

Stream Conditions for Fish Have Improved Since the 1970s

Based on differences in the Index of Biotic Integrity (IBI), conditions for fish in streams of the Delaware, Passaic, and Raritan Basins have improved since the 1970s (table 1, Chang and others, 2000).

Of the 88 sites, stream condition:
 Improved at 46%,
 Worsened at 13%,
 Unchanged at 41%.

Reason for improvement:
 Improved treatment of wastewater discharges during the 1980s and to some extent, changes in land-use.

Urban nonpoint influences on impairment are still significant (fig. B below)

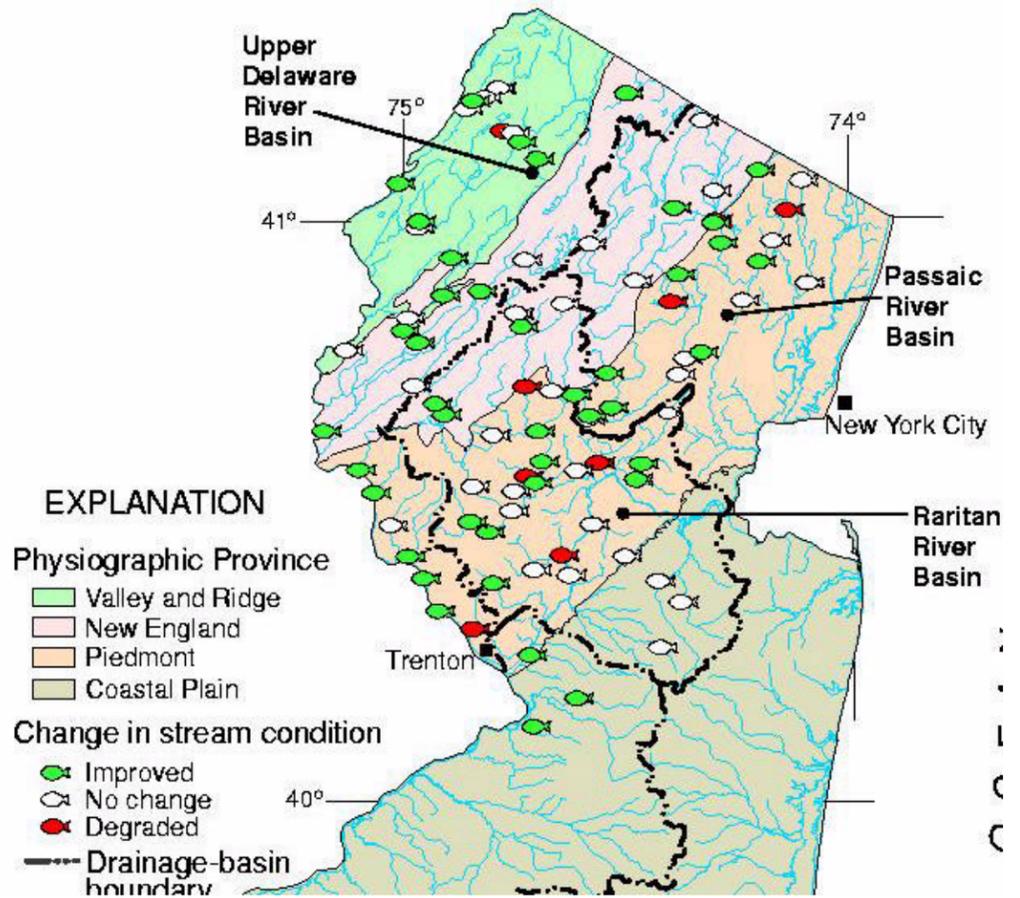


Table 1. Mean basin IBI scores for sampled streams of the Delaware, Passaic, and Raritan River Basins have increased significantly from the 1970s to the 1990s (Chang and others, 2000)

Index	Delaware(32 sites)		Passaic(24 sites)		Raritan(32 sites)	
	1970s	1990s	1970s	1990s	1970s	1990s
Mean Index of Biotic Integrity	34	40	30	35	33	36
Condition rating	fair	good	fair	fair	fair	fair

Index of Biotic Integrity (IBI)—Ten community measures (often called biometrics) based on the number of fish species, feeding habits, abundance, and health are used to evaluate the biological integrity of streams. A score of 1, 3, or 5 is assigned to each community measure on the basis of overall similarity to an appropriate regional reference site, 5 indicating most similar and 1 indicating least similar to reference conditions. Scores for individual community measures at each sampling location are then summed to produce a total score, which is assigned a condition category. The maximum score a site can receive is 50 and the minimum is 10. The four condition categories are excellent (44–50), good (37–43), fair (29–36), and poor (10–28) (Kurtenbach, 1993). The IBI serves as an integrated analysis because individual biological measures provide differing levels of sensitivity to changes in biological condition (Barbour and others, 1999).

NJDEP Ambient Biomonitoring Network (AMNET) is a statewide network of more than 800 aquatic-invertebrate sampling sites that was designed to monitor the condition of aquatic communities in 5 water-management areas on a 5-year rotational basis. This sampling frequency is considered to be realistic for evaluating long-term environmental change. Sampling locations (fig. 7), which were chosen in a stratified-random design to monitor all nontidal streams at approximately 3-mile intervals, include 43 reference (minimally disturbed) sites. Level of community impairment (non-impaired, moderately impaired, and severely impaired) is based on a modification of the USEPA Rapid Bioassessment Protocol II (Plafkin and others, 1989).