Catoctin Mountain Park

National Park Service
U.S. Department of the Interior

Fish *Resource Brief*

Importance

Fish and aquatic communities are excellent indicators of watershed health and water quality. They are sensitive to many factors including pollution, stream physical habitat, and diseases and invasive organisms.

Fish are also a vital part of ecosystems, consuming plankton, crustaceans, insects, and other organisms and in turn providing food for birds of prey, river otters, raccoons, and other creatures.



NPS Photo

Brook trout (*Salvelinus fontinalis*)

Monitoring

Fish monitoring is part of a broader effort by the National Capital Region Network (NCRN) Inventory & Monitoring (I&M) program to assess the condition of streams and watersheds.

The NCRN began long-term fish monitoring in 2008. Each summer 5-8 sites are visited, and following a set rotation, the NCRN will visit thirty-seven sites throughout the region every six years. At Catoctin, monitoring is done on Owens Creek, Big Hunting Creek, and Whiskey Still Creek. Fish monitoring is co-located with macroinvertebrate monitoring and stream physical habitat analysis.

The objectives of this combined monitoring are to:

- determine current conditions and track long-term trends in stream condition,
- determine trends in species composition and functional groups of fish and benthic invertebrates,
- detect invasions of non-native fish

Streams monitored are small (first- to third-order) and non-tidal. At each site, monitoring teams electrofish two passes along a designated 75-meter stream segment. Electrofishing uses a mild electric current to stun fish to the water surface where they are netted. Captured fish are counted, identified to species, weighed in aggregate, and released. Any game-fish (trout, bass, walleye, northern pike, chain pickerel, and striped bass) are measured for total length. Symptoms of illness or anomalies in fish are noted and described.

FIBI Scores

The species and number of fish present in a stream segment is used to calculate a Fish Index of Biotic Integrity (FIBI) score for each stream. Scoring takes into account: the number of fish per stream area, the total biomass of fish captured, which species are most abundant, if most fish are disturbance tolerant or generalist feeders, the number of benthic fish (occupying the stream bottom), and the number of fish who need silt-free rocky stream beds to spawn. Scoring also takes into account Catoctin's location in the Eastern Piedmont physiographic province. FIBI scores range from 1 to 5, with four possible ratings: very poor (1-1.99), poor (2-2.99), fair (3-3.99) and good (4-4.99).

Results

Owens Creek and Whiskey Still Creek were sampled in 2010. Big Hunting Creek was sampled in 2006 and 2010. No rare, threatened, or endangered fish species were found during monitoring at Catoctin.

Big Hunting Creek (MONO-230-N)

2010 FIBI = 4 (good)

Species found:

2	American eel (*Anguilla rostrata*)
68	blacknose dace (*Rhinichthys atratulus*)
120	Blue Ridge sculpin (*Cottus caeruleomentum*)
21	brook trout (*Salvelinus fontinalis*)
9	fantail darter (*Etheostoma flabellare*)
63	longnose dace (*Rhinichthys cataractae*)
2	rainbow trout (*Oncorhynchus mykiss*)

Game fish:

21 brook trout, ranging from 95 - 295 mm. Average size: 204 mm

2 rainbow trout. One 79 mm the other 228 mm.

Invasives: none

Big Hunting Creek (MONO-201-N)

2006 FIBI = 3.67 (fair)

2006 Species found:

20 blacknose dace (*Rhinichthys atratulus*)

11 brook trout (*Salvelinus fontinalis*)

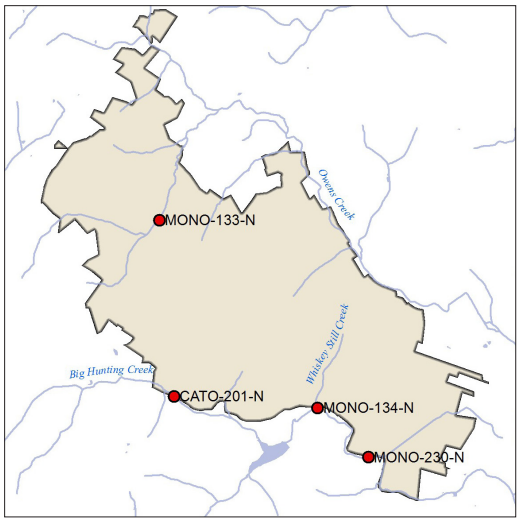
42 brown trout (*Salmo trutta*)

Game fish:

11 brook trout, not measured.

42 brown trout, ranging from 59-217 mm. Average size = 104 mm.

Invasives: none



Catoctin sites monitored for fish, macroinvertebrates, and stream physical habitat.

Owens Creek (MONO-133-N)

2010 FIBI = 4 (good)

Species found:

399 blacknose dace (*Rhinichthys atratulus*)

162 Blue Ridge sculpin (*Cottus caeruleomentum*)

17 brook trout (*Salvelinus fontinalis*)

27 fantail darter (*Etheostoma flabellare*)

13 longnose dace (*Rhinichthys cataractae*)

Game fish:

17 brook trout, ranging from 56 - 225 mm. Average size = 132 mm.

Invasives: none

Whiskey Still Creek (MONO-134-N)

2010 FIBI = 1 (very poor)

Species found:

None

Invasives: none

Discussion

The FIBI scores for Big Hunting Creek and Owens Creek indicate relatively healthy stream conditions, while the score for Whiskey Still Creek was very poor.

The 2010 FIBI score for Big Hunting Creek was good, a slight improvement over its 2006 score. Both years showed a moderate number of fish per stream area, low numbers of disturbance tolerant and generalist fish; and a moderate overall biomass of fish. Although a high number of fish that need silt-free rocky stream bottoms to spawn were found in 2006 and only moderate numbers in 2010, the number of benthic dwelling fish like darters, sculpins, madtoms, and lampreys went up from 2006 to 2010.

The Owens Creek FIBI score was good based on the same criteria noted for Big Hunting Creek except that the number of fish per stream area was high and the number of disturbance tolerant fish was moderate.

Whiskey Still Creek received a poor FIBI score because no fish were found during monitoring. Water quality measures taken at the same time as monitoring were all within a normal range with the exception of dissolved oxygen (DO). DO levels were low, and were measured at 3.9 mg/L. The ecological threshold for DO in trout streams is 6.0 mg/L.

References:

National Capital Region Network Biological Stream Survey Fish Data (2008-2010). Versar, Inc. National Capital Region Inventory and Monitoring Program, Washington, DC. Generic Dataset-2175666. https://irma.nps.gov/App/Reference/Profile/2175666

NCRN Biological Stream Survey – Data Analysis Standard Operation Procedure #20, Version 1.1 (June 2009) [includes instructions for calculating FIBI scores]

NCRN Monitoring Information for Water Quality, Physical Habitat, and Aquatic Macroinvertebrates. http://science.nature.nps.gov/im/units/ncrn/monitoring_products.cfm

Raesly, R.L, et al. 2004. Inventory and Biological Monitoring of Fishes in National Parks of the National Capital Region. TIC #: NCRO D-54. http://science.nature.nps.gov/im/units/ncrn/inventories_fish.cfm