

**Region 3 Endangered Species Project****STATE: Iowa**

E-14-R

**TITLE: Distribution and Abundance of Topeka Shiners in West-Central Iowa****Grant Dates:** October 1, 2007 to December 31, 2011**Project Dates:** January 1, 2009 to December 31, 2011**NEED**

The Topeka shiner (*Notropis topeka*) was listed as an endangered species under the Endangered Species Act in 1998. In 2002, the U.S. Fish and Wildlife Service proposed critical habitat, which included approximately 3,800 km of stream and river habitat in Iowa, Kansas, Minnesota, Nebraska, and South Dakota. As defined in a draft recovery plan (USFWS 2001), the Topeka shiner will be considered for down listing when "...all populations in the North Raccoon River portion of this unit must meet the described recovery criteria of 'stable or increasing over a period of 10 years'...". Although populations in the Raccoon River system are one of six different recovery units, a better understanding of their distribution and abundance is necessary for recovery of the species. Some research on Topeka shiners in Iowa was completed in the late 1990s and early 2000s by Iowa State University personnel, but little recent work has been conducted. The only exception is recent sampling by U.S. Fish and Wildlife (USFWS) personnel in Cedar Creek, a tributary to the North Raccoon River. The purpose of USFWS efforts has been to obtain population density estimates of Topeka shiners in Cedar Creek. The work of ISU and USFWS service personnel has greatly increased our knowledge on the distribution and abundance of Topeka shiners in Iowa; however, additional research is needed to ensure that recovery of the species in Iowa continues to move forward.

**OBJECTIVES**

- Describe the distribution and occurrence (i.e., presence-absence) of Topeka shiners in west-central Iowa;
- Estimate the density of Topeka shiners in west-central Iowa,
- Describe and define abiotic factors (i.e., physical and chemical habitat) and biotic interactions (i.e., predators, competitors) associated with the occurrence and abundance of Topeka shiners in Iowa waters.

**EXPECTED RESULTS/BENEFITS**

Fish will be intensively sampled from both in-channel and off-channel habitats. As such, intensive sampling of multiple habitats, with a specific focus on areas with a high probability of containing Topeka shiners, will help to better define the distribution of Topeka shiners in Iowa. This work will also provide information on the abundance of

Topeka shiners that can be used as baseline for monitoring efforts. Such data are critical for assessing the status of the species and meeting recovery benchmarks. Lastly, this work will provide additional information on the factors influencing the occurrence and abundance of Topeka shiners in Iowa. In particular, this work will identify physical habitat conditions (e.g., substrate composition, channel morphology) and biotic interactions (e.g., predator-prey dynamics, species associations) influencing the occurrence and density of Topeka shiners.

## **APPROACH**

### **Year 1**

Existing data will be used to develop logistic models that predict the presence-absence of Topeka shiners from large-scale habitat characteristics (e.g., stream order, channel gradient). These models will be used to identify potential sampling sites ( $N = 40$  reaches) in the Raccoon, Des Moines, and Boone River watersheds. Fish will be sampled from each reach using a combination of pulsed-DC electrofishing and seining. All sampled fish will be identified to species and a subsample of 50 fish will be measured to the nearest millimeter. If Topeka shiners are sampled, density estimates will be obtained using standard methods (e.g., multiple-pass depletion estimates). Physical habitat will be measured from each reach using standard methods.

Population sampling methods will follow or be similar to those used by the Rock Island Field Office staff in 2007. Final design of the project may change after additional analysis of sample locations is made by a graduate student. The final sampling design will be coordinated with the Rock Island Field Office.

Sampling will occur in private and public waters. Landowners will be contacted and permission obtained prior to sampling on private property.

Collection permits will be obtained prior to initiation of the field work. The permits may be under the principal investigator or the Iowa Department of Natural Resources.

### **Year 2**

The surveys and population estimation procedures will proceed in the same manner as in year 1.

### **Year 3**

Data will be processed, analyzed, and synthesized for use in management.

## **ROLES AND RESPONSIBILITIES**

Daryl Howell, Endangered Species Coordinator, will act as the Project Supervisor for the IDNR and will be responsible for project reporting and budget management.

Daryl Howell (515) 281-8524 or [Daryl.Howell@dnr.state.ia.us](mailto:Daryl.Howell@dnr.state.ia.us)

Drs. Michael Quist and Clay Pierce, Iowa State University, will act as the Co-Principal Investigators and will supervise field surveys, prepare progress reports, and the final report.

Dr. Michael Quist – (515) 294-9682 [mcquist@iastate.edu](mailto:mcquist@iastate.edu)

Dr. Clay Pierce – (515) 294-3159 [cpierce@iastate.edu](mailto:cpierce@iastate.edu)

**LOCATION**

The proposed work will be conducted in the Boone, Raccoon, and Des Moines River watersheds (Boone, Buena Vista, Calhoun, Carroll, Dallas, Emmet, Greene, Hamilton, Humboldt, Palo Alto, Pocahontas, Sac, Webster and Wright Counties in Iowa).

**ESTIMATED COSTS**

**Year 1**

Graduate student		
Stipend		\$20,412
Benefits (11.5%)		\$2,347
Tuition		\$2,028
Field technician		
Wages (\$9.50/hr × 40 hr/wk × 16 wks) ✓		\$6,080
Benefits (12%)		\$730
Travel		
Vehicle (\$464 month × 4 mo) ✓		\$1,856
Mileage (\$0.52/mi × 2,000 mi/mo × 4 mo) ✓		\$4,160
Lodging and meals (\$350/wk × 16 wk) ✓		\$5,600
Field Supplies		\$2,000
Computer Fees and Equipment Maintenance		\$800
<b>Total Cost</b>		<b>\$46,013</b> ✓
	<b>Federal Share (75%)</b> ✓	<b>\$34,510</b>
	<b>State Share (25%)</b>	<b>\$11,503</b>

**Funding for Year 1 will be from recovered traditional Section 6 funds for FY 07 and new traditional Section 6 funds from FY08.**

Recovered funds – FY07	\$10,518
Section 6 – FY08	\$23,992

Year 2 (3% increase)

Graduate student		
Stipend		\$21,024
Benefits (11.5%)		\$2,418
Tuition		\$2,140
Field technician		
Wages		\$6,263
Benefits (12%)		\$751
Travel		
Vehicle		\$1,912
Mileage		\$4,286
Lodging and meals (\$350/wk × 16 wk)	<i>5100 + 3%</i>	\$5,768
Meetings		\$2,500
Field Supplies		\$2,060
Computer Fees and Equipment Maintenance		\$824
<b>Total Cost</b>		<b>\$49,946</b> ✓
	<b>Federal Share</b> <i>15%</i>	<b>\$37,460</b>
	<b>State Share</b>	<b>\$12,486</b>

**Funding for Year 2 will be from traditional Section 6 for FY09**

**Year 3 (3% increase)**

Graduate student Stipend		\$16,241
Benefits (11.5%)		\$1,867
Tuition		\$1,129
Travel (Meetings)		\$2,500
<b>Total Cost</b>		<b>\$21,737</b> ✓
	<b>Federal Share</b> <i>15%</i>	<b>\$16,303</b>
	<b>State Share</b>	<b>\$ 5,434</b>

**Funding for year 3 will be from traditional Section 6 for FY10**

**REFERENCES**

USFWS. 2001. Topeka shiner recovery plan (draft). U.S. Fish and Wildlife Service, Manhattan, Kansas.