

## Whirling Disease in Maryland - 2007

Although whirling disease (WD) presence in Maryland was documented as early as 1995, it became a larger issue in early 2007 with the discovery of infected fish at the Bear Creek hatchery in the Youghiogheny River basin (Figure 1). This was the first documentation in Maryland outside of the North Branch Potomac River (NBPR). While Maryland Department of Natural Resources (MDNR) had not found direct evidence of negative impacts to trout populations in the NBPR associated with WD, the occurrence outside of that basin demonstrated the potential for spread of this organism. Nationally, impacts of *Myxobolus cerebralis* have ranged from undetectable to devastating with the severity of each case difficult to predict. As a result MDNR decided to take aggressive action to stem the spread to new waters of the state and to the extent possible to limit the ability of the organism to perpetuate itself within its current range.

A multifaceted approach was taken to deal with *Myxobolus* which included the following steps.

- All coldwater production facilities were tested, leading to closure of the three facilities which tested positive (Bear Creek, Mettiki, Jennings Randolph (JR) net-pens) and the destruction of all infected or exposed trout from those facilities.
- New bio-security protocols were established for all MDNR facilities and projects which have the potential to come into contact with *Myxobolus*.
- A two-pronged, statewide testing program was established which consisted of sampling resident trout populations, exposing 'sentinel' fry to instream waters for a prerequisite period and testing for infection.
- Surface waters were filtered in an attempt to identify the free floating TAM stage of the organism. The testing included streams with wild or holdover (resident) trout populations and all production facilities. The TAM sampling information will be supplemental information to the definitive two-pronged fish sampling.
- An 'Angler Awareness' program was initiated to enlist the help of all potential user groups in control of this and other diseases and invasive organisms.

## Statewide Test Results

Extensive sampling in the Bear Creek drainage found evidence of *Myxobolus* in the hatchery and in the mainstem of Bear Creek immediately downstream of the discharge. Samples taken in March of 2007 found infected brook and rainbow trout below the hatchery while brown trout from that same sample were negative. Sampling conducted over the remainder of the year in Bear Cr. found no other evidence of the organism or the disease. This included sites on the mainstem and tributaries above and below the hatchery as well as the previously infected area.

The Barnum area of the North Branch Potomac, site of the original introduction, continued to produce positive samples. However at the mouth of Folly Run, just two rivermiles downstream from the JR Dam a sample of brook and brown trout were not infected. All sites sampled downstream of Folly Run including samples from the Savage

River above and below the reservoir were negative as well. Positive samples were found at the Mettiki production facility and in Sand Run below the Mettiki discharge.

Resident populations elsewhere across the state including Antietam Creek, Big Hunting Creek and the Gunpowder Falls showed no evidence of *Myxobolus*. Statewide testing results are shown in [Figure 1](#). Detailed results can be found in Appendix 1. It is worth noting that no brown trout have tested positive in Maryland regardless of the location from which they were collected.

## Angler Education

MDNR views the process of educating and enlisting the public's help as critical to controlling the spread of whirling disease within Maryland and to trout fisheries in other states. In 2007, we adopted and [modified signage](#) originally developed by NM Department of Fish and Game which helps anglers understand the steps they can take to help reduce the spread of whirling disease. Staff posted and is maintaining these informational signs in key trout fishing areas throughout the state. We gave presentations, posted educational materials on the MD DNR Fisheries Service's website, and developed ['a tips card'](#) to be distributed with fishing licenses and elsewhere. A message on preventing the spread of diseases and invasive species was also included in the 2008 Fishing Guide. Our goal is to continue to educate the public on the status of whirling disease in Maryland and how anglers can help.

MDNR exchanged information through a series of meetings and conference calls with its partners. We received a significant amount of help in the form of advice from nationally recognized experts on WD, in developing educational materials and in seeking the public's cooperation. We would like to thank many including the Whirling Disease Initiative, Whirling Disease Foundation, Trout Unlimited, Federation of Fly Fishers, and local shops and guides for their assistance.

## Future Outlook

The 2007 survey results indicate that *Myxobolus cerebralis* has remained mostly confined to the Barnum area of the NBPR and has not impacted resident trout populations across the state. However, the appearance of the organism in wild fish in Bear Creek and its reappearance at Mettiki demonstrate the potential for the organism to establish beyond the NBPR and Barnum area. It also points out the need for measures to prevent the introduction of other fish pathogens. The current *Myxobolus* occurrence has provided a wake up call that more stringent measures need to be taken to protect the fish populations across the State. This calls for a renewed effort on the part of MDNR Fisheries Service and the public to follow safety procedures as described in the various print and web material.

MDNR will continue testing its production facilities and resident trout populations. If Bear Creek remains disease free some limited production may be performed at the hatchery in 2008. However numbers will be kept low to be able to respond quickly and minimize risk to the watershed should the organism show up in our sampling. The two satellite facilities, Mettiki and the JR net pens, are less likely to be brought back on line due to the inability to completely disinfect them and other water quality issues. We will look to expand production at our other facilities where feasible and will continue to use private contractors to augment numbers as necessary.

## Adult Stocking

Opening day will be March 29 this year. While Bear Cr. and the two small hatchery facilities are still closed due to disease we have contracted with private vendors to supplement production. Numbers will increase over 2007 by 13,000 trout. These will be augmented by approximately 4,000 early season trout stocked by the West Virginia DNR in the Barnum area and a generous number of quality size trout donated by the Freshwater Institute to be stocked in waters of the state.

# Appendix 1.

## Whirling Disease Testing Results

(as of 12/31/07)

### Wild Trout Testing for Whirling Disease

Note: YOY = young-of-year trout

<i>Waters</i>	<i>Location</i>	<i>Species</i>	<i>Results</i>	<i>Date Collected</i>
Bear Creek	below hatchery	brook	<b>positive</b>	12-Mar-07
Bear Creek	below hatchery	rainbow	<b>positive</b>	12-Mar-07
Bear Creek	below hatchery	brown	negative	12-Mar-07
Bear Creek	above hatchery	brook	negative	5-Mar-07
North Branch Potomac River	Below JR Dam	rainbow	<b>positive</b>	5-Oct-06
Sand Run	Below Mettiki	rainbow	<b>positive</b>	7-Nov-95
		brown	negative	7-Nov-95
Upper Savage River	downstream Poplar Lick	brook	negative	7-May-07
Lower Savage River	mouth	brook	negative	8-May-07
Lower Savage River	mouth	brown	negative	8-May-07
Hunting Creek	Hemlock Bridge	brook	negative	21-Aug-07
		brown	negative	21-Aug-07
	Elbow pool	brown	negative	21-Aug-07
Bear Creek	below wild area	brook	negative	21-Aug-07
		brown	negative	21-Aug-07
Little Bear Creek	below hatchery	brook YOY	negative	21-Aug-07
		brook adult	negative	21-Aug-07
Fikes Run	adult + yoy	brook trout	negative	3-Sep-07
	yoy	brown adult	negative	3-Sep-07
Folly Run	central	brook adult	negative	4-Sep-07
		brook YOY	negative	4-Sep-07
		brown YOY	negative	4-Sep-07
		rainbow YOY	negative	4-Sep-07
North Branch Potomac River	McCool Black Oak	rainbow 1+ wild	negative	5-Nov-07
	Piedmont McCool	rainbow 1+ wild	negative	5-Nov-07
North Branch Potomac River	Lower Catch and Release	Brown 1+ wild	negative	22-Oct-07
Gunpowder Falls	Dam/falls station	brown yoy wild	negative	4-Oct-07
		Brown 1+ wild	negative	4-Oct-07
Gunpowder Falls	Dam/falls station	Rainbow 1+	negative	11-Dec-07

## Trout Facility Testing for Whirling Disease

Note: YOY = young-of-year trout

<i>Facilities</i>	<i>County</i>	<i>Species</i>	<i>Age</i>	<i>Results</i>	<i>Date Collected</i>
Mettiki	Garrett	rainbow	adult	<b>positive</b>	12-Jan-07
Bear Creek	Garrett	rainbow	adult 1+	<b>positive</b>	16-Jan-07
Albert Powell	Washington	rainbow	adult 1+	negative	19-Jan-07
Bear Creek	Garrett	rainbow	adult 1+	<b>positive</b>	26-Feb-07
		rainbow	adult 1+	negative	26-Feb-07
		rainbow	adult 1+	negative	2-Mar-07
Mettiki - all raceways	Garrett	rainbow	adult	<b>positive</b>	5-Mar-07
		brown	adult	negative	5-Mar-07
		cutthroat	adult	negative	5-Mar-07
Murley Branch	Allegany	cutthroat	fingerling	negative	5-Mar-07
		brown	fingerling	negative	5-Mar-07
Unicorn	Queen Anne's	rainbow	adult 1+	negative	19-Apr-07
Jennings Randolph net pens	Garrett	rainbow	adult	<b>positive</b>	11-Apr-07
		brown	adult	negative	11-Apr-07
Albert Powell	Washington	rainbow	fingerling	negative	11-May-07
Bear Creek	Garrett	rainbow	fingerling	negative	11-May-07
Cedarville	Prince George's	rainbow	adult 1+	negative	30-May-07
Montevue Spring Coop	Frederick	brown	adult 1+	negative	30-May-07
Cushwa's	Washington	brown	adult 1+	negative	23-Aug-07
		rainbow	adult 1+	negative	23-Aug-07
		rainbow	adult 1+	negative	23-Aug-07
Albert Powell	Washington	rainbow	adult 1+	negative	5-Nov-07
Unicorn	Queen Anne's	rainbow	adult 1+	negative	25-Jan-08
Cedarville	Prince George's	rainbow	adult 1+	negative	30-Jan-08

## Sentinel Trout Testing

Sentinel trout testing is conducted by exposing Kamloops rainbow swim-up fry to waters for at least two weeks in exposure cages and then conducting DNA testing on the fry for the whirling disease parasite.

<i>Waters</i>	<i>Location</i>	<i>Results</i>	<i>StopDate</i>
Deep Creek Lake	Tailrace	cage stolen	none
Youghiogheny River	C&R - Hoyes	negative	13-Jun-07
Hoyes Run	Mouth	sample lost at lab	13-Jun-07
Bear Creek	Intake	negative	13-Jun-07
	Below intake	negative	13-Jun-07
	Below pond	negative	13-Jun-07
	1.5 miles below pond	negative	13-Jun-07
North Branch Potomac River	Gorman	negative	13-Jun-07
	Natural Propagation	<b>positive</b>	13-Jun-07
	Upper C&R	<b>positive</b>	13-Jun-07
	Lower C&R	sample lost at lab	13-Jun-07
	Zero Creel - McCoole	negative	13-Jun-07
	Zero Creel - Black Oak	negative	13-Jun-07
	Zero Creel - Pinto	fish died in cage – high temperatures	13-Jun-07
Sand Run	downstream of Mettiki	fish died in cage – high temperatures	13-Jun-07
North Branch Potomac River	Lower C&R	negative	5-Nov-07
Bear Creek	Below intake	negative	5-Nov-07
	Fish Hatchery Rd below hatchery	negative	5-Nov-07
	above Friendsville	negative	5-Nov-07
	Intake	negative	5-Nov-07
Savage River	Mouth	sample decomposed before shipping	5-Nov-07
Youghiogheny River DH	Friendsville	sample decomposed before shipping	5-Nov-07
Youghiogheny River	Catch and Release	sample decomposed before shipping	5-Nov-07
Cushwa's Station	spring	negative	5-Nov-07
	discharge	negative	5-Nov-07