

USING BIOLOGICAL MONITORING DATA TO ASSESS BIODIVERSITY CONSERVATION IN THE DELAWARE RIVER BASIN

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ABSTRACT

The Delaware River is an ecologically, economically, and culturally important river system situated along the eastern coast of the United States. Nearly 15 million people rely on the basin's waters for drinking and industrial use, including those in New York City and Philadelphia. Three quarters of the non-tidal river is part of the National Wild and Scenic Rivers System, and the river is within a day's drive of 40% of the U.S. population, making the Delaware an important recreational resource for millions of people. Stream-water quality and the health of aquatic life in the basin have been strongly influenced by human activities, and the maintenance of biological diversity and ecological flows have become management priorities. To better assess the conservation status of aquatic ecosystems and individual species, an aquatic gap analysis is being conducted for the Delaware River basin.

Central to a gap analysis is the development of predictive species models to estimate biodiversity. The basin encompasses four states (Pennsylvania, New York, New Jersey, and Delaware), each of which survey, record, and maintain information regarding aquatic species occurrences. Multiple federal, non-governmental, and academic organizations also collect species occurrence information throughout the basin. These sampling records, books, atlases, and articles have provided occurrence information for 112 freshwater and diadromous fish species and 16 freshwater bivalve species for the years 1957 to 2006 and 1817 to 2007, respectively. The resulting occurrence databases serve as input into predictive models that associate species occurrences with stream segment habitat features derived from geographic information systems (GIS). Results of these predictive species models are combined to portray a more robust estimate of biodiversity. The gap analysis combines these biodiversity estimates with stewardship information for the basin to identify potential gaps in biodiversity conservation.

The resulting databases, spatial data layers, models, and analyses provide resource managers with the information needed to make those management decisions critical to ensuring the health and diversity of the Delaware River basin and its inhabitants.

KEYWORDS

collaboration, modeling, conservation, biodiversity, GIS