# Species Action Plan:
## Longnose Sucker
## (*Catostomus catostomus*)

Purpose: This plan provides an initial five-year blueprint for the actions needed to attain near-term and, ultimately, long-term goals for the conservation and recovery of the state endangered Longnose Sucker. The action plan is a living document and will be updated as needed to reflect progress toward those goals and to incorporate new information as it becomes available.

Goals: The goal of this plan is to provide guidance for the maintenance, augmentation, and protection of extant populations of Longnose Sucker in the Commonwealth and to protect its habitat. The secondary goal is to describe the autecology of the Longnose Sucker and develop appropriate reintroduction and monitoring strategies. Ultimately it is hoped the species will recover to the point where it can be removed from the Pennsylvania list of endangered species (58 Pa. Code §75.1).

## Natural History

Taxonomy: Class - Actinopterygii, Order - Perciformes, Family - Catostomidae, Genus species – *Catostomus catostomus*, Common Name – Longnose Sucker. A population in the Monongahela River drainage is isolated from the remainder of the population, which is distributed to the north (Stauffer et al. 2016). This disjunct population may be taxonomically distinct.

Description: The longnose sucker has a cylindrical body with a distinctive horizontal mouth and a long, rounded snout. Its color varies from olive to gray above and white or cream below; breeding males are darker, and females may be green to gold above. Both sexes have red lateral stripes (Pennsylvania Natural Heritage Program, 2023)

Figure 1. Longnose Sucker (*Catostomus catostomus*), Photo Credit: Doug Fischer

Life History and Habitat: Longnose Suckers inhabit clear, cool streams, rivers, and lakes, including shallow waters of the Great Lakes (Becker 1983, Cooper 1983, Green et al. 1966, Smith 1985). The Monongahela River population occurs in small to medium cool, clear streams. Longnose Suckers there occur most frequently in deeper pools and slower runs, usually below riffles or torrents where boulder-rubble substrate or submerged coarse woody debris exists. Bedrock and patches of gravel and cobble may also be present (Stauffer et al. 2016, PFBC observations). It is noteworthy that Jordan (1878) reported this species from the Youghiogheny River near McKeesport, Allegheny County, a location where the river is substantially larger than any currently occupied waterway. Young-of-year have been collected in lower, more

sluggish sections of occupied streams (PFBC unpublished data).
No specific life history information is available for the Monongahela River population of the Longnose Sucker. Bailey (1969), Geen et al. (1966), Harris (1962), and Rawson & Elsey (1950) reported on aspects of Longnose Sucker spawning behavior. Primary spawning occurs at water temperatures of 10-15° C. Significant spawning runs have been reported from lakes into tributary rivers. Lake shoals and riffles with gravel substrate are important spawning areas. Fecundity varies from 14,000-35,000 eggs (Bailey 1969). Most larvae migrate downstream at night in high, turbid waters (Geen et al. 1966). Both sexes grow at approximately the same rate (Harris 1962). Bailey (1969) reported that males from western Lake Superior were mature by age-8, and females by age-9. The largest known Longnose Sucker is a 642 mm FL (25.3 in.) 3.31 kg. (7.3 lb.) female from Great Slave Lake that was 19 years old (Harris, 1962). The Longnose Sucker cannot tolerate warm waters, and its upper lethal temperature limit is 26.5° C (Black 1953). We have not examined a Monongahela River drainage specimen that exceeds 250 mm. It is not known if this small maximum size is a result of environmental circumstances, genetics, or a combination of factors.

Longnose Suckers feed on a wide variety of animals, as well as plant material. Crustaceans, insect larvae, fingernail clams, snails, cladocerans, and plants are important foods (Barton and Bidgood 1980, Becker 1983).

Research is needed to define basic aspects of life history and ecology of the Longnose Sucker in the Monongahela River drainage, such as age structure, growth, diet, habitat use, population density, population genetics, and the health of this disjunct population. The influence of anthropogenic perturbations on populations needs to be characterized. Interaction between the Longnose Sucker and introduced species has yet to be characterized and would be a useful component of a life history and status assessment.

## Distribution and Status

Global and National Distribution: The Longnose Sucker occurs from western Labrador south through New York and west to Washington and Alaska, as well as in the Monongahela River drainage; there is also a population in the Arctic Ocean drainages in Siberia (Gilbert and Lee 1980a, Page and Burr 2011). It has been reported from Ohio (Trautman 1981), Ontario (Scott and Crossman 1973), and from a single, old collection in New York (Smith 1985). It is presumed to have occurred in the intervening Lake Erie waters in Pennsylvania, but we are aware of no verified records (Cooper 1983, our data). The most recent records we are aware of for Lake Erie are from the late 1970s. In addition to Pennsylvania, the Monongahela River population occurred in Maryland and

West Virginia, but is apparently extirpated in those states (Stauffer et al. 1995).

Pennsylvania Distribution: In addition to Jordan's 1878 record, the Longnose Sucker has been collected in five tributaries to the Casselman River in southwestern Pennsylvania, all in Somerset County, and once from the mainstem Casselman (Criswell and Fischer 2002, PFBC unpublished data).

Pennsylvania Legal Status: Endangered (58 Pa. Code §75.1).

State Rank: S1 – Critically Imperiled (assessed 2014)

Global Status: G4G5 – Apparently Secure / Secure (assessed 2009)

The Pistolgrip will be considered for delisting when 80% of the historically occupied streams contain three distinct naturally reproduced year classes (PABS Bivalve Committee listing criteria) and a minimum number of individuals in each stream. A minimum number will be determined after analysis of occupied streams. Historical populations can include yet-undiscovered populations. Populations that contain at least three distinct year classes and a minimum number of individuals will be considered viable. A viable population is defined as a naturally reproducing population large enough to maintain sufficient genetic variation to enable it to evolve and respond to natural environmental changes (Soule 1980).

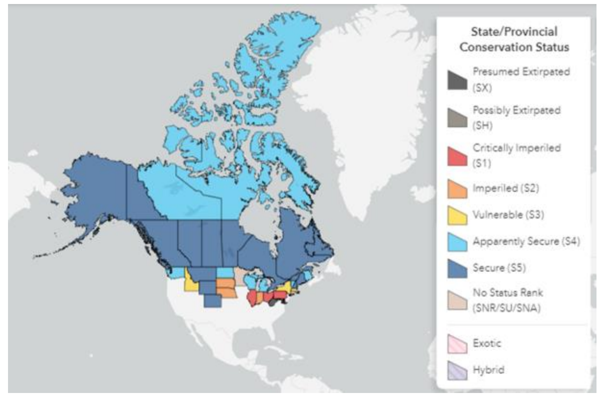


Figure 2. Distribution of *Catostomus catostomus* in North America (NatureServe 2023)

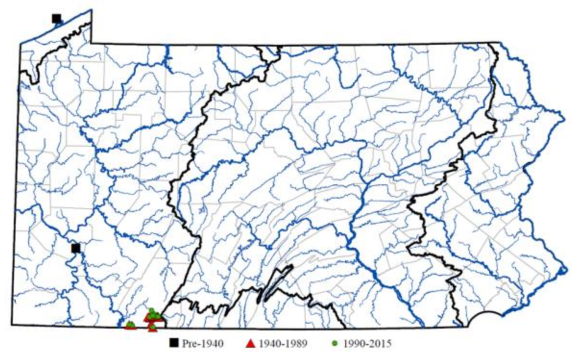


Figure 3. Distribution of *Catostomus Catostomus* in Pennsylvania (Stauffer et al 2016.).

## Management Status

The Longnose Sucker is secure at a global and national level. Regarding the Monongahela River population, the 1878 record from the Youghiogheny River in Allegheny County, approximately 80 km (50 mi) by air from the nearest occupied Somerset County site, along with the scattered records in Maryland and West Virginia, belies a much greater historical distribution. The long-term contraction of this range, along with very recent apparent declines, demonstrates the imperiled status of this population.

Population trends:
This plan discusses the Monongahela River population only. The Longnose Sucker was reported from the Tygart Valley River in West Virginia 1899 (Goldsborough and Clark 1908). In Maryland, it was reported Herrington Creek (1899) and Lake Koshare (1956 & 1957), an impoundment on that creek, in Garrett County (Goldsborough and Clark 1908, Elser 1957, Mansueti 1957). It was also collected in Buffalo Run (1977), Mill Run (1977 and 1978), and the Casselman River (1978) (Hendricks 1980). There have been no recent collections from any of these waterways.

In Pennsylvania, modern collections have been made in Blue Lick Creek Elklick Creek, Flaugherty Creek, Piney Creek, and Whites Creek (Criswell and Fischer 2002). Blue Lick Creek has produced only a single record, in 1993. Efforts to collect Longnose Suckers in Elklick Creek in 2019 failed. They may be collected rather consistently in short sections of Flaugherty Creek, and Piney Creek, and were present in 2019, although in very low numbers in the latter. They may have declined in Whites Creek, where they could be consistently taken up until recently. Surveys of two stations in 2019 failed to yield a single individual. Clearly, there has been a long-term decline in this population.

The Longnose Sucker is currently on Pennsylvania's list of threatened and endangered fishes; therefore, it receives the protection afforded by Chapter 75 of the Title 58 PA Code and it is reviewed in the Environmental Review permitting program administered by the Pennsylvania Natural Heritage Program.

## Threats

1) Water Quality Issues and Habitat Loss:
Casselman River: Hendricks (1980) listed major pollutants in the Youghiogheny watershed as acid mine drainage (AMD), municipal sewage, industrial effluents, agricultural run-off and siltation resulting from forest practices, mining, and construction, with AMD being the "most severe and limiting pollutant."

Smith & Lorson (1999) stated that the Casselman River, the receiving waterway for the four streams currently occupied by Longnose Suckers, has been severely degraded by AMD since the early 1900s. They reported that conditions were slowly recovering until an increase in AMD from the Coal Run/Shaw Mines complex in 1993 killed all aquatic life in the river from Boynton to the Youghiogheny River. Based on 1998 survey work, they concluded that fish communities had recovered dramatically from the 1993 kill and reported the collection of a single Longnose Sucker. A combination of remining, treatment of illegal AMD discharges, and minor remediation projects is apparently responsible for the recent improvements. The survey also provided evidence of continued AMD pollution in the Casselman.

Daley (1999), based on the results of his benthic macroinvertebrate assessment on the Casselman, also concluded that AMD discharges still have a significant deleterious effect on the river's aquatic communities.

In 2000, PSU personnel collected a small number of juvenile Longnose Suckers near the mouth of Elklick Creek and at the mouth of Flaugherty Creek (D. Fischer, unpub. data). No other juveniles have ever been reported from the Monongahela drainage. A short distance upstream of the mouth of these creeks, the Casselman River is heavily loaded with AMD discharging from the Coal Run/Shaw Mines complex (Daley, 1999; Smith & Lorson, 1999). Acid mine drainage may have decimated year classes and degraded benthic conditions extant in the river, severely affecting recruitment. Acid mine drainage threats are compounded by the small number of streams occupied by Longnose Suckers, limited reaches inhabited, and the fact that three of the four occupied streams are situated in the most polluted area of the basin.

<u>Occupied Tributaries:</u> Various threats are also evident in streams still occupied by Longnose Suckers. Weirich & Boyer (1987a) noted low spring pH values in Elklick Creek and tributary streams, which they attributed to both natural acidic runoff and AMD. Arway (1985) determined that Cranberry Run, a major tributary, is affected by previous mining in the headwater areas.

Shaffer (1955) reported a pH value of 2.6 from an unnamed tributary to Flaugherty Creek. In Flaugherty Creek, Boyer et al. (1979a) noted heavy bank erosion, lack of shade, and silt/rubble substrate. Similar conditions existed in 1987 (Weirich & Boyer, 1987b). Three of four sites exhibited low gradient, heavy siltation and bank erosion, and an absence of shade. The fourth site, occupied by Longnose Suckers, was characterized by a much higher gradient, little silt deposition, and boulder/rubble substrate. Boyer et al. (1979a) also reported a nearly total fish kill in 1976 caused by a diesel fuel spill from a derailed train.

Piney Creek, where Longnose Sucker densities appear to be the lowest, was characterized as primarily forested, but one survey station lacked in-stream cover and consisted of wide, shallow riffles (Boyer et al., 1979b). A second station included a few deep holes, but was also dominated by shallow riffles. Weirich & Boyer (1988a) expressed some concern over unreliable flow rates from Frostburg Reservoir on Piney Creek in Maryland.

Weirich & Boyer (1988b) reported some pasture and row crop use, residential development, and a small amount of mining on Whites Creek. They also expressed concern about possible siltation and stream warming that could result from future timbering operations.

Water temperature is a significant concern and is likely a limiting factor governing Longnose Sucker distribution. The highest water temperature recorded at any station where Longnose Suckers were collected in the Youghiogheny River drainage is 21.7° C. in Elklick Creek (Hendricks, 1980; PFBC reports). Specimens were collected in the occupied section of Flaugherty Creek on 24 June 1987, at 19.5° C., but not at three upstream stations at 20°, 21.5°, and 22.2° C. A 23 July 1987 temperature of 24.5° C. almost certainly precludes permanent Longnose Sucker occupation of a substantial portion of Whites Creek.

Weirich & Boyer (1987a & b) noted that the probable limiting factor in the Elklick Creek and Flaugherty Creek trout fisheries is water temperature and reported that shade is absent from much of the latter stream.

Significant additional forest overstory removal, or stream flow reductions, if permitted, could cause a decline in thermal conditions that may render additional stream sections uninhabitable by Longnose Suckers. Hendricks (1980:55) stated that "The first step in preserving this population is to prevent any land-use practices that result in the warming or silting of its crucial habitat."

Watershed acidification poses a major potential threat to extant Longnose Sucker populations. Sharp et al., (1999) reported that Pennsylvania forest soils have become more acidic in the latter half of the twentieth century, and that soil acidification is at or approaching levels critical to the maintenance of forest health. Soils in most of the Casselman River drainage in Pennsylvania are rated either "very sensitive" to acidic deposition, or "both very sensitive and non-sensitive soils in the soil association" (Sharp et al., 1999:73).

It is noteworthy, however, that during the 2019 surveys pH values were 7.8 and 8.0 at Elklick Creek stations, 7.9 at two Whites Creek stations, 7.9 in Piney Creek, and 8.3 in Flaugherty Creek.

The buffering capacity of those streams currently occupied by Longnose Suckers is limited. Alkalinity values reported for occupied stations during earlier PFBC surveys include ranges of 6-34 mg/l for Elklick Creek, 16-21 for Flaugherty Creek, 8-19 for Whites Creek, and a value of 8 mg/l for Piney Creek.

2) Direct Mortality:

All four tributaries of the Casselman River presently or recently occupied by Longnose Suckers are stocked annually with trout by PFBC. Whether such activity results in direct predation is unknown, but should be studied.

Electrofishing occurs periodically within the occupied drainages and has historically been conducted with the alternating current waveform. This waveform is known to be highly injurious to fishes. Surveyors should be aware that suckers tent to be sensitive to electrofishing, even with the use of pulsed direct current and take care to not create situations that result in unnecessary injury and potential mortality. New electrofishing equipment provide waveform options that were not available to surveyors in the past. These waveforms should be evaluated for their ability to be effective while producing no or minimal injury when compared to more traditional waveforms.

1) Introduced Species:

Four introduced species were detected during 2019 surveys (PFBC unpublished data). Three species of trout – Rainbow Trout, *Onchorhynchus mykiss*, Brown Trout, *Salmo trutta*, and Brook Trout, *Salvelinus fontinalis* were collected in three of the four streams surveyed, and two species were present in the fourth. Although it is unlikely that these salmonids compete with Longnose Suckers for habitat, they may compete for resources.

A non-native minnow, the Rosyside Dace, *Clinosotmus funduloides* has recently been detected in Flaugherty Creek (PFBC, unpublished data). Its potential impacts to the Longnose Sucker population have not been studied.

## Conservation and Recovery

1) Work towards the protection, conservation, and enhancement of extant populations.
   a. Continue to review appropriate permits through the Environmental Review Program for Longnose Sucker conservation; continue to work with federal and state government agencies to minimize pollution and habitat destruction.
   b. Encourage the development of regulations and policies that would reduce the introduction and spread of aquatic invasive species.
2) Conduct comprehensive status survey of each of the four Casselman River tributaries with extant populations or recent records to:
   a. determine lineal extent of occupation in each stream
   b. determine/estimate populations in each stream and/or occupied reach
   c. obtain current measures of water quality parameters

3) Conduct research projects to describe life history and ecology attributes needed to develop management strategies including the following:
   a. age structure
   b. growth
   c. diet
   d. habitat use
   e. health
   f. influence of anthropogenic perturbations on populations
   g. characterize interaction between the Longnose Sucker and introduced species
4) Conduct genetic assessment comparing the isolated Monongahela River drainage population of the Longnose Sucker with populations in the species' primary contiguous range to determine genetic distinctiveness and eligibility for listing under the Endangered Species Act.

5) Evaluate electrofishing waveforms for injury potential in suckers and effectiveness for monitoring of fisheries (both suckers and trout). Report conclusions to the surveys operating in the area occupied by Longnose Suckers.

## References

Brim Box, J. and J. Mossa. 1999. Sediment, land use, and freshwater mussels: prospects and problems. Journal of the North American Benthological Society 18(1): 99-117.

Arway, J. 1985. Tripple G Coal Somerset County soap case no. 081. Pennsylvania Fish and Boat Commission files. Bellefonte, PA.

Bailey, M. M. 1969. Age, growth, and maturity of the Longnose Sucker *Catostomus catostomus*, of western Lake Superior. J. Fish. Res. Bd. Canada 26: 1289-1299.

Barton, B. A., and B. F. Bidgood. 1980. Competitive feeding habits of rainbow trout, white sucker, and Longnose Sucker in Paine Lake, Alberta. Fisheries Research Report, Fish and Wildlife Division, Alberta 16. 27 pp.

Becker, G.C. 1983. Fishes of Wisconsin. University of Wisconsin Press, Madison. 1052pp.

Black, E.C. 1953. Upper lethal temperatures of some British Columbia freshwater fishes. J. Fish. Res. Board Canada 10(4):196-210.

Boyer, M. R., Jugan, and B. Lorantas. 1979a. Flaugherty Creek stream examination report. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.

Boyer, M. R., Jugan, and B. Lorantas. 1979b. Piney Creek stream examination report. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.

Cooper, E. L. 1983. Fishes of Pennsylvania and the northeastern United States. The Pennsylvania State University, University Park, PA, pp.243.

Criswell, R. W. and D. P. Fischer. 2002. Petition to list the Monongahela River drainage population of the Longnose Sucker (*Catostomus Catostomus* Forster). Pennsylvania Biological Survey.

Daley, T. L. 1999. Benthic macroinvertebrate assessment of the Casselman River. Pennsylvania Fish and Boat Commission files. Bellefonte, PA.

Edwards, P.J., J.N. Kochenderfer, & J.D. Helvey. 1999. Soil water and stream water acidification caused by nitrogen and sulphur amendments, pp. 91-105 *in* The effects of acidic deposition in Pennsylvania's forests, W.E. Sharpe & J.R. Drohan, eds. Proc. 1998 PA Acidic Deposition Conf., Vol. 1. Envir. Resources Research Inst., Univ. Park, PA. 266pp.

Elser, H. J. 1957. The Lake Koshare draining project, 1957. Md. Dept. Res. and Ed., Ref. No. 57-55. Solomons, Md. 3pp.

EPA. 1971. Summary report: Monongahela River mine drainage remedial project. EPA. *In* Proceedings in the matter of pollution of the interstate waters of the Monongahela River and its tributaries in the Pittsburgh, Pennsylvania, Area. U.S. EPA. Region III. 93pp.

Geen, G. H., T. G. Northcote, G. F. Hartman, and C. C. Lindsey. 1966. Life histories of two species of Catostomid fishes in Sixteenmile Lake, British Columbia, with particular reference to inlet stream spawning. J. Fish. Res. Board Canada, 23(11): 1761-1788.

Gilbert, C. R. & D. S. Lee. 1980. *Catostomus catostomus* (Forster), Longnose Sucker. pp. 372 *in* D. S. Lee et al. Atlas of North American freshwater fishes. N. C. State Mus. Nat. Hist., Raleigh, *i-x* 854 pp.

Goldsborough, E. L. & H. W. Clark. 1908. Fishes of West Virginia. Bull. Bur. Fish. Wash., 1907: 28-39.

Harris, R. H. D. 1962. Growth and reproduction of the Longnose Sucker, *Catostomus catostomus* (Forster) in Great Slave Lake. J. Fish. Re. Board Canada, 19(1): 113- 126.

Hendricks, M. L. 1980. The distribution of the fishes of the Youghiogheny River. Master's Thesis, Frostburg State College, Frostburg, Md. 216pp.

Jordan, D. S. 1878. A synopsis of the family Catostomidae. Bull. U.S. Nat. Mus. 12: 97-230.

Mansueti, R. 1957. Rare longnose or sturgeon sucker found in Maryland. Md. Tidewater News. 13(7): 2.

Page, L. M. & B. M. Burr. 2011. Peterson field guide to freshwater fishes of North America North of Mexico. Houghton Mifflin Co., New York, N.Y. 663 pp.

Pennsylvania Fish & Boat Commission. 2019. Endangered species. Title 58 Pennsylvania Code Chapter 75.

Pennsylvania Natural Heritage Program (PNHP). Factsheet. Accessed 2023. https://www.naturalheritage.state.pa.us/factsheets/11350.pdf

Rawson, D. S. & C. A. Elsey. 1950. Reduction in the Longnose Sucker population of Pyramid Lake, Alberta, in an attempt to improve angling. Trans. Am. Fish. Soc., 78(1948): 13-31.

Scott, W. B. & E. J. Crossman. 1973. Freshwater fishes of Canada. J. Fish. Res. Board Canada. Ottawa. 966 pp.

Shaffer, G. 1955. Flaugherty Creek stream investigation. Pennsylvania Fish and Boat Commission files. Bellefonte, PA.

Smith, C.L. 1985. The inland fishes of New York State. NY State Dept. of Conservation, Albany. 522pp.

Smith, G. & R. Lorson. 1999. Casselman River (819F) management report sections 01, 02, & 04. Pennsylvania Fish and Boat Commission files. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.

Stauffer, J. R., J. M. Boltz, & L. R. White. 1995. The fishes of West Virginia. Academy of Natural Sciences, Philadelphia, PA. 389 pp.

Stauffer, J. R., Jr., R. W. Criswell, and D. P. Fischer. 2016. The Fishes of Pennsylvania. Cichlid Press, El Paso, TX. 556 pp.

Trautman, M. B. 1981. The Fishes of Ohio. Ohio State University Press, Columbus.

Weirich, C. B. & M. R. Boyer. 1987a. Elklick stream examination report. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.

Weirich, C. B. & M. R. Boyer. 1987b. Flaugherty Creek stream examination report. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.

Weirich, C. B. & M. R. Boyer. 1988a. Piney Creek stream examination report. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.

Weirich, C. B. & M. R. Boyer. 1988b. Whites Creek stream examination report. Division of Fisheries Management. Fisheries Management Area 8. Somerset, PA.