# Iowa Chapter Report

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Coldwater Streams Inventory:

From 2017 to 2020, the Iowa DNR and Iowa State University partnered to inventory coldwater stream fish communities and survey stream habitat and stream water temperatures in NE Iowa streams. In 2018, about 90 sites were surveyed with about 50 sites sampled in 2019. This data will guide trout management and be used to update Iowa coldwater stream classifications. This project should conclude in June 2020.

Genetics of Iowa Brook Trout:

The Iowa DNR, University of Wisconsin-Stevens Point (UWSP), and USFWS worked to evaluate the genetic diversity and source of Iowa's wild Brook Trout fisheries. All wild populations were sampled and genetic clips provided to Molecular Conservation Lab at UWSP. The analysis showed 1) there is no reason to believe that South Pine Brook Trout are not native to Iowa, 2) the South Pine population is relatively diverse when compared to other wild populations in MN and WI, 3) some populations restored by stocking South Pine Brook Trout could be used for future broodstock collections, 4) a couple Iowa streams could use additional Brook Trout stockings to increase genetic diversity, 5) some streams have domestic ancestry associated with previous stockings of domestic strain fingerlings, and 5) three streams stocked with Ash Creek (WI) Brook Trout have strong similarity to Ash Creek (WI). Brook Trout management has already been modified as a result of this work; Iowa no longer stocks catchable-sized domestic strain Brook Trout. Additional changes to the Brook Trout program are being considered as a result of this work.

Movement of South Pine Creek Brook Trout Research:

During 2019, Iowa DNR staff tracked movement and habitat use of 26 Brook Trout in South Pine Creek tagged with radio telemetry tags. Movement was limited with no Brook Trout moving more than a mile from their tagging location. Brook Trout selected pool macrohabitats more often than riffle or run habitats. Analysis is ongoing. This info will guide Brook Trout management decisions in the future.

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

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Bighead Carp and Silver Carp have been reported in increasing numbers throughout the Mississippi and Missouri Rivers and their tributaries in Iowa since the mid-2000s. DNR-AIS staff surveyed Bighead Carp, Silver Carp, and Grass Carp a minimal number of times in 2019 in the Des Moines, Cedar, and Iowa Rivers due to high water conditions. Silver Carp were reported for the first time in 2019 from the Maquoketa and Wapsipinicon Rivers. DNR-AIS staff continued to

monitor the condition of Bigmouth Buffalo in areas of the Des Moines River with and without Bighead and Silver Carp and added locations in the Iowa River to determine the impacts of Asian carp on this native planktivore. Continuous, high releases of water from the Rathbun Dam contributed to high reproduction and recruitment of Bighead, Silver and Grass Carp in the Chariton River in 2019.

New Zealand mudsnails have been found in Wisconsin and Minnesota; therefore, DNR-AIS seasonal staff for the Decorah and Manchester areas interacted with Iowa trout stream anglers in 2019 to provide them with information about both New Zealand mudsnails and Didymo.

The rivers and streams in Iowa where zebra mussels have been documented include the following: Mississippi River, Winnebago River, Shell Rock River, Cedar River, Iowa River, Missouri River, Little Sioux River.

**Iowa Stream Biological Assessment – 2019/2020**

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Iowa Department of Natural Resources, Water Quality Monitoring and Assessment Section, Stream Bioassessment Program. https://programs.iowadnr.gov/bionet/Docs/About

The Iowa Department of Natural Resources Water Quality Monitoring and Assessment Section (DNR-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 five primary focus areas: 1) status and trend monitoring; 2) reference (benchmark) biological criteria development; 3) random site survey sampling; 4) impaired stream assessment; and 5) nutrient criteria development.

*Status and Trend Monitoring*

Status and trend monitoring continues according to a four-year rotational schedule established for approximately 100 warm water ***wadeable stream reference sites***. In 2019, 25 sites were sampled and in 2020, 25 wadeable stream reference sites are scheduled to be sampled. 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 four-year rotational schedule established for 16 ***coldwater stream reference and candidate reference sites.*** The Iowa coldwater reference site network is sampled on a four year rotation with three or four sites sampled annually. In 2019, four CW reference sites were sampled and three sites are planned for 2020. A report on the ***coldwater stream benthic macroinvertebrate IBI (CBI)*** is available on the web at http://publications.iowa.gov/21843/.

*Biological Trend Sampling*

In 2016, the Iowa DNR chose nine reference sites (seven WW and two CW) to be sampled annually for fish, benthic macroinvertebrates and physical habitat. Also in 2016, equipment was installed at the nine biological trend sites to record continuous water and air temperature and

stream stage. These sites will be part of EPA Region VII's Regional Monitoring Network (RMN). The biological trend sampling was continued in 2019 and will continue at the same nine sites for the foreseeable future.

*Reference condition development*

The focus of ***reference condition development*** work continued/continues on candidate reference sites representing ***small (headwater) warm water perennial streams***. More intensive sampling was conducted from 2013-2017 on headwater streams than occurred in the past. The DNR WQMA is in the process of analyzing all the HW data and developing fish and macroinvertebrate IBIs for HW streams.

The DNR Bioassessment program is also 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 2012-2016. In 2017, a four-year rotational schedule of sampling 15 ambient monthly WQ sites annually (60 total sites) began. In 2019, 19 ambient WQ sites were sampled and sampling at 16 sites is planned for 2020.

*Random survey sampling*

Beginning in 2017, DNR-WQMA began a new random survey. The survey involves sampling 150 total sites in a five year period. The breakdown of sites includes sampling 15 repeat REMAP (originally sampled in 2002-2006) sites/year for 5 years (75 total sites) and also sampling 15 new random sites (REMAP2) sites/year for 5 years (75 total sites). In 2019, 16 repeat REMAP sites and 13 REMAP2 sites were sampled. In 2019, the goal is to sample 20 repeat REMAP sites and 22 REMAP2 sites to catch up.

*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 2019, no fish assemblage sampling was conducted in stream segments needing ***status updates*** following ***fishkill events*** that occurred several years ago resulting in Section 303(d) impairment listings for aquatic life uses. However, two sites were sampled biologically to determine improvement and possible removal from the Impaired Waters list. In 2020, those two sites will be sampled again and the plan is to sample 5-10 fishkill follow-up sites.

*Nutrient criteria development*

Sampling and analysis of benthic macroinvertebrate, fish and water quality data continues to be done to support the development and evaluation of ***nutrient criteria*** for the protection of ***stream aquatic communities***. The current work is focusing on collecting and analyzing data for nutrient stressor and response parameters including nitrogen, phosphorus, benthic and sestonic algal chlorophyll A, and diel dissolved oxygen flux. Biological, nutrient and other WQ data were collected at six sites in 2019. Those six sites (part of a South Fork Iowa River Study), along with a repeat Random site in the watershed, will be sampled in 2020.

*Stream habitat indicators*

Physical habitat characteristics such as stream width, depth, instream cover, and substrate composition are important environmental factors that shape Iowa's stream fish species assemblages. The DNR's stream biological assessment program collects physical habitat data to help interpret fish assemblage sampling results in order to assess stream health condition and the attainment status of designated aquatic life uses. In 2015, a study was completed from which quantitative habitat indicators and interpretative guidelines were developed for specific applications within the stream bioassessment program. These tools might also be useful to natural resource managers for purposes such as stream habitat improvement prioritization, goal-setting, and performance assessment. The final report is available at http://publications.iowa.gov/id/eprint/21408.

*Online Fish, Benthic Macroinvertebrate, Habitat and Water Quality Data*

***BioNet***, the Iowa bioassessment ***internet database*** **(**https://programs.iowadnr.gov/bionet/**)**, stores and provides public access to data from the Iowa DNR's stream bioassessment program. BioNet summarizes sampling data for benthic macroinvertebrates, fish, and stream habitat from 1994 to the present and also links to both water quality data collected at the sites and the assessments developed for the sites. BioNet is also the repository for stream fish sampling data collected by the Fisheries Bureau of the Iowa DNR. BioNet is continually updated and improved.

**Interior Rivers Research**

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*Response of Fish and Habitat to Stream Rehabilitation Practices in Iowa*

Stream habitat is a key factor influencing the health of stream fish populations. Iowa's river and stream fish resources have been greatly impacted by habitat degradation. Concerned with the continued degradation of river and stream habitats and fisheries, Iowa resource managers are interested in using stream rehabilitation practices to effectively improve these resources. This study began in 2010 to evaluate Iowa river and stream rehabilitation practices and develop management guidelines to improve river and stream habitat as well as fishing opportunities for Iowa anglers.

The first project being evaluated is the modification of the Vernon Springs Dam on the Turkey River at Cresco. 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 done at three sites above the dam and two sites below. 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 done at three sites on the Volga River to serve as control sites for the three upstream sites on the Turkey River. Post-construction sampling upstream of the project found 16 Black Redhorse, 11 Golden Redhorse, 3 Walleye, and 1 Northern Hog Sucker that moved upstream over the structure. Smallmouth Bass and Black Redhorse were sampled post-construction above the dam at sites on the Turkey River and N. Branch Turkey River where they were not found pre-construction.

Pre-project fish and habitat data were collected in 2012 and 2013 for a dam removal on the Shell Rock River in Rockford. The dam was removed in the winter of 2014 and four years of post-project sampling have been completed. Golden Redhorse and Northern Hog Sucker were collected for the first time at sites above the dam in 2014, and increasing numbers of these

species were found upstream in 2015, 2017, 2018, and 2019. Channel Catfish numbers also increased at sites above the former dam. The project has restored riverine habitat in the former impoundment and resulted in an improved fish community (increased number of species, adult Channel Catfish abundance, and Smallmouth Bass abundance). Dam removal negatively impacted downstream habitat initially, but habitat conditions largely recovered within 3-4 years post removal.

A whitewater park and habitat improvement project was completed in spring 2015 at the site of the Marion Street Dam on the Maquoketa River in Manchester. Pre-project fish and habitat sampling was done at sites upstream and downstream of the dam in 2012-2014. Over 14,000 fish of 19 species were marked downstream of the dam to monitor fish movement over the new structures. Sampling in 2015-2019 found 516 marked fish representing 12 species that had moved upstream over the structures. Continued monitoring of these projects and investigations of additional stream rehabilitation projects will help guide future decisions and lead to improved methods, designs, and sharing of resources to improve Iowa's river and stream fisheries.

*Evaluating Interior River Fingerling Walleye Stocking Strategies*

Walleye fingerling stocking has greatly increased Iowa's interior river walleye populations over the last 20 years. This has resulted in an increasingly popular fishery that has brought walleye fishing opportunities close to home for many Iowa anglers. The success of this program has also increased demand for two inch long, Mississippi River strain walleye fingerlings. Limited hatchery capacity has made it difficult to consistently produce enough fingerlings of the size and genetic strain requested for the program. Providing information needed to more efficiently utilize our limited hatchery production capacity and exploring the potential of alternative fish culture systems in meeting the demands of the river walleye program is the focus of this study.

Available pond culture space has been a limiting factor for producing Mississippi River strain fingerling walleye to stock in interior rivers. Recent research at the Rathbun Fish Culture Research Facility has shown promising results raising walleye fingerlings using an alternative method, intensive fry culture. Intensively reared walleye fry are stocked into recirculating tanks and trained on formulated feed from day 1 post-hatch, instead of stocking them into ponds where they feed on zooplankton (extensive culture). Evaluating the relative contribution of intensively reared fingerlings to interior river walleye

fisheries will determine whether this production method could help further improve river walleye fisheries.

Study sites were selected on four Iowa rivers to evaluate the relative contribution of intensively reared walleye fingerlings to interior river Walleye populations. Extensively reared fingerlings were marked, hauled, and stocked alongside intensively reared fingerlings to serve as a control. Walleye fingerlings produced by this culture method are known to survive and contribute to river walleye fisheries if river conditions are favorable. Intensively cultured walleye fingerlings were marked with a circle freeze brand and extensively cultured fish were marked with a bar brand. Between 44,000 and 57,500 marked intensively and extensively cultured walleye fingerlings were stocked annually in the Wapsipinicon, Maquoketa, and Cedar rivers during June 2015-2017, and in the Shell Rock River in June 2016. Study sites were sampled in late-September and October each year to determine survival and growth of walleye fingerlings. Preliminary results indicate that intensively reared fingerlings contribute to interior river walleye populations at a lower rate than extensively reared fingerlings. Intensively reared fingerlings have accounted for 20% or less of branded young-of-year fish sampled during fall at most sites during most years. River conditions were not conducive to survival of walleye fingerlings raised by either culture method in some rivers each year. We will continue to mark and stock walleye fingerlings raised by each culture method and monitor their survival and growth. The resulting information will guide production and stocking decisions for walleye fingerlings that will provide the greatest benefits for sustaining and improving walleye fisheries in Iowa rivers.

**West-Central Iowa Fisheries Management**

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The two low head dams on the Des Moines River in Fort Dodge have been removed. This was a permitted deconstruction effort. Removal of the dams is anticipated to uncover miles of bedrock that had been silted over since the dams were first built. The removal of these dams reconnects a large portion of the Des Moines River that was once separated by some significant barriers.

The Linn Grove Dam on the Little Sioux River was breached by flood waters in the spring of 2019. Flood waters cut around the south end of the dam through an earthen embankment and created a new channel. Under normal flows water no longer flows over the Linn Grove Dam, but rather through the new channel that has been cut. It is unclear what will happen with this area in the future. The dam is owned by Buena Vista County and they are currently working with the ACOE and FEMA to determine what can be done. The Linn Grove dam has been a popular destination fishery for walleye and northern pike on the Little Sioux River. To my knowledge it was the only remaining dam on the Little Sioux River above Sill #4, which is near the confluence of the Little Sioux and the Missouri River.


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