

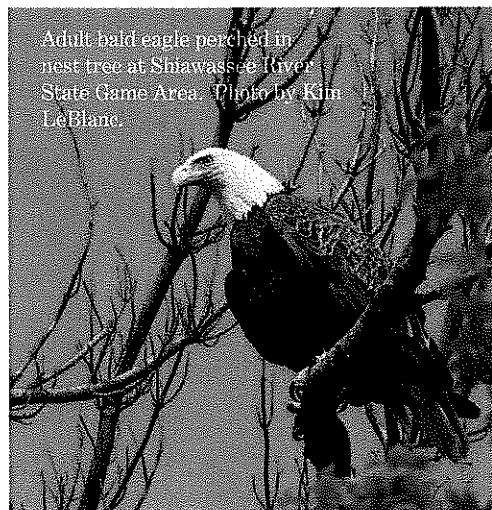
Earlier Nesting Behavior in Bald Eagles Along Michigan's Shorelines and Large Rivers

For the past two decades, bald eagles along Michigan's shorelines and rivers have been nesting earlier in the season than ever before. More than a half-century of bald eagle research in Michigan has brought this trend to light. A soaring bald eagle sighted over Michigan skies paints a portrait of conservation success. This premature nesting trend, however, may be a possible response to changes in climate in the upper Midwest for this iconic species.

Dave Best, fish and wildlife biologist at the U.S. Fish and Wildlife Service's East Lansing Ecological Services Field Office, and Bill Bowerman at Clemson University have been studying bald eagles as indicators of water quality in the Great Lakes watershed of Michigan. In the early 1960s bald eagles were restricted to remote portions of Michigan's rugged Upper Peninsula near Wisconsin and northern portions of Michigan's Lower Peninsula near hydroelectric reservoirs with stable water levels.

Researchers grew in their capacity to determine age and sex of a bird via head and foot measurements, and to measure contaminant exposure via blood draws and breast feather analysis. Today, eagle research spans across state and federal agencies and academic institutions. The key players are Clemson University, Michigan Department of Natural Resources, and the U.S. Fish and Wildlife Service. The results of this partnership effort are more

than 50 years of data on nesting, behavior, productivity, survivability and overall population dynamics for bald eagles in Michigan. In 1965, when Postupalsky first started banding eagles, nestlings were able to be banded in mid-



June in the northern Lower Peninsula. In the past few years, we start banding at the start of May, almost a six week change in nesting chronology," Bowerman said.

In 1988, we began to use a new method that used feather measurements to age nestlings. This method allowed us to determine that from 1988 – 2006, eagles nesting along the Great Lakes shorelines initiated egg laying an average of 0.7 days earlier each year, while those pairs nesting along large rivers open to **anadromous** fish, laid eggs 0.9 days earlier each year. These are the largest rates of earlier initiation of egg laying by birds recorded to date. Analysis of data from eagles inhabiting Michigan's interior, however, showed insignificant

changes in nesting behavior. "While the numbers may seem small at first glance when you compare two consecutive years, this long term data from more than 2,300 nest records shows that eagles nesting along the Great Lakes and along large rivers in Michigan are laying eggs up to two weeks earlier on average in present day compared to 19 years ago," Best said.

"It is believed that the reduced duration and extent of ice cover on the Great Lakes due to climate change has led to earlier access to foraging areas along the lakes, which has triggered earlier initiation of egg laying by nesting eagles," Best said. "Earlier nesting has not yet resulted in any change in productivity suggesting that the eagles so far have adjusted to climate change." Long term nesting and productivity data are available for a select few sea eagle species from other parts of the globe in Sweden, Russia and Africa. These data sets from sister species like the African fish eagle and Stellar's sea eagle will be evaluated to determine if there are similar trends in nesting behavior.

"The data collected in Michigan is some of the most long-term, unique data for a bird species," Best said. "Working with our federal, state and academic partners, it helps us as conservationists and wildlife managers analyze past, present and potential threats to native, iconic species like the bald eagle, and thus work to conserve and protect them in a changing climate."

--Ashley Spratt, *External Affairs*