Rock Creek 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.



Photo courtesy of: http://cnre.vt.edu/efish, Bob Jenkins & Noel Burkhead

Blacknose dace (*Rhinichthys atratulus*)

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 Rock Creek monitoring is done in Broad Branch, Fenwick Branch, Hazen Creek, Luzon Branch, Pinehurst Branch, Soapstone Valley Stream, Palisades (Battery Kemble/Maddox Branch) Creek, Piney Branch, Dumbarton, Normanstone, and Klingle Valley. 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 Rock Creek'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

Rock Creek's streams were sampled in 2008 and 2009. No rare, threatened, or endangered fish species were found during monitoring.

Broad Branch (ROCK-205-N)

2008 FIBI = 1.33 (very poor)

Species found:

2	American eel (*Anguilla rostrata*)
319	blacknose dace (*Rhinichthys atratulus*)
1	longnose dace (*Rhinichthys cataractae*)
5	white sucker (*Catostomus commersonnii*)

Game fish: none

Invasives: none

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Dumbarton Oaks (ROCK-109-N)

2009 FIBI = 1.33 (very poor)

Species found:

- 20 American eel (*Anguilla rostrata*)
- 149 blacknose dace (*Rhinichthys atratulus*)
- 1 bluegill (*Lepomis macrochirus*)

Game fish: none
Invasives: virile crayfish (*Orconectes virilis*)

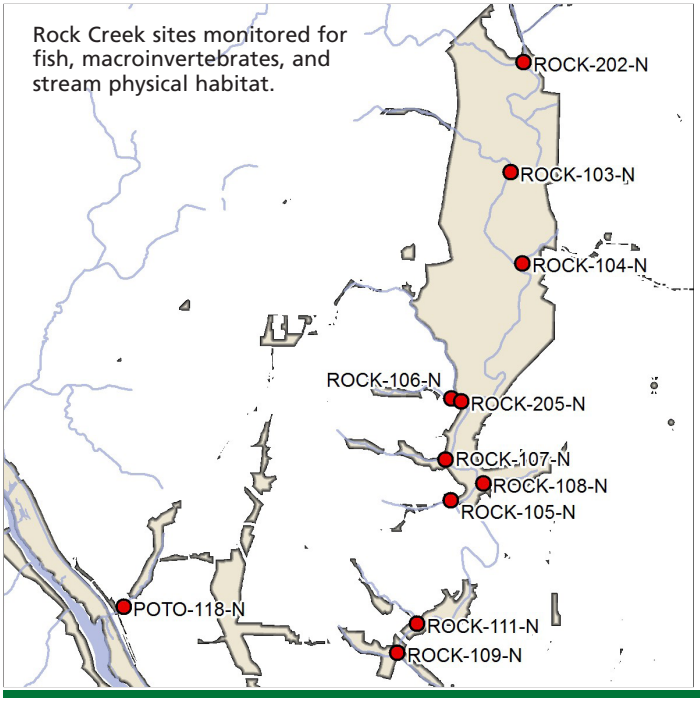
Fenwick Branch (ROCK-202-N)

2008 FIBI = 2.33 (poor)

Species found:

- 1 American eel (*Anguilla rostrata*)
- 370 blacknose dace (*Rhinichthys atratulus*)
- 5 bluntnose minnow (*Pimephales notatus*)
- 5 creek chub (*Semotilus atromaculatus*)
- 4 eastern mosquitofish (*Gambusia holbrooki*)
- 25 longnose dace (*Rhinichthys cataractae*)
- 31 satinfin shiner (*Cyprinella analostana*)
- 26 swallowtail shiner (*Notropis procne*)
- 9 tessellated darter (*Etheostoma olmstedi*)
- 6 white sucker (*Catostomus commersonnii*)
- 55 yellow bullhead (*Ameiurus natalis*)

Game fish: none
Invasives: virile crayfish (*Orconectes virilis*)



Hazen Creek (ROCK-107-N)

2008 FIBI = 2.33 (poor)

Species found:

- 23 American eel (*Anguilla rostrata*)
- 177 blacknose dace (*Rhinichthys atratulus*)
- 1 central stoneroller (*Campostoma anomalum*)
- 3 creek chub (*Semotilus atromaculatus*)
- 2 longnose dace (*Rhinichthys cataractae*)
- 1 tessellated darter (*Etheostoma olmstedi*)

Game fish: none
Invasives: none

Klingle Creek (ROCK-105-N)

2009 FIBI = 1.33

Species found:

- 9 American eel (*Anguilla rostrata*)
- 140 blacknose dace (*Rhinichthys atratulus*)
- 2 pumpkinseed (*Lepomis gibbosus*)

Game fish: none
Invasives: virile crayfish (*Orconectes virilis*)

Luzon Branch (ROCK-104-N)

2008 FIBI = 1 (very poor)

Species found:

- 154 blacknose dace (*Rhinichthys atratulus*)
- 11 longnose dace (*Rhinichthys cataractae*)

Game fish: none
Invasives: none

Normanstone Branch (ROCK-111-N)

2009 FIBI = 1 (very poor)

Species found:

- 1 blacknose dace (*Rhinichthys atratulus*)

Game fish: none
Invasives: virile crayfish (*Orconectes virilis*)

Palisades Creek (POTO-118-N)

2009 FIBI = 1.67 (very poor)

Species found:

3 American eel (*Anguilla rostrata*)

Game fish: none
Invasives: virile crayfish (*Orconectes virilis*)

Pinehurst Branch (ROCK-103-N)

2008 FIBI = 1.33 (very poor)

Species found:

148 blacknose dace (*Rhinichthys atratulus*)
9 creek chub (*Semotilus atromaculatus*)
2 white sucker (*Catostomus commersonnii*)
2 yellow bullhead (*Ameiurus natalis*)

Game fish: none
Invasives: none

Piney Branch (ROCK-108-N)

2009 FIBI = 2.67 (poor)

Species found:

57 American eel (*Anguilla rostrata*)
176 blacknose dace (*Rhinichthys atratulus*)
134 bluntnose minnow (*Pimephales notatus*)
2 cutlips minnow (*Exoglossum maxillingua*)
4 eastern mosquitofish (*Gambusia holbrooki*)
7 green sunfish (*Lepomis cyanellus*)
1 largemouth bass (*Micropterus salmoides*)
5 longnose dace (*Rhinichthys cataractae*)
3 redbreast sunfish (*Lepomis auritus*)
96 satinfin shiner (*Cyprinella analostana*)
32 swallowtail shiner (*Notropis procne*)
16 white sucker (*Catostomus commersonnii*)
12 yellow bullhead (*Ameiurus natalis*)

Game fish: 1 largemouth bass, 66 mm.
Invasives: none

Soapstone Valley Stream (ROCK-106-N)

2008 FIBI = 1.67 (very poor)

Species found:

6 American eel (*Anguilla rostrata*)
366 blacknose dace (*Rhinichthys atratulus*)
8 longnose dace (*Rhinichthys cataractae*)
3 white sucker (*Catostomus commersonnii*)

Game fish: none
Invasives: none

Discussion

The FIBI scores for Rock Creek streams all fell into the poor to very poor range. The low scores come from a number of factors. None of the streams monitored had fish that require silt-free rocky stream bottoms to spawn. All except Piney Branch and Palisades Creek had high numbers of disturbance tolerant species and though there was slight variation, generalist species dominated all sites. All streams except Piney Branch and Soapstone had low fish biomass, but the number of fish per stream area varied widely.

Numbers of stream bottom (benthic) dwelling fish like darters, sculpins, madtoms, and lampreys were low or not present at all sites except Fenwick Branch and Hazen Creek both of which had high numbers.

The number of different species were quite low in Normanstone Branch (1) and Palisades Creek (3).

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/monitor/stream_survey/index.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. https://irma.nps.gov/App/Reference/Profile/580767.