



# EarthWatch Rhode Island



**Topic: Fish Sampling and the Health of Rhode Island's Waters**

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## **Background**

Fish populations are vital elements of Rhode Island's water bodies. The Department of Environmental Management (DEM) samples fish populations to measure fish health as well as the health of the rivers and streams they live in. The sampling is done by The Freshwater Fisheries section of the Division of Fish and Wildlife of DEM.

## **Electrofishing**

The most preferred and efficient means of sampling the fish population is electrofishing. It is performed by sending out a current of electricity into the water from a backpack unit, which causes a muscle reaction in the fish and puts them into a temporary state of unconsciousness. The stunned fish are then netted, placed into a bucket, measured, and tallied by species. Afterwards they are put back into the water unharmed. The temperature, pH, dissolved oxygen, and conductivity levels of the water are tested and flow measurements are taken.



**DEM Fish and Wildlife staff use electrofishing to sample the fish population in the Potowomut Pond.**

## **What Fish Surveying Tells Us**

*Fish community composition:* Determining which species are present in a body of water tells us a lot about the health of the river or stream. Certain types of fish, like brook trout or river herring, need flowing water for all or part of their lifecycle. These fish are the most sensitive to water withdrawals. Other types of fish, such as pumpkinseed or pickerel, are more tolerant of decreases in water flow.

The presence of Brook Trout, for example, tells us that the water has sufficient flow and is not impacted by temperature increases or groundwater withdrawal. Locations downstream of significant water withdrawals could become altered and have fish communities comprised of temperature tolerant species and fish that are able to cope with reduced flows.



**A pumpkinseed fish is measured during the fish sampling study.**

*Fish abundance:* For each hour of fishing, the number of each species caught is recorded. This information can be logged over a long period of time to analyze the relative abundance of each type of fish in each body of water.

*Population dynamics:* DEM has conducted a 10 year survey of the fishes of Rhode Island. It is important to know the distribution and presence of fish species throughout the state to have a record of what is here and additionally so that changes in populations can be tracked in the future.

Studying the health of the fish population is the best way to measure the quality of the water body itself. If certain species of fish in the river are numerous and healthy, then the water they live in is plentiful and contains all the nutrients they need. Likewise, if their population is declining and they are not reproducing, it is usually a direct correlation to the quality of their water environment. An unhealthy fish community can also mean that too much water has been withdrawn and water levels have dropped below that which is necessary for their protection and health. Fish directly reflect the quality of their environment, which is what makes them good subjects to observe.

### **Case Study: The Hunt River**

The Hunt River and its tributaries comprise one of Rhode Island's main watersheds, and is located in Warwick, North Kingstown, Coventry, and Exeter. Increased suburban development has led to an increase in water withdrawal in the river basin. For two weeks in August of 2005, the water level was actually depleted to just 10% of its average flow due to heavy withdrawals; far too low to continue protecting its aquatic environment.

Analysis of the Hunt River basin has shown that fish populations have changed significantly in the past ten years.

The RI Rivers Council has listed the Hunt River situation as critical. At this time, however, there are no minimum stream flow requirements for the basin or for the state, and setting these standards will be a lengthy process. In lieu of these regulations it is imperative that neighboring residents and businesses practice conservation measures.



**Low water levels in a stream off Potowomut Pond threaten the aquatic environment.**

DEM's Fish and Wildlife Division will continue sampling fish populations to document changes and record any potential correlations between water withdrawal and the health of the fish community. The results from past samplings have already begun to show significant changes, and it remains to be seen how actions by Rhode Islanders will affect this critically impacted fresh water body.

**Interview:**

- Veronica Masson, DEM Principal Fisheries Biologist, discussed fish surveying – why it's important, described how electrofishing is done, and how the information is used, with the Hunt River as a specific example.



**DEM's Veronica Masson is interviewed by Channel 10 along the banks of the Potowomut Pond.**