

The National Rivers and Streams Assessment

2008-2009: A Collaborative Survey

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The National Rivers and Streams Assessment (NRSA) is a study of all rivers and streams of the U.S., from the largest “great rivers” to the smallest headwater streams. It was conducted using standard statistical survey techniques: sites were selected at random to represent the condition of all rivers and streams in regions that share similar characteristics. This is the first time a national monitoring study of the overall condition of streams and rivers has been conducted using this statistically-valid approach. State and tribal water quality agencies, with support from EPA, conducted this work using the same methods at all sites to ensure that results can be compared across the country.

Key Findings: Overall Biological Condition

- 55% of the nation’s river and stream miles do not support healthy populations of aquatic life, with phosphorus and nitrogen pollution and poor habitat the most widespread problems.
- 23% of river and stream miles are in fair condition.
- 21% are in good condition and support healthy biological communities.



Overall Biological Condition

Leading Problems: Nutrient Pollution and Habitat Degradation

- 40% of the nation’s river and streams miles have high levels of phosphorus. 27% have high levels of nitrogen.
- Biological communities are at increased risk for poor condition when phosphorus and nitrogen pollution levels are high.
- Phosphorus and nitrogen pollution comes from excess fertilizers, wastewater and other sources, and can cause algae blooms, low oxygen levels, and more.
- Poor vegetative cover and high levels of human disturbance near river and stream banks are also widespread, reported in 24% and 20% of the nation’s river and stream miles respectively.
- These habitat conditions make rivers and streams more vulnerable to flooding, contribute to erosion and allow more pollutants to enter waterways.
- Excess levels of streambed sediments, which can smother the habitat where many aquatic organisms live or breed, are reported in 15% of river and stream miles. Excess sediments are found to have a significant impact on biological condition.

Changes in Stream Condition

Compared to the findings of the 2004 Wadeable Streams Assessment, the NRSA found some significant changes in stream condition:



- 7% fewer stream miles are in good biological condition;
- 19% fewer stream miles are in good condition for phosphorus;
- 9% more stream miles are in good condition for nitrogen;
- 17% more stream miles are in good condition for in-stream fish habitat; and
- 12% more stream miles are in good condition as measured by riparian disturbance.

These changes are for streams only, between two points in time; future surveys and additional data are needed to discern trends and the reasons for those trends.

Human Health Indicators

Two indicators that provide insight into potential risks to human health were assessed: enterococci (bacteria) and mercury in fish tissue. The report finds that:

- In 9% of U.S. river and stream miles, enterococci bacteria exceed thresholds protective of human health.
- Over 13,000 miles of rivers are found to have mercury in fish tissue at levels that exceed thresholds protective of human health.



Small streams, such as headwater streams, are a critical part of the ecosystem and provide food and shelter to a broad array of aquatic organisms, birds, and wildlife.

Implications of the Survey

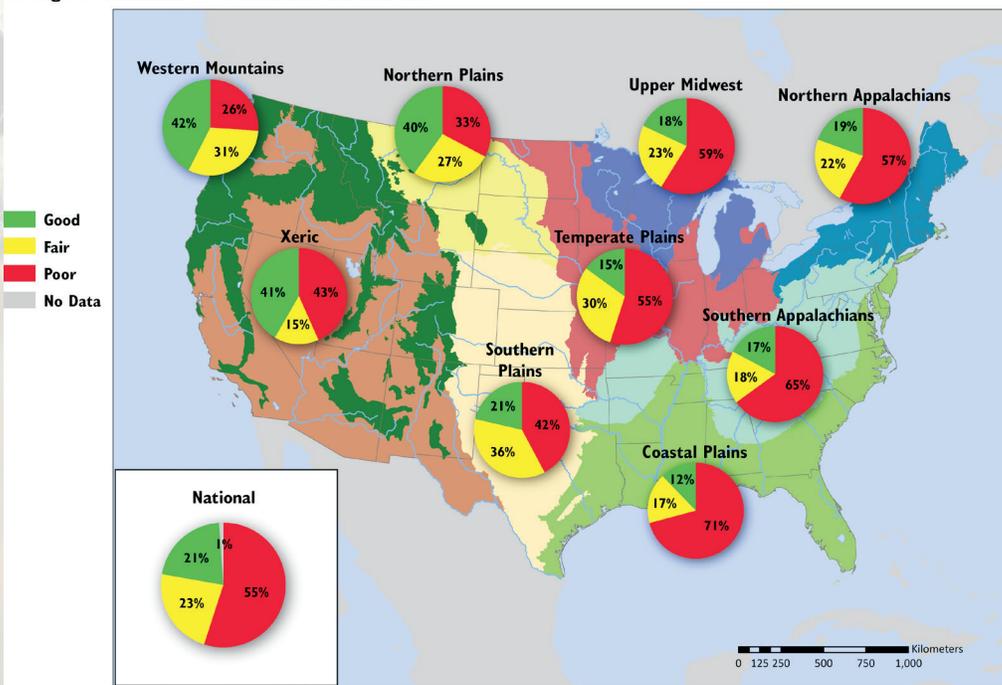
Our rivers and streams are under significant stress. Reducing nutrient pollution and improving habitat will significantly improve the biological health of rivers and streams and support important uses such as swimming and fishing. This survey suggests that, although many actions are underway to protect our rivers and streams, we need to address the many sources of pollution — including runoff from urban areas, agricultural practices, and wastewater — in order to ensure healthier waters for future generations.



Researchers measured chemical pollutants such as nutrients, salinity, and acidification, as well as physical habitat characteristics such as streambed sediments and streambank vegetative cover. They then examined the relationship between these indicators and biological health.

Biological Condition by Ecological Region

Biological Condition — Macroinvertebrate MMI



This biological rating is based on an index that combines different measures of the condition of aquatic macroinvertebrates (aquatic insects like the stoneflies pictured above and other creatures such as crayfish). Aquatic insects serve as excellent indicators of overall water quality.

The NRSA includes analysis of biological condition in each of the nine ecological regions of the U.S.

EPA has produced reports using a similar approach for other waterbody types (The Wadeable Streams Assessment, The National Lakes Assessment, and The National Coastal Condition Report). A report on national wetland condition is underway. To learn more about these National Aquatic Resource Surveys, visit www.epa.gov/aquaticsurveys.