Wolf Trap NP for Performing Arts

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

White sucker (*Catostomus commersonnii*)

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.

Long-term fish monitoring at thirty-seven park sites throughout the NCRN began in 2008 and follows a set, six-year rotation. Each summer 5-8 sites are visited. At Wolf Trap National Park for the Performing Arts (WOTR) monitoring is done in Courthouse Creek and Wolftrap 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 factors such as the abundance of fish that are disturbance tolerant, dominant, insectivorous, omnivorous, or benthic (occupying the lowest level of a body of water). Scoring also takes into account a Wolf Trap's location in the Coastal Plain FIBI region. 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

Fish in Courthouse and Wolftrap Creeks were monitored in 2012. Wolftrap Creek was also sampled in 2006 while monitoring protocols were under development. All recent FIBI scores indicate relatively healthy stream conditions for fish.

No rare, threatened, or endangered fish species were found in either creek. Presence of the invasive virile crayfish (*Orconectes virilis*), red swamp crawfish (*Procambarus clarkii*), or rusty crayfish (*Orconectes rusticus*) were not detected.

Courthouse Creek (DIFF-202-N-2012)

2012 FIBI = 3.33 (fair)

Species found:

3	American eel (*Anguilla rostrata*)
307	blacknose dace (*Rhinichthys atratulus*)
72	central stoneroller (*Campostoma anomalum*)
48	creek chub (*Semotilus atromaculatus*)
83	longnose dace (*Rhinichthys cataractae*)
1	redbreast sunfish (*Lepomis auritus*)

17 rosyside dace (*Clinostomus funduloides*)
1 satinfin shiner (*Cyprinella analostana*)
5 tesselated darter (*Etheostoma olmstedi*)
5 yellow bullhead (*Ameiurus natalis*)

Game fish: none

Invasive crayfish: none

Wolftrap Creek (DIFF-201-N-2012)

2012 FIBI = 3.67 (fair)

Species found:

3 American eel (*Anguilla rostrata*)
220 blacknose dace (*Rhinichthys atratulus*)
1 bluegill (*Lepomis macrochirus*)
101 central stoneroller (*Campostoma anomalum*)
33 common shiner (*Luxilus cornutus*)
70 creek chub (*Semotilus atromaculatus*)
3 cutlips minnow (*Exoglossum maxillingua*)
3 green sunfish (*Lepomis cyanellus*)
128 longnose dace (*Rhinichthys cataractae*)
3 margined madtom (*Noturus insignis*)
5 pumpkinseed (*Lepomis gibbosus*)
8 redbreast sunfish (*Lepomis auritus*)
54 rosyside dace (*Clinostomus funduloides*)
9 satinfin shiner (*Cyprinella analostana*)
27 spotfin shiner (*Cyprinella spiloptera*)
33 swallowtail shiner (*Notropis procne*)
41 tesselated darter (*Etheostoma olmstedi*)
30 white sucker (*Catostomus commersonnii*)
6 yellow bullhead (*Ameiurus natalis*)

Game fish: 2 largemouth bass, ranging from 100 - 111 mm. Average size: 106 mm.

Invasive crayfish: none

Wolftrap Creek (DIFF-201-N-2006)

2006 FIBI = 4.33 (good)

2006 Species found:

5 American eel (*Anguilla rostrata*)
237 blacknose dace (*Rhinichthys atratulus*)
4 bluegill (*Lepomis macrochirus*)
158 central stoneroller (*Campostoma anomalum*)
1 common shiner (*Luxilus cornutus*)



Sites in Wolf Trap monitored for fish, macroinvertebrates, and stream physical habitat condition.

19 creek chub (*Semotilus atromaculatus*)
5 green sunfish (*Lepomis cyanellus*)
22 longnose dace (*Rhinichthys cataractae*)
2 pumpkinseed (*Lepomis gibbosus*)
3 redbreast sunfish (*Lepomis auritus*)
34 rosyside dace (*Clinostomus funduloides*)
28 spotfin shiner (*Cyprinella spiloptera*)
11 swallowtail shiner (*Notropis procne*)
32 tesselated darter (*Etheostoma olmstedi*)
46 white sucker (*Catostomus commersonnii*)
1 yellow bullhead (*Ameiurus natalis*)

Game fish: none

Invasive crayfish: none

Wolftrap Creek (DIFF-201-N-2004)

2004 FIBI = 2.11 (poor)

2004 Species found:

4 American eel (*Anguilla rostrata*)
164 blacknose dace (*Rhinichthys atratulus*)
4 bluegill (*Lepomis macrochirus*)
3 creek chub (*Semotilus atromaculatus*)
1 green sunfish (*Lepomis cyanellus*)

9	longnose dace (*Rhinichthys cataractae*)
15	pumpkinseed (*Lepomis gibbosus*)
9	rosyside dace (*Clinostomus funduloides*)
8	satinfin shiner (*Cyprinella analostana*)
8	swallowtail shiner (*Notropis procne*)
11	tesselated darter (*Etheostoma olmstedi*)
28	white sucker (*Catostomus commersonnii*)
5	yellow bullhead (*Ameiurus natalis*)

Game fish: 2 largemouth bass, ranging from 31-34 mm. Average size: 33 mm.

Invasive crayfish: none

Discussion

Recent FIBI scores for both Courthouse Creek and Wolf Trap Creek indicate healthy stream condition.

In 2012 Courthouse Creek received a fair FIBI score based on a good abundance of fish and good populations of benthic fish like darters, sculpins, and madtoms. The stream contained moderate numbers of pollution tolerant and generalist species, low numbers of fish that need silt-free rocky stream bottoms to spawn, and a moderate overall biomass of fish. Ten taxa were found.

Assessments for Wolf Trap Creek improved dramatically between 2004 and 2006 (possibly the result of dry conditions in 2004) and then dropped slightly in 2012. The number of fish species collected increased from 14 in 2004 to 16 in 2006 to 20 in 2012. In 2012, Wolf Trap had good numbers of benthic fish species, a moderate number of pollution tolerant and generalist species, moderate numbers of fish that need silt-free rocky stream bottoms to spawn, and a moderate overall biomass of fish.

References:

National Capital Region Network Biological Stream Survey Fish Data (2008-2012). Versar, Inc. National Capital Region Inventory and Monitoring Program, Washington, DC. Generic Dataset-2195180. https://irma.nps.gov/App/Reference/Profile/2195180

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/DownloadDigitalFile?code=456458&file=ncrn_fish_inv_report.pdf