



# Environmental Dashboard

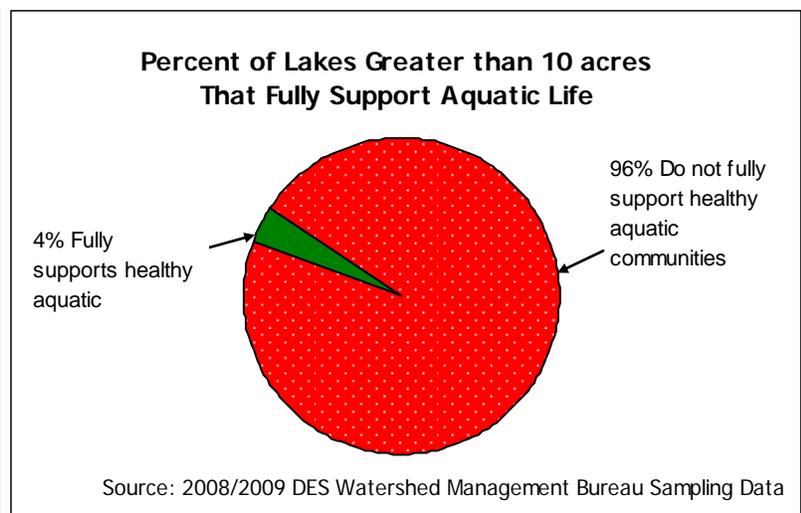
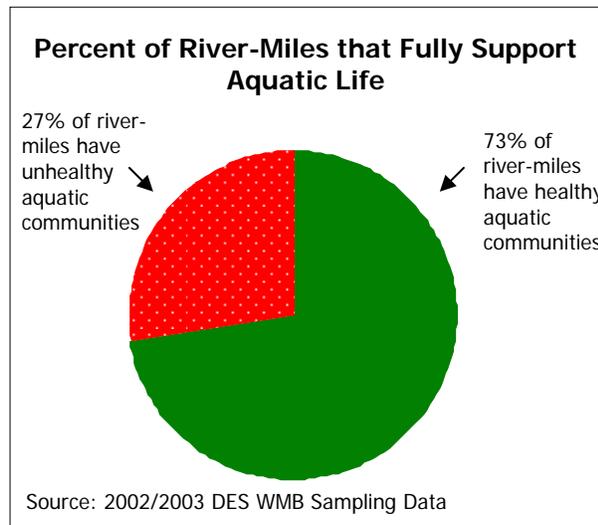


## Trends in New Hampshire's Environment Lakes/Ponds and Rivers/Streams: Aquatic Life

To assess the health of our rivers and lakes, DES looks at a variety of parameters. For rivers, we assess the types and numbers of bottom-dwelling insects present. These insects are sensitive to pollution, and thus provide a direct measure of water quality. For lakes, because DES does not have an established direct measure of aquatic life condition, such as insects, we instead measure indirect indicators are measured, such as dissolved oxygen, pH, and nutrients.

### Current Conditions

In random samples, approximately 73% of rivers demonstrated a balanced community of insects. For lakes, only about 4% of lakes showed ideal conditions to support aquatic life.



### Explanation of Indicator and Trend\*

**Rivers/Streams** To assess the health of aquatic life, the survey looked at the types of aquatic insects, or macroinvertebrates, living on the river bottom. These insects are critical in the food chain for other aquatic life, such as fish. The results from a 2002-2003\* random survey showed that approximately 73% of the sampled sites had healthy macroinvertebrate communities. Twenty-seven percent of the sampled sites revealed unbalanced communities of aquatic insects indicating degraded water quality.

**Lakes/Ponds** A random survey conducted in 2008-2009 looked at indirect indicators of aquatic community health including dissolved oxygen, pH, nutrients, and the presence of invasive plants. This survey showed that 96% of lakes demonstrated some form of impairment to aquatic life. The primary cause was low pH, as a result of acid rain. Since the

industrial revolution, the burning of fossil fuels has resulted in the deposition of sulfuric and nitric acids to our environment, damaging trees, buildings and surface waters. In the 2008-2009 survey, 84% of lakes had a pH of less than 6.5 – a level that can adversely impact fish and aquatic insects.

The second major threat to aquatic life is excess nitrogen and phosphorus, which encourages plant and algal growth. As these plants die and decay, dissolved oxygen levels in the water are reduced due to microbial decomposition. Dissolved oxygen is necessary to support a healthy aquatic life community. A significant source of nitrogen and phosphorus is stormwater runoff, which can contain excess nutrients from animal wastes as well as fertilizers from lawns and farms.

\*One of the goals of the State water quality criteria is to maintain a healthy aquatic community. Since DES does not have the resources to monitor all 17,000 river-miles and more than 1,000 lakes and ponds, a statistically valid random sample is collected from waterbodies across the state. This involves an intensive effort over the summer months of two to three years. For rivers and streams, the last reported results are for 2002-2003. The samples were collected again in 2008–2010 and were recently processed by an EPA contractor. DES will be performing a statistical analysis for comparison to the 2002-2003 dataset and will update the current condition accordingly.

### **How Does DES Address This?**

Protecting the state's water quality is one of DES's highest priorities. Utilizing results from various monitoring programs, including the New Hampshire Volunteer River Assessment Program (VRAP) and the DES Volunteer Lake Assessment Program, DES is able to identify waterbodies that may be in need of restoration or further protection. DES offers training and resources to hundreds of volunteers who regularly sample and monitor our rivers and lakes for contaminants and the presence of exotic weeds. DES also provides funding opportunities for organizations to identify pollution sources and to implement solutions to ensure that the water quality throughout the state maintains its high value.

To address the low pH of surface waters, DES has worked both nationally and locally to decrease sulfur dioxide and nitrogen oxides, the air pollutants that cause acid rain. Since the 1980s we have achieved significant reductions from both state and national efforts. In 2010 the US EPA established a new health based sulfur dioxide standard and finalized new rules in 2011 that require over 20 states to make additional reductions in sulfur dioxide and nitrogen oxides emissions which should help to decrease pollution transported to downwind states like New Hampshire.

### **For More Information, Including What You Can Do to Help**

- DES Surface Water Quality Assessment Program  
<http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>
- DES Biomonitoring Program  
<http://des.nh.gov/organization/divisions/water/wmb/biomonitoring/index.htm>
- DES Volunteer Lake Assessment Program  
<http://des.nh.gov/organization/divisions/water/wmb/vlap/index.htm>
- DES Volunteer Rivers Assessment Program  
<http://des.nh.gov/organization/divisions/water/wmb/vrap/index.htm>
- DES Volunteer Weed Watcher Program  
[http://des.nh.gov/organization/divisions/water/wmb/exoticspecies/weed\\_watcher.htm](http://des.nh.gov/organization/divisions/water/wmb/exoticspecies/weed_watcher.htm)
- Stormwater <http://des.nh.gov/organization/divisions/water/stormwater/index.htm>
- Memo on the Riverine Probabilistic Assessment  
[http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/documents/appendix\\_24\\_pbm\\_stream.pdf](http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/documents/appendix_24_pbm_stream.pdf)
- New England Wadeable Streams Study (NEWS)  
<http://www.epa.gov/region1/lab/news.html>

- National Aquatic Resource Surveys  
[http://water.epa.gov/type/watersheds/monitoring/aquaticsurvey\\_index.cfm](http://water.epa.gov/type/watersheds/monitoring/aquaticsurvey_index.cfm)
- DES Rivers Management and Protection Program  
<http://des.nh.gov/organization/divisions/water/wmb/rivers/index.htm>

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