NORTHERN ILLINOIS UNIVERSITY

LONG-TERM TRENDS OF TEMPORAL VARIATION OF COLOR PATTERN, BODY SIZE, CONDITION, AND GROWTH RATE OF THE THREATENED LAKE ERIE WATERSNAKE

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ABSTRACT

The United States federally threatened Lake Erie watersnake (*Nerodia sipedon insularum*) has a range restricted to islands in Western Lake Erie. This subspecies differs from the northern watersnake (*Nerodia sipedon sipedon*) in exhibiting a reduction in color pattern. *N. S. insularum* often lacks dorsal and lateral bands present in *N. s. sipedon*. When banding is present, it is reduced and/or lighter in color. Evaluation of the geographic scale of color pattern variation in N. s. insularum showed no significant differences between sites within islands, but did show significant differences among islands or island groups. Twenty-four years of current data (1980 – 2003) allowed for analysis of temporal trends in color pattern. Temporal variation in color pattern was statistically significant, but overall it appeared that the population is currently in selection-gene flow equilibrium.

This sexually dimorphic snake also showed a temporal increase in maximum body size and temporal variation in condition (a size-independent measure of mass) in both males and females. However, annual weather conditions, including summer and winter length and average temperature, could not explain year-to-year variation in either trait. The introduction of the round goby (*Neogobius melanostomus*), which has become a primary food source for *N. s. insularum*, does appear to correlate with changes in body size. Comparisons of samples from before and after the introduction of *N. melanostomus* showed that body size distributions were shifted upward for both adults and neonates and that adult growth rates were increased. These increases in size and growth rate may help conserve this threatened snake.