



U. S. Fish and Wildlife Service

Shiawassee NWR Fishery Management Plan Inventory and Analysis

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<http://midwest.fws.gov/alpena/index.htm>

The Alpena Fishery Resources Office worked with Shiawassee National Wildlife Refuge (NWR) staff and Friends of Shiawassee NWR to establish fishery surveys for fishery management plan development on Shiawassee NWR. In 2001, surveys were conducted to assess species composition and establish a baseline for relative abundance in perennial fish habitat on Shiawassee NWR. Northern pike were once plentiful in the Saginaw River, but have declined due to diking of wetlands used for spawning and nursery habitat. These habitats exist on Shiawassee NWR; however, fish access for northern pike and many other species is limited during critical spawning and nursery periods by refuge management practices. Information gathered by this project will aid refuge personnel in evaluation of timing of management practices in order to increase fish access to wetland habitat during critical periods. An additional survey was completed on the property for the proposed Discovery Center in July 2001.



Figure 1. Triangle Pool, an open water deep pool at Shiawassee NWR.

Study Area and Methods

Three main types of habitat were surveyed at Shiawassee NWR in 2001. Pools 1A, 2, North Marsh/Eagle Marsh and Triangle are open water pools with depths up to 8 feet, some non-vegetated substrate and are not routinely dewatered (Figure 1, 2). Trinklein, Ferguson Slough, and Pool 1B, are shallower (maximum depth 4 feet), with entirely vegetated substrate and may periodically be drained completely (Figure 2, 7). The Flint River site is adjacent to refuge property in the main channel by Pool 4. The sites on the proposed Discovery Center property included two habitat types. The Cass Park and Pondweed Pool sites were shallow, vegetated floodwater areas (Figure 3). The Cass River site was in the main channel adjacent to refuge property (Figure 3).

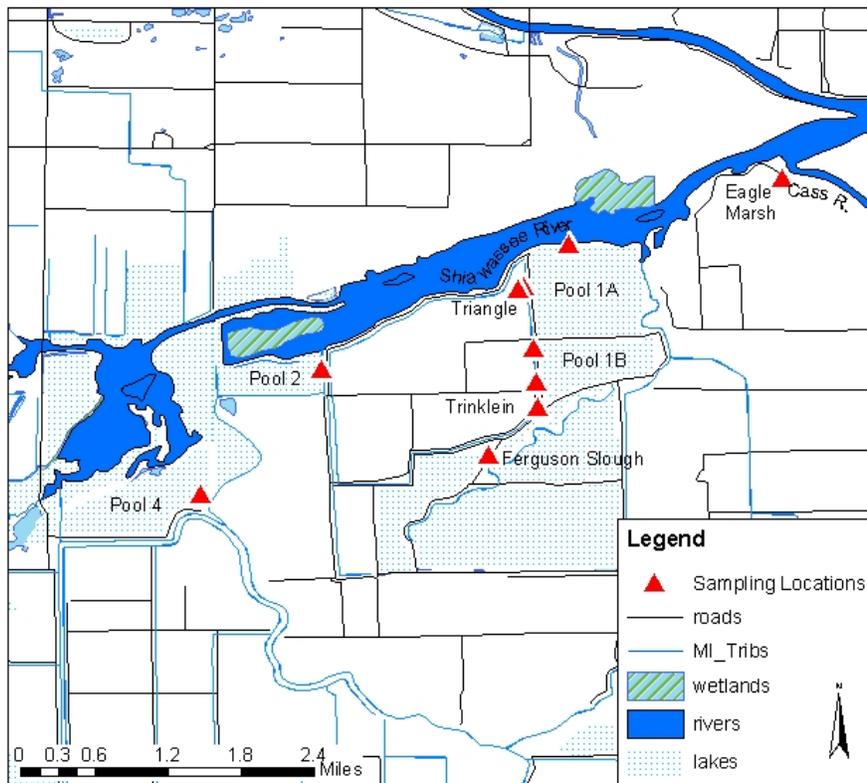
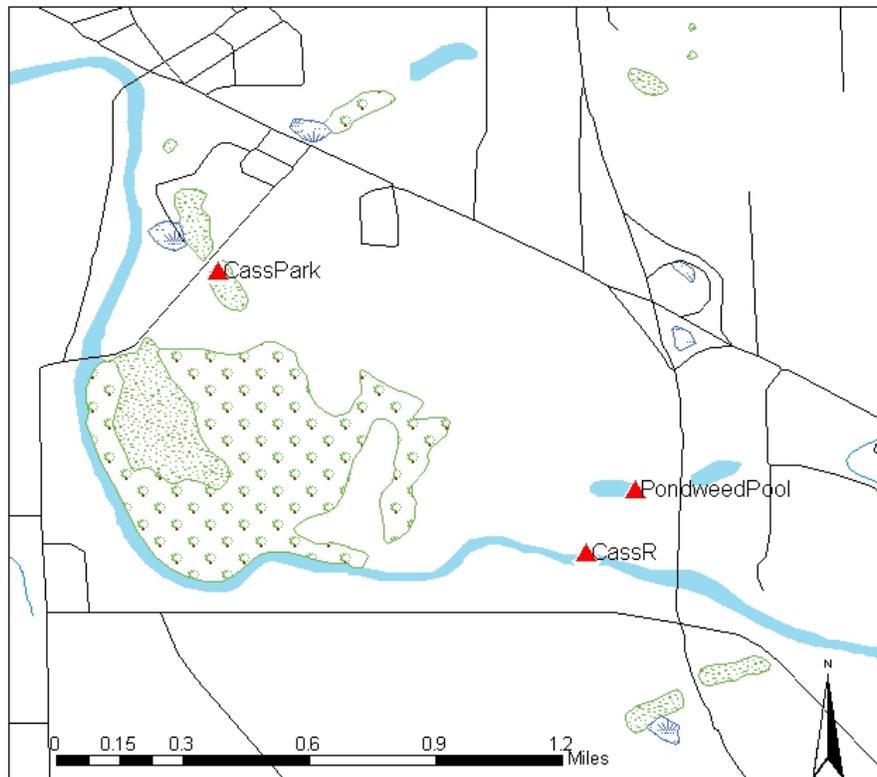


Figure 2. Sampling locations at Shiawassee NWR, 2001.

Shiawassee sites were surveyed twice in March, and once in May and June. In July proposed Discovery Center sites were surveyed. Shiawassee sites were surveyed with 4' x 6' trap nets, 3' hoop nets, 2.5' x 2.5' trap nets, and a 100' beach seine. Discovery Center sites were sampled with minnow traps and backpack electroshocking. Effort expended was one overnight set, one seine haul, or shocking until site was exhausted.



Legend



Figure 3. Sampling locations at proposed Discovery Center, 2001.

Results and Discussion

The natural and breached marsh areas of Shiawassee NWR have high species diversity and abundance of shiners, crappie, sunfish and largemouth bass. Also present are bowfin, rock bass, yellow perch, and northern pike. The closed pools and other areas where the water level is regulated have lower species diversity except for Pool 1A which has overwintering habitat which allows more species to subsist. Pool 1A has a high relative abundance of goldfish and carp, shiners, bullheads, warmouth, mudminnows, and juvenile northern pike (Figure 4, 5). Black bullheads were found at all regulated sites, goldfish and carp were found in all but Ferguson Slough (which only received one trap night of effort). Bluegill were only found in Pool 2, which will probably summerkill due to low water conditions. Emerald shiners, golden redhorse, northern pike, white crappie, and white suckers were only found in Pool 1A.

One juvenile and one spawning adult northern pike were captured at North Marsh. Ten juvenile and one spawning adult northern pike were captured at Pool 1A. Twenty-seven fish species were documented on the Shiawassee NWR in 2001. Species of interest to anglers include yellow perch, white crappie, black crappie, smallmouth bass, largemouth bass, bluegill, pumpkinseed, and green sunfish.

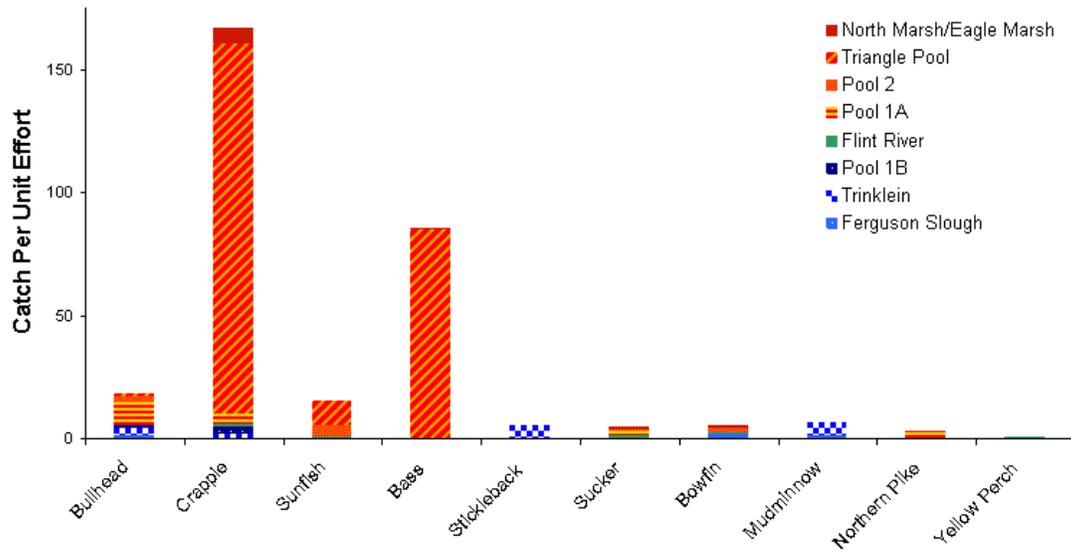


Figure 4. Number of fish caught at Shiawassee in 2001, by species excluding minnows.

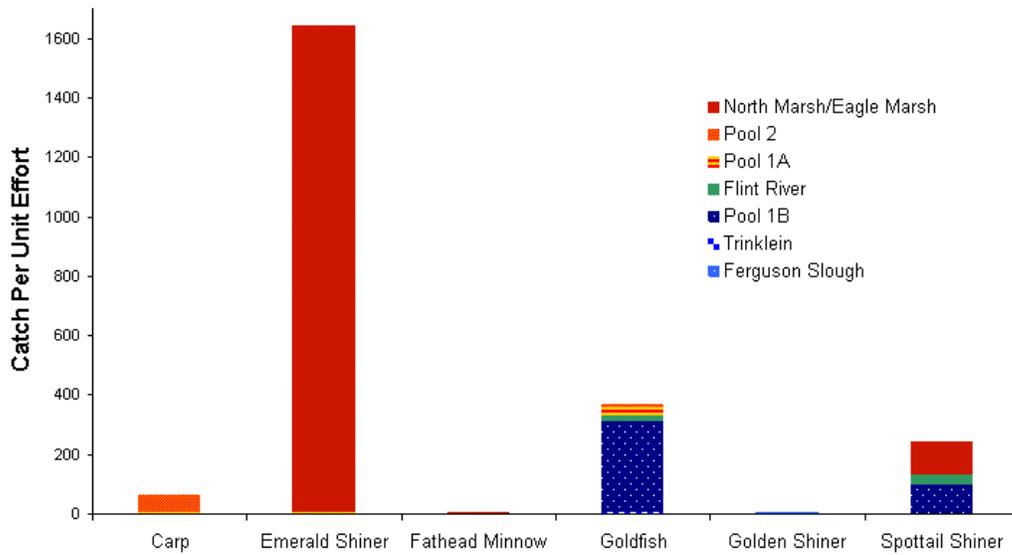


Figure 5. Minnow species caught at Shiawassee NWR 2001.

No fish were captured in the Pondweed Pool. The Cass Park site, which is more actively connected to the Cass River than the Pondweed Pool, and the Cass River site contained a community of centrachids and minnows (Figure 6).

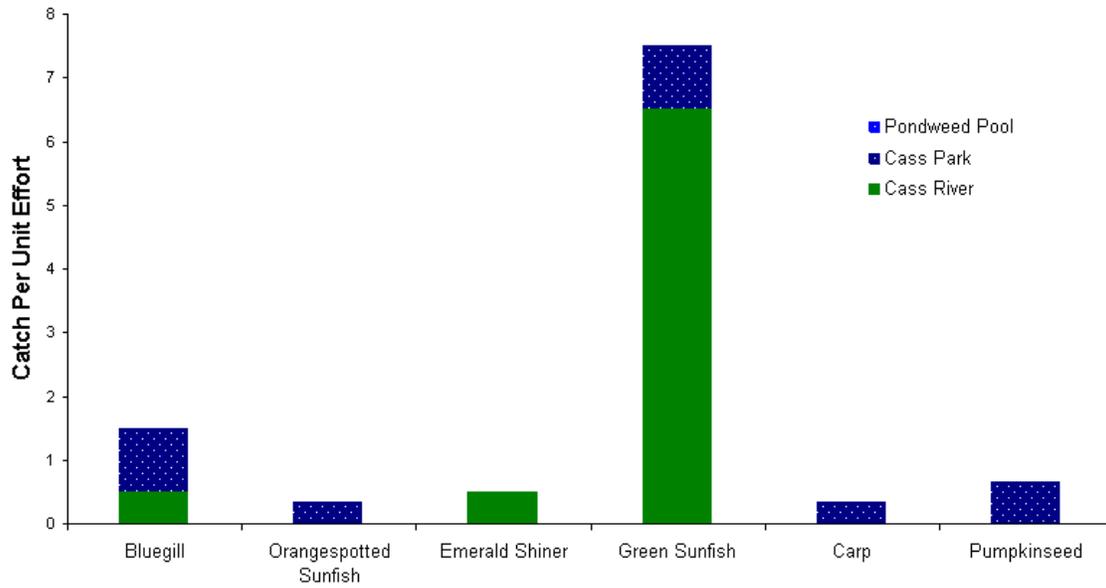


Figure 6. Fish community composition at proposed Discovery Center site, July 2001.

Low water levels impaired sampling in 2001. The natural open wetland on Shiawassee NWR was too low to sample on all but one occasion in 2001. Fish habitat at the Discovery Center sites is limited to seasonally flooded wetlands and side channels of the Cass River. The seasonally flooded wetlands are uncontrolled and will be available as spawning habitat for pike and other species in the Cass River drainage. Controlled wetlands on Shiawassee NWR can be made available as northern pike spawning and rearing habitat. Access will need to be opened in late February to allow spawning fish to enter. Access will need to remain open or be periodically opened through March to allow adults to leave after spawning. Young northern pike could be allowed to escape as convenient throughout the rest of the summer.



Figure 7. Ferguson Slough, a vegetated slough at Shiawassee NWR.

Table 1. Species catch information for Shiawassee NWR surveys, 2001.

Species	Average Length (mm)	Range (mm)	Total Number Caught	Shiawassee Site	Proposed Discovery Center Site
Black Bullhead	120	60-233	61	Ferguson Slough, Pool 1B, Pool 1A, Pool 2, Trinklein	
Black Crappie	166	80-265	30	Flint River, North/Eagle Marsh, Pool 1B, Pool 1A	
Bluegill	107	48-149	27	Triangle Pool, Pool 2, North/Eagle Marsh	Cass River, Cass Tributary
Bowfin	450	154-671	9	Ferguson Slough, Flint River, North/Eagle Marsh, Pool 2, Triangle Pool	
Brook Stickleback	34	27-39	10	Trinklein	
Carp	246	10-680	138	North/Eagle Marsh, Pool 1B, Pool 1A, Pool 2	Cass Tributary
Emerald Shiner	73	42-118	4923	Flint River, North/Eagle Marsh, Pool 1A	Cass River
Fathead Minnow	44	26-59	15	North/Eagle Marsh	
Goldfish	93	18-507	850	Flint River, North/Eagle Marsh, Pool 1B, Pool 1A, Pool 2, Trinklein	
Golden Redhorse	242	230-260	3	North/Eagle Marsh, Pool 1A	
Golden Shiner	66	38-88	11	Ferguson Slough, North/Eagle Marsh	
Green Sunfish	69	50-135	16		Cass Tributary, Cass River
Largemouth Bass	29	22-34	170	Triangle Pool	
Longnose Sucker	128		1	Pool 2	
Mudminnow	106	89-135	12	Ferguson Slough, Trinklein	
Northern Pike	238	57-618	13	North/Eagle Marsh, Pool 1A	
Orangespotted Sunfish	66		1		Cass Tributary
Pumpkinseed	84	75-104	11	Flint River, Pool 1A, Pool 2	Cass Tributary
Quillback	147	70-222	6	Flint River, Pool 1A	
Rock Bass	141		1	Flint River	
Smallmouth Bass	43		1	North/Eagle Marsh	
Spottail Shiner	80	19-122	634	Flint River, North/Eagle Marsh, Pool 1B, Pool 1A, Trinklein	
Warmouth	82	61-86	14	Pool 1B, Pool 1A, Trinklein	
White Crappie	59	22-258	308	Flint River, North/Eagle Marsh, Pool 1A, Triangle Pool	
White Sucker	155	100-256	6	Flint River, North/Eagle Marsh, Pool 1A	
Yellow Bullhead	190	131-289	4	Pool 2, Triangle Pool	
Yellow Perch	180		1	Flint River	

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