

USING STABLE ISOTOPES TO ASSESS VARIABILITY IN FIDELITY OF GRASSLAND BIRDS ON NATIONAL PARK SERVICE UNITS IN THE GREAT PLAINS

SARAH E. REHME, SCHOOL OF NATURAL RESOURCES, 3310 HOLDREGE STREET, UNIVERSITY OF NEBRASKA-LINCOLN, LINCOLN, NE 68583-0961

LARKIN A. POWELL*, SCHOOL OF NATURAL RESOURCES, 3310 HOLDREGE STREET, UNIVERSITY OF NEBRASKA-LINCOLN, LINCOLN, NE 68583-0974

CRAIG R. ALLEN, NEBRASKA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT, 3310 HOLDREGE STREET, UNIVERSITY OF NEBRASKA-LINCOLN, LINCOLN, NE 68583-0984

KEITH A. HOBSON, ENVIRONMENT CANADA, 11 INNOVATION BLVD. SASKATOON, SK, CANADA, S7N 3H5

Abstract: Assessing the potential of National Parks to sustain songbird populations is not an easy task. Traditional surveys provide annual information about species' use, but no information about reproductive success or fidelity of adults to the area. Finding and monitoring nests is a difficult and labor intensive task, as is banding birds to assess fidelity with recaptures. We proposed to evaluate an emerging method, stable isotope analyses of avian tissues. Stable isotope analyses may allow biologists to efficiently gauge the importance of grassland habitat patches to regional productivity. Stable isotope analyses take advantage of regional gradients in ratios of isotopes in precipitation and/or vegetation (e.g., $^1\text{H}:$ ^2H , $^{13}\text{C}:$ ^{12}C), that are expressed in the tissues of birds from a given location. We gathered tissue samples on three National Park Service properties: Pipestone National Monument (Minnesota), Homestead National Monument (Nebraska), and Tallgrass Prairie National Preserve (Kansas). We collected feathers and blood from adults and nestlings. Our initial analyses show, as expected, a narrow range of isotope responses from nestling feathers and blood, as these tissues were known to be produced from the diet at the parks. However, adult feathers had a larger range of response values, indicating that a portion of our sample of birds had immigrated to the park. Parks with high rates of immigration have higher turnover, which may indicate lower quality breeding habitat. Our method has potential to provide information about regional fidelity of birds, and this information could be useful to managers as they make decisions about grassland management on park properties.