

MIDWEST

The West Branch Wapsinonoc Creek, which flows through Herbert Hoover National Historic Site in West Branch, Iowa, overflowed its banks several times during 1993. On August 16, the tributary damaged NPS facilities and property in one last, severe flood. At NPS request, the Iowa District of the U.S. Geological Survey (USGS) Water Resources Division conducted a flood risk analysis for the tributary through the historic site.

The analysis confirmed park vulnerability to periodic flooding. On August 16, 1993, the worst day of flooding, the tributary flowed at a peak of 1,650 cfs (cubic feet per second), whereas the capacity of the tributary in the park is limited to 650 cfs. The reading corresponds to a flood frequency discharge of a 25- to 50- year event. Several structures are at risk of flooding, especially the maintenance building, which could be flooded as often as every 10 years. Fortunately, the main floor elevations of the Hoover Library and birthplace cottage are

above the 100-year flood elevations, although only by less than a foot.

This flood analysis demonstrates that the USGS is responsive to short-notice management needs for information that can be used in making informed management decisions. We hope that others will explore using their services in this capacity.

REFERENCE

Einhellig, P.E. 1994. Flood analysis, West Branch Wapsinonoc Creek tributary, Herbert Hoover National Historic Site, West Branch, Iowa. U.S. Geological Survey-Iowa District, Water Resources Division.

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Bald eagles symbolize not only the United States of America, but also American environmental quality. Researchers recently developed a protocol for using the bald eagle as a Great Lakes air quality indicator species (Bowerman et al.). The Great Lakes Protection Fund provided grants to develop a protocol through two coordinated research and management studies: a broad, Great Lakes Basin study, and an intensive, localized study of northern Wisconsin.

The basinwide project assessed habitat quality, the role of environmental contaminants, and population dynamics of nesting bald eagles across the Great Lakes Basin. Researchers determined that bald eagles build nests primarily in white pines, except around Lake Erie where they use cottonwoods. Although potential nesting habitat exists along the shorelines of all the Great Lakes, it primarily exists along lakes Huron and Superior. Habitat availability, however, may limit the Lake Erie subpopulation, which has little unoccupied habitat and a high density of nesting eagles. Concentrations of p,p'-DDE or PCBs (polychlorinated biphenyls), but not mercury or sele-

nium, were significantly (and inversely) correlated with regional reproduction and success rates. Concentrations of organochlorine compounds primarily regulate bald eagle reproduction levels along Great Lakes shorelines, whereas bird density-dependent factors regulate productivity in the relatively uncontaminated interior areas.

The intensive local study in northern Wisconsin assessed the role of food availability, weather, and contaminants on bald eagle productivity. Bald eagles nesting on the Lake Superior shoreline in Wisconsin experience significantly lower reproductive rates than those nesting more than 8 km (4.9 mi) *inland* from the Wisconsin lakeshore. The weight of evidence suggests that the most likely cause of lesser productivity on the Wisconsin Lake Superior shoreline is low food availability, with greatest effects measured in bald eagle pairs with two young; however, DDE remains a possible contributing factor.

The bald eagle biosentinel protocol appears to have great utility for organizations that wish to monitor ecosystem components, such as water quality. The state of Michigan has formally adopted the protocol to assess Great Lakes water quality. Later this year, the National Park Service and other federal agencies may adopt the protocol, too.

REFERENCE

- Bowerman, W.W., M.W. Meyer, and J.P. Giesy. 1994. Use of bald eagles as ecosystem monitors of Great Lakes water quality: development of a biosentinel protocol. A companion report to Great Lakes Protection Fund Final Reports for Grants # RE792-3092-1 and # RE792-3092-2.