

Project Title:

Fish Community Survey in the White and Cache rivers, Arkansas

Project Summary: The goal of this project is to collect baseline fish community information that will help focus research on potential negative effects of Asian carp (bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*Hypophthalmichthys molitrix*)) on native fish species. Sampling will be conducted via electrofishing (relative abundance, species richness, catch-per-unit-effort) at several sample sites on the White River downstream of Mountain View to the confluence of the Mississippi River and the lower Cache River (Woodruff and Monroe counties). Vogt (2013) sampled the same section of the White River in 2010 to assess changes in fish community assemblage along the longitudinal gradient of the river. Since 2010 Asian carp have become abundant in the White and Cache rivers. This study will examine changes in the White River fish community between 2010 and 2016 to determine species that may be negatively impacted by Asian carp and establish baseline monitoring data for the White and Cache rivers.

Project Leader:

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Project Partners:

Micah Tindall, Fisheries Management Biologist, Arkansas Game and Fish Commission, 1201 Highway 49 North, Brinkley, AR 72021, micah.tindall@agfc.ar.gov, 870-734-4581

Jeff Quinn, Stream Management Biologist (Statewide), Arkansas Game and Fish Commission, 213 A Highway 89 S, Mayflower, AR, 72106, jeffrey.quinn@agfc.ar.gov, 877-470-3309

Project Budget:

| | |
|--------------------------------------|-----------|
| State Wildlife Grant Request: | \$26,500 |
| Matching Funds and In-Kind Services: | \$86,296 |
| Total Project Cost: | \$112,796 |

Project Statement:

a. Need -

In the Arkansas Wildlife Action Plan (Section 5, page 1589), the Mississippi Alluvial Plain-White River ecobasin (which includes the Cache River) contains 19 species of fish that are listed as species of greatest conservation need. Vogt (2013) collected three SGCN including Western Sand Darter (*Ammocrypta clara*), Paddlefish (*Polyodon spathula*), and Goldeye (*Hiodon alosoides*) from the White River. The Arkansas Wildlife Action Plan also calls the Mississippi Alluvial Plain- White River ecobasin one of the most productive and speciose in the state. However, the plan also notes that native fish fauna, especially large river fishes have declined due to thermal and flow modifications from upstream impoundments. The 2015 State Wildlife Grants Request for Proposals specifically calls for distribution and status surveys of aquatic biota in the middle White River. This study will provide data that can be compared to previous studies to examine trends in fish community structure in the White River and baseline data for the Cache River.

Asian carp may also be detrimental to native fish fauna due to their large numbers, size, and feeding habits. Because Asian carp are filter feeders that grow to a large size they have the potential to not only impact species like Paddlefish through direct competition but other SGCN by reallocating energy in the food web that would normally be available to native fish. This project will provide essential information that will be useful in determining which native species may be negatively impacted by Asian carp.

b. Purpose and Objectives –

The outcome of this project will be more current information on the White and Cache river fish community structures. This project will also include a comparison of current White River fish community structure to that sampled by Vogt (2013). Trends in abundance between the two studies will be useful to identify areas occupied by SGCN and SGCN that may be in decline or improving. The comparison between the two studies will also be useful in identifying species that may be negatively impacted by the recent infestation of Asian carp. Results from this comparison will provide managers with information they can use to focus their studies on SGCN or Asian carp impacts on the White and Cache rivers.

Project objectives:

- 1) During the summer of 2016 the White River will be sampled via electrofishing similar to Vogt (2013) to allow for comparison between the two studies.
- 2) During the summer of 2017 the Cache River will be sampled using similar methods to assess fish community structure and provide baseline information on SGCN.
- 3) All Asian carp collected will be documented to establish current distribution and presence/absence.
- 4) Relative abundance and catch-per-unit-effort (CPUE) for each species will be calculated at each sample site as well as species richness, diversity, and evenness.

c. Location –

The location of this project will be on the main stem of the White River downstream of Guion, Arkansas (rkm 530) to the confluence with the Mississippi River and the Cache River from Arkansas Highway 33 in Jackson County downstream to the confluence with the White River near Clarendon. These sample locations are in Stone, Izard, Independence, Jackson, White, Woodruff, Prairie, Monroe, Arkansas, Phillips, and Desha counties. Sampling will take place within the Mississippi Alluvial Plain- White River ecobasin along shoreline habitat within the selected sample sites on the main stem of each river.

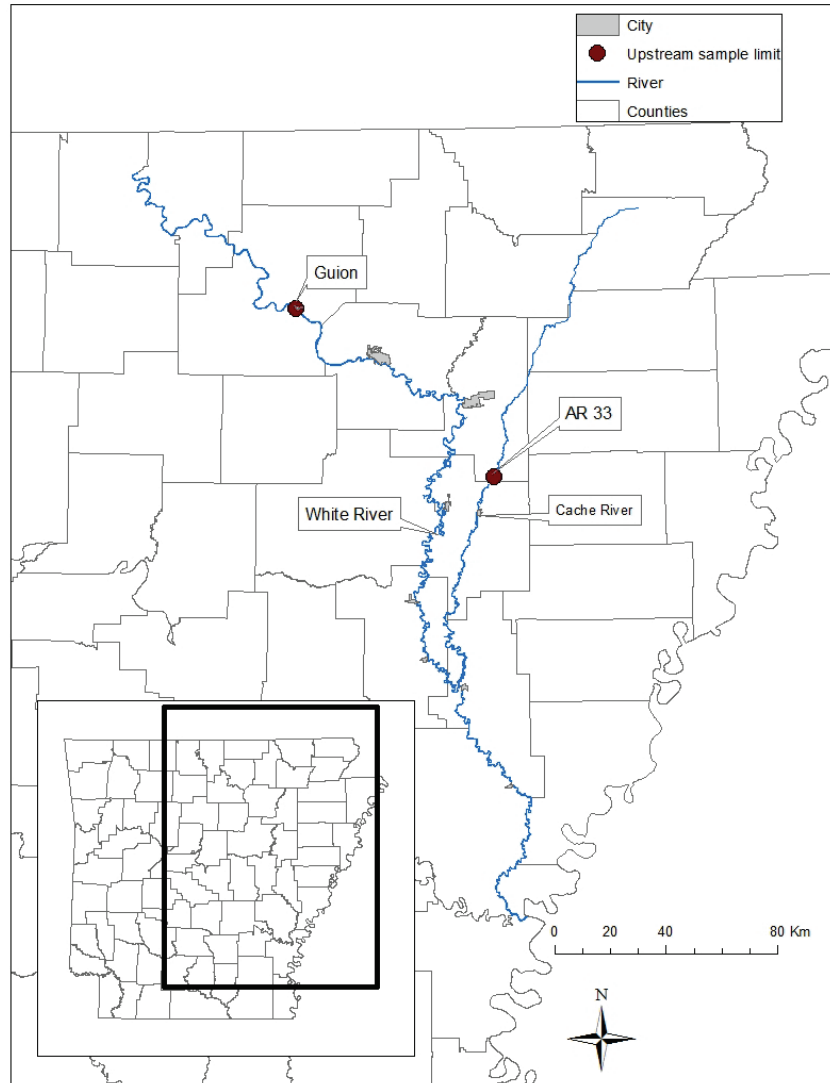


Figure 1. White and Cache rivers in eastern Arkansas.

d. Approach –

Sampling will be conducted similar to Vogt (2013) on the main stem of the White River during summer 2016. The sample portion of the river will be divided into 15-km subsections and six sites will be sampled within each subsection. Each site will be 10 minutes long and will alternate from left bank to right bank and between 60 and 15 Hz. All sampling will be done with a boat mounted electrofisher. On the Cache River, sampling will occur in a similar manner, however sampling at specified intervals may not be possible due to low summertime flow and may be limited to proximity to access areas. We plan to sample the White River during summer 2016 and the Cache River during summer 2017.

e. Expected Results and Benefits –

Results from this study will provide managers with information on fish community structure in the Mississippi Alluvial Plain- White River ecobasin that can be compared to information prior to the arrival of Asian carp. Managers will be able to search for trends in the data to determine if any SGCN or native species may be in decline and research the causes for decline (Asian carp or otherwise). The sampling on

the Cache River will also provide managers with a good baseline sample to compare to in the future. All of these efforts will help maintain the integrity of aquatic habitats in the Mississippi Alluvial Plain- White River ecobasin as listed in the 2015 State Wildlife Grants RFP Table 1.

f. Budget –

| Source Item | Study Years | | Grant |
|---|-----------------|-----------------|-----------------|
| | 2015 | 2016 | |
| Salary Expenses: | | | |
| One AGFC biologist @ \$42/man-hour for 500 hours/year | \$21,000 | \$21,000 | 0 |
| One AGFC biologist @ \$38/man-hour for 500 hours/year | \$19,000 | \$19,000 | 0 |
| Operating Expenses: | | | |
| AGFC vehicle (5000 miles @ \$0.42/mile) | \$2,148 | \$2,148 | 0 |
| AGFC boat gas | \$1,000 | \$1,000 | 0 |
| Capital Expenses | | | |
| <i>Electrofishing Equipment</i> | | | |
| Boat, Motor, Trailer, 140 HP Mercury Outboard | \$23,000 | 0 | \$23,500 |
| Electrical Rigging | \$3,500 | 0 | \$3,500 |
| Project Totals | \$69,648 | \$43,148 | \$26,500 |
| Total Project Cost | | | \$112,796 |
| Matching Funds and In-Kind Services | | | \$86,296 |
| State Wildlife Grant Request | | | \$26,500 |

Literature Cited

Vogt, N.E. 2013. Spatial transition of the fish community and environmental characteristics in the White River below Bull Shoals Dam. Master's Thesis. Arkansas Tech University.

Qualifications

Justin Homan – District Fisheries Supervisor, AGFC

7.5 years as assistant district biologist and district biologist in NC with NC Wildlife Resources Commission

1.5 years as district fisheries supervisor at AGFC

M.S. in Fisheries and Wildlife Biology from Arkansas Tech University

B.S. in Fisheries Science from Virginia Tech

Certified Fisheries Professional (AFS)

Micah Tindall – District Management Biologist, AGFC

1 year as district management biologist

2.5 years as hatchery biologist at Jim Hinkle Spring River State Fish Hatchery, AGFC

1 year part time experience with AGFC Fisheries Division

B.S. in Fisheries and Wildlife Biology from Arkansas Tech University

Jeff Quinn – Stream Management Biologist, AGFC

16 years as stream management biologist

M.S. in Zoology from University of Arkansas

B.S. in Biology from Winona State University

Certified Fisheries Professional (AFS)