PUGNOSE SHINER RESTORATION EFFORTS IN A LAKE ONTARIO BAY IN NEW YORK

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The Pugnose Shiner (*Notropis anogenus*) is a small (~50 mm) silvery minnow, distinguished by a tiny, sharply upturned mouth (Figure 1). This species inhabits lake margins or slow-moving rivers with low turbidity and dense submergent vegetation in the Great Lakes and upper Mississippi River basins (COSEWIC 2013). In New York State and Canada, the Pugnose Shiner is listed as Endangered and is listed as Threatened globally by the American Fisheries Society (Jelks et al. 2008). In New York State, this species is rare in the St. Lawrence River and extirpated from Cayuga Lake and all but one Lake Ontario embayment. Further, this minnow is rare across all of central and northeastern North America. New York populations are at the eastern edge of the species' range.

The last known Pugnose Shiner population in Lake Ontario occurs in Sodus Bay, a southern embayment. This population is genetically unique from populations found in the St. Lawrence River (McCusker et al. 2014). Efforts to establish Pugnose Shiners in Chaumont Bay, a northeastern Lake Ontario embayment, began in 2014 with a New York State Department of Environmental Conservation collaboration with the Fisheries and Aquaculture Program at the State University of New York (SUNY) at Cobleskill. The goal of this introduction was to preserve genetic diversity within Pugnose Shiner populations in New York by establishing them in a second area. In just four years of effort, the first major signs of success were documented in the fall of 2018. Juvenile and adult Pugnose Shiners were captured indicating survival of stocked fish as well as natural reproduction.

Restoration efforts began with collection of Pugnose Shiners from Sodus Bay to serve as broodstock. Pugnose Shiners were reared in a 0.2 ha pond (3 m maximum depth) at SUNY Cobleskill. Approximately 6,600 pond-reared shiners were stocked

Doug Carlson has had a long career with conservation of rare and common fishes within the New York Department of Environmental Conservation. He looks forward to retiring soon and traveling to the NANFA convention in Mississippi, where he will be humbled by the southern fishes being way more colorful and challenging.

Dr. John Foster was raised on the shores of the tidal Potomac, where he wasted his youth chasing porgies and blues. He earned a bachelor's degree from the Univ. of Maryland, then moved on to the Great Lakes earning a masters and doctorate from the Univ. of Toronto. Following nearly ten years on the Bay of Fundy at the Huntsman Marine Laboratory, Dr. Foster spent the next 30 years at the State Univ. of NY at Cobleskill serving as into Chaumont Bay in 2016–17 (Figure 2). Two stockings occurred in fall 2016 at Long Point State Park, and another occurred in April 2017 at two nearby areas about 5 km to the north (Three Mile Bay) and west (the Isthmus) (Figure 3). An underwater video clip of the stocking can be seen at https://www.facebook.com/NYSDEC/ videos/10154743714620956/.

Post-stocking evaluations occurred in October 2018, 17 to 24 months after stocking. Ten Pugnose Shiners were collected within 1 km of each of the three stocking locations. In two bays Pugnose Shiners were also captured 0.3 km away from the stocking location. Fish were captured in areas with dense submergent vegetation in about 1.6 m of water. Fish ranged in size from a 30 mm (young of year) fish to a very large 67 mm adult. Ages, interpreted



Figure 1. Adult Pugnose Shiner. (Photo by Konrad Schmidt)

Professor of Fisheries & Aquaculture and Chair of the Fisheries, Wildlife & Environmental Science Department. After retiring from the faculty in 2018, Dr. Foster currently heads a project developing freshwater and marine resources in Haiti with the State Univ. of NY's Research Foundation.

Brent Lehman grew up in a rural upstate NY, where he enjoyed what the outdoors had to offer. This is where he found his passion for fish. Living near the Salmon River and watching the seasonal salmon run "sealed the deal" for Brett, who knew his career had to be in fisheries. He now supervises the fish hatchery at the State University of New York at Cobleskill and teaches hatchery management. He is completing his Master's Degree with a study of Pugnose Shiner culture and marking techniques.



Figure 2. Stocking Pugnose Shiners in Chaumont Bay, Long Point State Park. (Photo by Doug Carlson)

from scale impressions, indicated the presence of three year classes in Chaumont Bay. Most shiners captured were yearlings, which would have likely reached sexual maturity earlier that summer (Porterfield and Ceas 2012).

Survival of stocked fish and evidence of wild production of this rare species occurred sooner than anticipated in this large bay complex in Lake Ontario. With continued reproductive success, a naturally reproducing population of Pugnose Shiners is expected to become established in Chaumont Bay. With the current population of three year classes, the Pugnose Shiner stocking program has ended in Chaumont Bay

Experience gained by this project may be applicable for restoration of other extirpated Pugnose Shiner populations in New York, Minnesota, Wisconsin, and Canada.

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Figure 3. New York waters with Pugnose Shiners and stocking locations.

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