

Progress toward water quality improvement: Zooplankton. AMP 2011 Annual Report. (Assessment Measure)

AMENDED CONSENT JUDGMENT GOAL

Achieve abundance and species composition of a zooplankton community comparable to productive lakes in the geologic and climatic setting of Onondaga Lake.

Hypotheses to be tested:	Status:
Metro improvements and watershed phosphorus load reductions reduce the biomass of zooplankton by reducing the algal food supply in Onondaga Lake.	<ul style="list-style-type: none"> Data suggest that the biomass of zooplankton in Onondaga Lake is influenced more by alewife predation than by fluctuations in the algal food supply. In the aquatic environment, larger zooplankton are the most effective grazers of phytoplankton and exert a major control on the standing crop (Mills et al. 1987). Alewives graze on larger zooplankton; years with abundant alewives consistently exhibit the smallest zooplankton and lower water clarity than would be expected from phosphorus concentrations alone.
Current Conditions with Historical Comparison	
Community Biomass <i>(Annual average April-Oct (standard deviation))</i>	1999-2002: 297 ug/L (112 ug/L) 2003-2009: 227 ug/L (56 ug/L) 2010: 92 ug/L 2011: 60 ug/L
Daphnia Biomass <i>(Annual average (standard deviation))</i>	1998-2002 (before alewife abundant): 133 ug/L (55 ug/L) 2003-2007 (while alewife abundant): 18 ug/L (27 ug/L) 2008-2009 (alewife decline): 59 ug/L (8) 2010 (alewife abundant): 0.44 ug/L 2011 (alewife abundant): 0.67 ug/L
Forcing Functions	Food supply (algal abundance), species composition, grazing pressure (alewives), water quality (ammonia, chlorides)
Monitoring and Assessment Program	
Lake Monitoring <i>(Annual County monitoring program)</i>	Biweekly monitoring for density (organisms per ml) and biomass (ug/l), March – November/December Metrics to track over time: <ul style="list-style-type: none"> Average size in spring (June 1 – 15) and fall (Sept. 1 – 15) Relative biomass of major cladoceran types Relative biomass of major copepod types Number of crustacean taxa (1995 to present)
Tools for Decision Making	
Model	None developed. Zooplankton grazing rate will be specified in the Onondaga Lake Water Quality Model (under development by Anchor QEA,LLC)