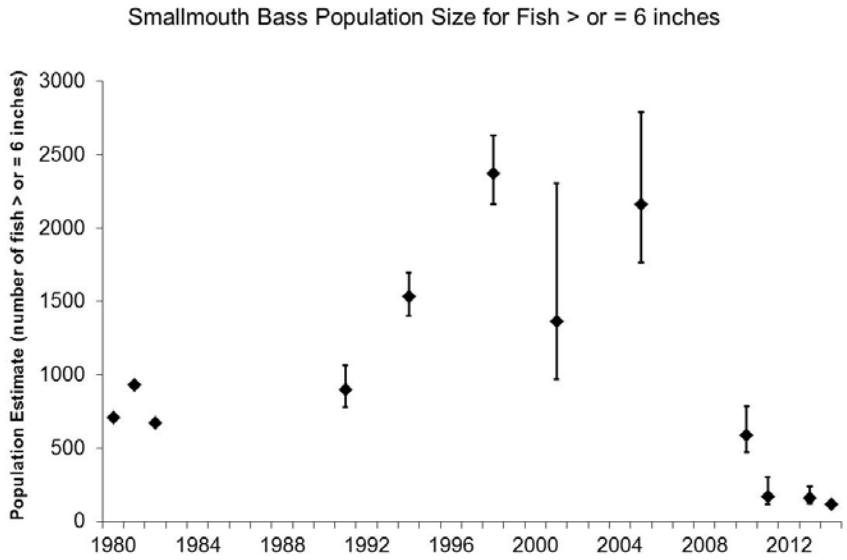

Figure. Long-term abundance of smallmouth bass in the Maquoketa River Catch and Release Area as monitored through population estimates of fish ≥ 6 inches total length.

Manchester fisheries management recovered Passive Integrative Transponder tags (PIT tags) from brown trout in Hewett Creek (Clayton County) and Spring Branch Creek (Delaware County). The tags were implanted into the abdominal cavity during 2012 and 2013 and will be used to monitor growth over time through recapture length measurements of trout and to develop population models for trout in northeast Iowa.

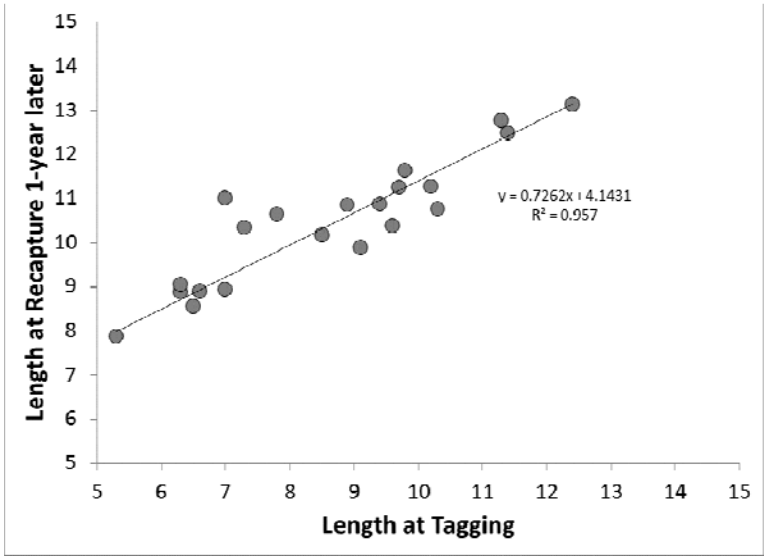

Figure. Length at capture and length at recapture 1-year later for Brown Trout implanted with PIT tags in Hewett Creek (Clayton County).

Spirit Lake Fisheries Management Station
Contact: Mike Hawkins, 712-336-1840 x116, Michael.Hawkins@dnr.iowa.gov

The Iowa DNR and Minnesota DNR have submitted a joint State Wildlife Grant Application titled "*Habitat Improvement Projects for Stream and Oxbow Fish of Greatest Conservation Need*". This project will focus on habitat restorations and responses of stream fish of greatest conservation need (SGCN), specifically Topeka shiners (*Notropis topeka*) and plains topminnows (*Fundulus sciadicus*).

Objectives

1. We will inventory and analyze known locations of Topeka shiners and plains topminnows, and watershed health in the study areas to prioritize sites (i.e. stream reaches, OCH) as potential habitats and candidates for restoration in a spatially explicit GIS environment.
2. We will identify and implement site-level habitat restoration projects on public and private lands prior to the end of this project.
3. Assess the effectiveness of conservation actions (habitat restoration) by monitoring Topeka shiner and plains topminnow presence, abundance, and genetic diversity of populations compared to connectivity and habitat response.
4. Acquire permanent protection from willing landowners on at least 50 acres of key habitat for Stream Fish SGCN.

The project will concentrate efforts on the Rock River drainage (Iowa and Minnesota) and Raccoon River drainage (Iowa).

Iowa State University Research

Asian Carp population dynamics and distribution in southeast Iowa rivers
Principal Investigators: Michael J. Weber, Clay L. Pierce
Student Investigator: Christopher J. Sullivan (M.S.)

Goals and Objectives:

- Estimate the influence of environmental covariates on occupancy and detection probabilities of Asian Carp
- Evaluate and compare temporal (e.g., seasonal and annual) trends in Asian Carp population characteristics (abundance, distribution, size structure, condition) and dynamics (growth, mortality, recruitment) among southeast Iowa tributaries and upper Mississippi River populations
- Evaluate patterns of large-scale spatial synchrony of dynamic rates (recruitment and growth) for Asian Carp populations among Midwestern Mississippi River watersheds

Introduction:
Since their introductions in the 1970s, Bighead *Hypophthalmichthys nobilis* and Silver Carp *H. molitrix* (collectively Asian Carp) have spread throughout the Mississippi River basin and become two of the most recognizable invasive species in North America. Their migration and possible establishment into higher reaches of the Upper Mississippi River (UMR) and its major tributaries is not well understood and currently southeast Iowa river systems are at the main stem Mississippi River invasion front. Presently, there is a paucity of knowledge associated with established and migrating populations at the invasion front and understanding population characteristics and dynamics and factors influencing population regulation is needed to facilitate assessment and management on a local and regional scale. To effectively monitor large-scale

range expansion, knowledge of site occupancy as well as critical environmental variables influencing detection is needed. Additionally, evaluation of spatiotemporal trends in Asian Carp local population characteristics and dynamic rates among a major tributary on the invasion front will aid in understanding dispersal characteristics, and possible establishment, into higher reaches of the UMR. Lastly, the degree of synchrony among Midwestern Mississippi River systems and the influence of climate and dispersal on Asian Carp recruitment and growth may further our understanding and aid managements understanding on local and regional mechanistic processes influencing dynamic rates, manipulating management scales for Asian Carp.

Progress:
In summer 2014, Asian Carp were collected in the Des Moines and Skunk rivers. A total of 1,148 Asian Carp were collected from April 18 to October 25. In the Des Moines River, Silver Carp made up majority of the catch (98%) while Bighead Carp only comprised approximately 2% of captured individuals. Additionally, three individuals captured were identified as Hybrid Carp. Silver Carp ranged from 450 to 880 mm (mean = 644 mm) in length and 1.2 to 7.4 kg (mean = 2.8 kg) in weight. Bighead Carp ranged from 624 to 1003 mm (mean = 840 mm) in length and 2.6 to 10.3 kg (mean = 6.4 kg) in weight. In the Skunk River, only 12 Silver Carp were captured throughout the year ranging from 631 to 899 mm (mean = 817 mm) in length and 2.6 to 9.6 kg (mean = 6.3 kg) in weight. Proportional size distribution (PSD) indices suggest Silver Carp populations are of larger size structure in downstream sites compared to upstream sites while populations above Lock and Dam 19 are larger than populations immediately downstream. Additionally, age structures of Silver Carp populations were smaller than downstream sites while Bighead Carps exhibited a reverse age structure.

Future Plans:
Additional adult sampling for Asian Carp will occur spring through fall 2015 in southeast Iowa rivers as well as among Midwestern Mississippi River tributaries.

Factors Affecting Mercury Concentrations in Iowa Fishes
Principal Investigators: Michael J. Weber, Clay L. Pierce
Student Investigator: Nathan T. Mills

Goals and Objectives:
- Develop regression models to predict the concentration of mercury in a range of fishes as a function of fish total length across natural lakes, impoundments, reservoirs, and rivers to guide consumption advisories.
- Evaluate regional (e.g., north vs south, east vs west) differences in mercury concentrations to help guide consumption advisories. Include additional biotic (e.g., age, food web dynamics) and abiotic (e.g. land use, water quality) factors in models to explain additional variation in mercury concentration not explained by fish length.
- Evaluate temporal changes in mercury concentrations in largemouth bass to guide mercury sampling protocols.

Introduction:
Mercury is naturally present in the environment but levels have increased dramatically since the 19th century due to anthropogenic emissions. Mercury concentrations in fishes can be highly variable among species and populations driven by a range of biotic and abiotic factors. Larger and older fish typically have higher mercury concentrations compared to smaller and younger individuals. Understanding fish length-mercury concentration relationships is an important component of issuing fish consumption advisories because fish length is easy for anglers to measure and understand. However, large variation in mercury concentrations within a species

and individuals of similar size is common. The majority of mercury in fish muscle is derived from dietary sources. Understanding trophic ecology and population dynamics (e.g., age, growth, mortality) are important aspects of understanding mercury concentrations in fishes.

Progress:
DNR biologists and Iowa State University personell have been collecting fish from several lakes, reservoirs, and rivers across Iowa. As of March 2015, 277 bluegill, 207 black crappie, 112 white crappie, 63 yellow perch, 150 channel catfish, 101 flathead catfish, 70 smallmouth bass, 525 largemouth bass, 32 muskellunge, 21 sauger, 335 walleye, and 92 northern pike have been collected for mercury analysis. The highest total mercury concentration detected was 2.52 mg/kg and was found in a 1204mm (47.4") female muskellunge from West Okoboji Lake, in northern Iowa, during April 2014. Of the 1700 tissue samples that have been analyzed for mercury, only 165 (~10%) have had mercury concentrations exceeding the EPA criterion of 0.30 mg/kg. While 703 (41%) of these samples have had undetectable mercury concentrations (<0.05 mg/kg).

Future Plans:
Once all samples have been analyzed for mercury, multiple regression models will be created to identify biotic and abiotic influences on mercury accumulation in Iowa fishes. Spatial relationships and lake-by-lake or species-specific contamination concerns will be identified from these models to guide further development of Iowa consumption advisories.

Aquatic Invasive Species (AIS) in Iowa Rivers and Streams
Contact: Kim Bogenschutz, 515-432-2823 ext. 103, kim.bogenshutz@dnr.iowa.gov

The annual zebra mussel veliger sampling from the Upper Mississippi River and selected tributaries that occurred from 2001 through 2013 to monitor trends in veliger production and abundance was discontinued in 2014. Lake Delhi (Delaware County) was infested with zebra mussels before the dam failed in 2010 and eliminated the former lake on the Maquoketa River. No zebra mussel adults or veligers have been found in the Maquoketa River since the Lake Delhi dam broke. The Cedar and Iowa Rivers are influenced by the zebra mussel population in Clear Lake because the outlet of Clear Lake flows into Willow Creek and then to the Winnebago, Shell Rock, Cedar, and Iowa Rivers. Low densities of veligers and individual adults have been collected from each of those rivers during past sampling. A new zebra mussel infestation was discovered in Lake Cornelia in 2014. The outlet of Lake Cornelia flows into White Fox Creek, which is a tributary to the Boone River. Zebra mussel adult and veliger sampling will be conducted in White Fox Creek and the Boone River in 2015.

Bighead Carp and Silver Carp have been reported throughout the Mississippi and Missouri Rivers and in tributaries of both rivers in Iowa for over 10 years. No new locations for Bighead or Silver Carp were reported in 2014. DNR-AIS staff sampled for Bighead, Silver, and Grass Carp in the Des Moines, Iowa, Cedar, Chariton, and Little Sioux Rivers in 2014. The highest densities continue to be observed below the Red Rock Dam on the Des Moines River and below the Rathbun Dam on the Chariton River. Young-of-the-year Grass Carp were collected in 2014 by DNR Fisheries staff in Coralville Lake below the Lake Macbride spillway and from Hoosier Creek. DNR-AIS staff also assisted with Asian carp collection for an Iowa State University research project funded by DNR-AIS to evaluate the distribution and population dynamics of Asian carp in southeast Iowa rivers. This research project will continue through 2016 in order to better understand Asian carp populations in Iowa.

DNR-AIS contracted with the University of Northern Iowa and Wartburg College in 2014 to continue a rusty crayfish (Orconectes rusticus) distribution project that started in 2013. The study area in 2013 was the Upper Cedar River Watershed where a total of 26 rusty crayfish were found scattered throughout51 survey locations on the Cedar River, Little Cedar River, and tributaries. The study area in 2014 included 50 locations on the Wapsipinicon River and Buffalo Creek. A total of 9 rusty crayfish were collected in 2014. Genetic analysis was done in 2014 for all specimen identified as rusty crayfish in 2013 and 2014. The results confirmed morphometric species identification and revealed only two haplotypes.

Iowa Stream Biological Assessment – 2014/2015

Contacts:
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Iowa Department of Natural Resources, Water Quality Monitoring and Assessment Section, Stream Bioassessment Program.
http://www.iowadnr.gov/Environment/WaterQuality/WaterMonitoring/MonitoringPrograms/Biological.aspx

The Iowa DNR Water Quality Monitoring and Assessment Section (IDNR-WQMA) 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 four primary focus areas: 1) status and trend monitoring; 2) reference (benchmark) biological criteria development; 3) impaired stream assessment; and 4) nutrient criteria development.

Status and Trend Monitoring

Status and trend monitoring continues according to a five-year rotational schedule established for approximately 100 warm water ***wadeable stream reference sites***. Historically, approximately 20 wadeable reference sites were sampled annually across the state and were stratified by ecoregion, size and other site characteristics. In 2012-2014, 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 sampling rotation. Beginning in 2015, approximately 25 warm water wadeable stream reference sites will continue to be sampled annually. 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.

Status and trend monitoring continues according to a five-year rotational schedule established for 16 ***coldwater stream reference sites*** The Iowa coldwater reference site network is sampled on a five year rotation with four sites sampled annually. A report on the ***coldwater stream benthic macroinvertebrate IBI (CBI)*** has been finalized and will be available from the IDNR bioassessment web site in 2015. In the interim, a pdf version of the report is available upon request. Additional sampling data collected at coldwater stream sites in 2012, 2013 and 2014 will be used to evaluate the performance of the CBI.

Reference condition development

The focus of ***reference condition development*** work in 2013/2014 continued/continues to be sampling candidate reference sites representing ***small (headwater) warm water perennial***

streams. More intensive sampling was conducted in 2014 on headwater streams than has occurred in the past and this sampling increase will occur again in 2015.

The IDNR Bioassessment program is continuing to work on the development of a **non-wadeable river benthic macroinvertebrate IBI**. Benthic macroinvertebrate samples were collected in non-wadeable rivers across the state at both existing and new sites in 2012, 2013 and 2014. The non-wadeable BMIBI development will continue in 2015.

Impaired stream assessment
Historically intensive water quality monitoring and bioassessments were completed as part of the ***Stressor Identification (SI)*** process. Due to budgetary constraints, future SI monitoring and development is on hold.

In 2014, fish assemblage sampling was conducted in three 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 2015, IDNR WIS and WQMA sections plan on sampling 12 streams needing status updates due to fish kills.

In 2014, 11 potentially biologically impaired streams had verification sampling conducted to determine their status.
In 2015, ~10 potentially biologically impaired streams will have verification sampling conducted to determine their status.

Nutrient criteria development
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***. A draft technical report containing draft recommendations for wadeable coldwater and warm water streams is available at http://www.iowadnr.gov/InsideDNR/RegulatoryWater/WaterQualityStandards/Nutrients.aspx.

Bionet, the new ***internet database*** **(http://iowadnr.gov/bionet/)**, is online and it stores and provides public access to data from the IDNR's stream bioassessment program. Bionet summarizes sampling data for benthic macroinvertebrates, fish, and stream habitat from 1994 to the present and continues to be updated, improved and polished on a daily basis.

Interior Rivers Research
Contact: Greg Gelwicks, (563) 927-3276, gregory.gelwicks@dnr.iowa.gov

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. Pre-construction fish community and habitat sampling was conducted at three sites above the dam and two sites below the dam. Over 3,900 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 16 black redhorse, 11 golden redhorse, 3 walleye, and 1 northern hog sucker that moved upstream over the structure. Banded Darter, Largescale

Stoneroller, Smallmouth Bass and Black Redhorse were sampled post-construction above the dam at sites on the Turkey River where they were not detected pre-construction.

Pre-project fish and habitat data was collected in 2012 and 2013 for a dam removal on the Shell Rock River in Rockford, IA. The dam was removed during winter 2014, and the first year of post-project data collection was completed in summer 2014. Preliminary results indicate a decrease in water depth and increase in water velocities both upstream and downstream of the former dam. Percent fine substrate was reduced at the site above the former dam, but increased at the site below the dam. We documented an increase in fish species in the former impoundment, and sampled two fish species (Golden Redhorse and Northern Hog Sucker) at both sites upstream of the dam that were not present prior to dam removal.

The third year of pre-project fish and habitat data collection was conducted in 2014 for a proposed whitewater park and habitat improvement project at the site of the Marion Street Dam on the Maquoketa River in Manchester, IA. Project construction is expected to be completed in spring 2015 and post-project monitoring will begin in summer 2015.

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 (~6 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 three years prior to construction, and three years after construction. During 2012, total angler effort was 4,785 hours and Smallmouth Bass, Common Carp, and Walleye were the species caught most often. Bluegill, Smallmouth Bass, and Common Carp were caught most frequently in 2013, and anglers expended 6,652 total hours of effort. During 2014, total angler effort was 4,128 hours and Blugill, Sucker sp., Common Carp, and Smallmouth Bass were caught most often.

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 in future projects.

Dam Mitigation and Rivers Program
Contact: Nate Hoogeveen, (515) 281-3134, 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 complete. An additional streambank restoration was completed in fall of 2014 with USFWS funding.

Des Moines River- Rock arch rapids was installed below the Boone Waterworks Dam.

Shell Rock River- Complete removal of the Rockford Dam was completed.

Wapsipinicon River- A rock arch rapid was installed below the dam at Quasqueton. Littleton dam modification is in the project management/permitting phase.

Maquoketa River- A whitewater park and habitat improvement project at the site of the Marion Street Dam in Manchester is in the permitting phase with expected construction in fall 2014 or winter 2015.

Turkey River- The lower dam at Elkader was removed and replaced with a loose stone whitewater feature in winter of 2013-2014.

Boone River – Goldfield Dam was replaced with a rapids in August 2014.

Buck Creek – 2 perched culverts connected with rock arch rapids for fish passage in September 2014.

Mississippi River Management (Fairport) Pools 16 to 20

Contact: Bernie Schonhoff or Adam Thiese, (563) 263-5062, Bernard.Schonhoff@dnr.iowa.gov
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Fish Population Assessment

This year we started a shovelnose sturgeon tagging project on the Des Moines River similar to the one being conducted on the Cedar River. On April 29, 2014 crews met at Ottumwa to collect shovelnose sturgeon but river conditions were high and turbid making sampling efforts difficult. Only 38 sturgeons were collected and tagged. Crews from Rathbun Fish Management, Lake Darling Management, Manchester Research, Bellevue Research, along with a crew from the Missouri Department of Conservation assisted with sampling. The Missouri Department of Conservation were sampling with a trawl all other crews were electrofishing. A second effort was attempted by Adam Thiese and Mark Flammang on May 29, 2014 and 60 sturgeons were collected and tagged by electrofishing. Tags being used are the same style of tag that is being

used on the Cedar River but with a different numbering/lettering to distinguish between the two sampling locations. The tags for the Des Moines River fish all start with the letter "D". Every fish is being tagged, measured, weighed, and if possible determine the fish's sex.

Electrofishing for white bass was completed throughout pool 16 on June 10 and 11, 2014.

Trammel netting for shovelnose sturgeon was also completed in Pool 18. Shovelnose sturgeon sampling is being done 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. This year we collected 644 sturgeon and 10 of those had tags from the Cedar River tagging project.

Night electrofishing for walleyes and saugers in Pool 16 below Lock and Dam 15 and in Sylvan Slough was completed in October. Sampling typically is done over 8 nights the second and fourth weeks in October. Due to weather and a trailer break down one night had to be rescheduled and one night cancelled this year.

Bernie and Adam assisted the Bellevue Fish Management Station with their annual shovelnose sturgeon tagging project on the Cedar River at Palisades Kepler State Park.

Collection Of Threatened, Endangered And Species Of Concern

This summer 4 Longear Sunfish were collected at the Fairport Fish Hatchery. The first Longear was collected on 7/7/2014 in a fyke net on the flooded hatchery grounds while trying to collect fish for a clinic. The lower hatchery ponds were flooded due to the high water and when the hatchery staff were finally able to drain them they found two more on 7/23/2014. We sent out photos of the new specimens to Robert Hrabik with the Missouri Dept. of Conservation and Bruce Bauer in Tennessee and they confirmed that they are Longear Sunfish. The fourth specimen was collected on 8/1/2014 by Jake Sieverding (a seasonal at the Fairport Fish Hatchery) in a fyke net set out along the hatchery grounds in the Mississippi River. Hrabik and Bauer believe they are most likely Central Longear sunfish and not Northern Longear Sunfish which will hopefully be determined by the DNA analysis.

All four specimens have had a fin clip taken from them for DNA analysis and sent to Bruce Bauer. The fourth specimen died and was preserved and sent to Bruce Bauer for use in his study of geographic variation of meristics and morphometric of Longear Sunfish. Bruce Bauer is working with a Dr. Tom Near at Yale who is working on the DNA analysis of longear and dollar sunfishes. Bruce Bauer is a Research Associate, Department of Ecology and Evolutionary Biology, University of Tennessee, Knoxville, TN. We are still awaiting the results on the DNA analysis and this may take some time.

In an effort to possibly locate additional specimens a back-pack electrofishing unit was used along the Fairport Fish Hatchery shoreline as well as in the small creek that is just to the east of the hatchery to try and find additional Longear Sunfish but no more were captured. There has been some discussion on trying to survey some of the other small streams in the area to possibly sample Longear Sunfish.

Resource Monitoring

Random pool sampling was conducted on Pool 16 and 18 this past summer. Sampling is done similar to what the Bellevue LTRM station does on Pool 13. Pool 16 was sampled during the 1st period (June 15th – July 31st) and Pool 18 was sampled during 2nd period (August 1st –Sept 15th). A total of 29 random sites are sampled on each pool. Sites are divided into main channel border,

side channel border, and backwater contiguous habitats. Each site is sampled by electrofishing for 15 min and all species are collected. We have also changed up our sampling from the past to sampling pool 18 every year and sampling pool 16 and 17 every other year. Pools 16 and 17 will be sampled during the 1st period and pool 18 will be sampled during the 2nd period. We are no longer random sampling on pool 19 because the Illinois Natural History survey is random sampling that every year and didn't feel it was necessary to duplicate the sampling. All the random pool sampling data is being sent to Mel Bowler at the LTRM station to be entered into the UMESC data base. We will have access to the Pool 19 data that Illinois is collecting through this database.

Random sampling was also completed within Huron Island this summer during the 2nd period (August 1st – Sept 15th). Huron Island is a backwater complex located in pool 18 that has a habitat improvement project currently in construction. 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 for bluegill, crappie, and largemouth bass was not completed this year due to an early freeze up and construction being done within the backwater complex.

Bellevue LTRMP station

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

Pool 13 - Fish Stuff:

Aside from working in high water levels from June and July, all 300 samples were completed on time. We collected a total of 26,075 fish in 2014, and the number of species observed was 62.

One new species of record to report for the year was pallid shiner. One hundred-nineteen pallid shiners were collected at twenty-five sites across all strata of Pool 13 in 2014. This new species of record had not been collected along Iowa's portion of the UMR in the last 50 years and the species had been considered to be extirpated in Iowa. The sudden appearance of the species in moderate numbers may be partially explained by downstream dispersions due to extreme and prolonged high water levels in the spring and summer of 2014 in the northern UMR watersheds.

With the addition of the pallid shiner, the number of species we've collected in Pool 13 is 89 since 1989. We also collected specimens of black buffalo, blue sucker, brown bullhead, golden and silver redhorse, Mississippi silvery minnow, silver lamprey, weed shiner, and white sucker in 2014. The five most numerically abundant species collected in 2014 were bluegill, mimic shiner, emerald shiner, spotfin shiner, and common carp. Species collected that have endangered status in Iowa included twenty weed shiners. No bighead, grass, or silver carp were observed or collected within the pool in 2014.

The following are a few examples of long-term abundance trends of selected Pool 13 fishes from 1993-2014. The time series figures depict annual mean catch-per-unit-effort, which are indicated by the blue circles. Twenty-one year medians are expressed as solid black horizontal lines, and 10% and 90% percentiles - orange dashed lines. Years 1993-2014 are reflective of random site sampling within various strata. With the exception of tailwater trawling, data from 2003 has been excluded because of small sample size (n=21) from the third period only.

Channel catfish

Catch rates of channel catfish in our small hoop nets were poor this year and were below the twenty-one year median. Channel catfish catches in 2009-2012 were also below average following excellent collections from 2006-2008. The proportion of healthy, catchable-sized catfish (PSD and *Wr*) has remained fairly good over the last few years however. Although size structure of fishes over 16" has been highly variable over time, the trend appears to be independent of body condition. That said, anglers and commercial harvesters should have another decent year of catfishing in 2015 in Pool 13.

Channel catfish again had a poor spawning season in 2014 relative to the larger year classes of 2005, 2006, and 2010-2012. Tailwater trawling in Pool 13 for age-0 channel catfish (<4 inches) yielded a mere 0.5 fish/haul compared to the twenty-two year median of 2.5 fish/haul.

Crappie *spp.*

Catches of black and white crappie in Pool 13 backwater fykes nets had been sub-par from 2007-2011. In 2012, we observed increased catches in both species. Both black and white crappie abundances in 2014 were lower than in 2013, and both species were also slightly below the long-term median this year.

Largemouth bass

The abundance and condition of largemouth bass populations in Pool 13 were once again very solid in 2014, with no apparent detrimental effects of LMBV (*Wr* analysis). The backwater day electrofishing catch rate of largemouth in 2014 (10.5 fish/15 min.) was just a tad below the 21-year median after peak catch rates occurred in 2011 and 2012.

Trends in mean relative weight (*Wr*; fall 2000-2014) for largemouth bass in Pool 13 are graphed below. Mean *Wr* are calculated by Gabelhouse size categories of stock to quality, quality to preferred, and preferred to memorable lengths. There was a nominal increase in mean *Wr* for all three size categories of largemouth bass compared to last year, and *Wr* values continue to be well within accepted ranges for healthy bass populations. Recreational and tournament bass anglers here have been very pleased with the numbers of 2-3 pound fish for many years now.

Shovelnose sturgeon

Tailwater trawling catch rates were again outstanding for shovelnose in 2014. Trawl yields for shovelnose sturgeon averaged 10.4 fish/haul, and this was well above the twenty-two year median of 2.2 fish/haul.

Collections of age-0 fish (≤ 9 inches) attributed to 4% of the total sturgeon catch in our trawls in 2014. We've seen excellent recruitment of the 2011 year class for the last three years; however the spawn has been toward the lighter side from 2012-2014. Size structure trends (RSD 15, 20, and 25) in shovelnose sturgeon for the years 1991-2014 are as follows: (Note – Size structure for 1993 and 2006-2008 should be viewed with caution, because of small sample size: n < 30). Naturally, the annual recruitment of the strong 2011 year-class has been driving the increase of

fishes ≥ 15 over the last two years. Fishes ≥ 25 inches contributed to 2% of the total catch in 2014.

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 2014. 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 1994-2013 (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. The long-term trend of mean total nitrogen in all strata, (and especially the backwater stratum in winter) had been increasing over time from 2008-2011. Backwater mean total nitrogen in 2012 dramatically dropped to a nineteen year low, although the variance specific to this mean was particularly high. A possible explanation for lower nitrogen levels in the winter may be related to reduced ice depths and shorter duration of ice cover relative to the last five years. In 2013, mean total nitrogen sharply rose from last year's average, and was equivalent to the nineteen year median of 2.4 mg/L. The cumulative standard error of total nitrogen in the backwater stratum was again abnormally high in the winter of 2013 (range = 0.8 – 8.7 mg/L) which indicate the existence of recent "cold spots and hot spots" in particular backwaters of Pool 13. Investigations of these winter extremities in total nitrogen will be undertaken this year to examine explanations of these occurrences.

Pool 13 - Vegetation Stuff:

Standardized aquatic vegetation monitoring was conducted at 450 sites randomly distributed within Pool 13. Thirteen species of submersed vegetation and two species of rooted floating vegetation were sampled in 2014. No new species of aquatic vegetation were observed in 2014. Of the submersed plant species observed in Pool 13, six prevalent species (coontail, curly-leaf pondweed, elodea, myriophyllum, sago pondweed, and vallsineria) were chosen to examine long-term abundance trends (frequency of occurrence) by stratum from 1998-2013* (Figure 2.1). 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. 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.

Also a summation of all submerged aquatic vegetation (pooled by year; frequency of occurrence) was examined, to get a general sense for the vegetation trends in Pool 13 over the last seventeen years. Trends in submersed aquatic vegetation (SAV) have shown an increase in frequency in backwater and the impounded strata since 2003. The main increases in frequency of submersed aquatic vegetation occurred from 2004-2008. Although frequency of SAV in backwaters and the impounded portion of Pool 13 have remained fairly stable over the last five years, frequency of SAV in the main channel borders and side channels decreased substantially in 2013.

Pool 12 HREP stuff:

In early November 2014, the Bellevue LTRMP and Fisheries Management stations completed a ninth year of electrofishing and fyke netting for the Pool 12 HREP fisheries evaluation. Once again due to low water levels we had to use the Go-Devil to shuttle nets in and out in a couple of lakes.

All data from 2014 has been entered and verified. We collected 2,675 fish of 24 species from the fyke netting segment of the study and 2,504 fish of 42 species from the electrofishing segment. Forty-three pallid shiners were documented from the pool-wide electrofishing segment in backwater, impounded, and side channel strata. Six hundred fifty-one bluegills were retained from the eight backwater fyke netting locations for aging and sexing in 2014, and we completed otolith extraction and sexing of bluegills in December. Data from aged bluegill were processed through a SAS script that randomly assigns ages to the unaged bluegill, so that we can obtain accurate age frequencies and mortality estimates for the six backwater lakes in 2014. Updated and included are some of these analyses that will give you an idea of some of the comparisons we will be looking at with this study. We will be focusing on changes in the abundance, size structure, and condition in centrarchids 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).

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Recently published a paper on Rainbow Darter in Iowa.

Davis, D. J., A. C. Wieman, and P. B. Berendzen. The influence of historical and contemporary landscape variables on the spatial genetic structure of the rainbow darter (*Etheostoma caeruleum*) in tributaries of the upper Mississippi River. Conserv Genet (2015) 16:167-179. DOI 10.1007/s10592-014-0649-1.

Also, recently completed final report for a Black Redhorse and Longnose Dace study in Iowa entitled "Establishing Demographic Parameters and Conservation Units of Fishes of Greatest Conservation Need Distributed in Northeast Iowa."