

Long-term ecosystem monitoring and assessment of the Detroit River and Western Lake Erie

J. H. Hartig · M. A. Zarull · J. J. H. Ciborowski ·
J. E. Gannon · E. Wilke · G. Norwood ·
A. N. Vincent

Received: 13 May 2008 / Accepted: 11 September 2008
© Springer Science + Business Media B.V. 2008

Abstract Over 35 years of US and Canadian pollution prevention and control efforts have led to substantial improvements in environmental quality of the Detroit River and western Lake Erie. However, the available information also shows that much remains to be done. Improvements in environmental quality have resulted in significant ecological recovery, including increasing populations of bald eagles (*Haliaeetus leucocephalus*), peregrine falcons (*Falco columbarius*),

lake sturgeon (*Acipenser fulvescens*), lake whitefish (*Coregonus clupeaformis*), walleye (*Sander vitreus*), and burrowing mayflies (*Hexagenia spp.*). Although this recovery is remarkable, many challenges remain, including population growth, transportation expansion, and land use changes; nonpoint source pollution; toxic substances contamination; habitat loss and degradation; introduction of exotic species; and greenhouse gases and global warming. Research/monitoring must be sustained for effective management. Priority research and monitoring needs include: demonstrating and quantifying cause–effect relationships; establishing quantitative endpoints and desired future states; determining cumulative impacts and how indicators relate; improving modeling and prediction; prioritizing geographic areas for protection and restoration; and fostering long-term monitoring for adaptive management. Key management agencies, universities, and environmental and conservation organizations should pool resources and undertake comprehensive and integrative assessments of the health of the Detroit River and western Lake Erie at least every 5 years to practice adaptive management for long-term sustainability.

J. H. Hartig (✉) · G. Norwood
US Fish and Wildlife Service, Detroit River
International Wildlife Refuge, 9311 Groh Road,
Grosse Ile, MI 48138, USA
e-mail: john_hartig@fws.gov

M. A. Zarull
Water Science and Technology, Environment Canada,
Burlington, Ontario, Canada

J. J. H. Ciborowski · A. N. Vincent
Department of Biology, University of Windsor,
Windsor, Ontario, Canada

J. E. Gannon
Great Lakes Regional Office, International Joint
Commission, Windsor, Ontario, Canada

E. Wilke
Southwest Michigan Land Conservancy,
Portage, MI, USA

Keywords Detroit River · Western Lake Erie ·
Indicators · Trends · Ecosystem health ·
Assessment