PREDICTING HABITAT SUITABILITY FOR LESSER SCAUP (Aythya affinis) SPRING MIGRANTS IN EASTERN SOUTH DAKOTA

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ABSTRACT

Recent population declines of lesser scaup (Aythya affinis; hereafter scaup) have led scientists to hypothesize that habitat declines along spring migration routes may be contributing to arrival condition on breeding grounds. We used site-specific and landscape scale data collected from 2004 to 2006 to determine the variables that best described and predicted wetland use by scaup. Our results show that the availability and abundance of their preferred prey items, amphipods (Hyalella azteca and Gammarus lacustris) is more important than wetland size or depth, therefore scaup are more likely to select wetlands with high prey densities to optimize foraging efficiency. A predictive model developed using model averaged parameter estimates for submerged aquatic vegetation and amphipod abundance to predict scaup use performed well, explaining 64% of the variation in scaup use. Long-term amphipod data collection revealed that amphipod abundance in the spring was best explained by spring water depths ($F_{1,4} = 11.3$, $P = 0.02$). At the landscape scale, total wetland area and total shoreline length within 3000 m as well as high density development within 100 m of a site best described scaup use. By incorporating the effects of average monthly temperature and precipitation on site-specific and landscape scale habitat characteristics we were able to develop a temporally dynamic habitat suitability index model to determine the effects of climate change on availability of habitat for scaup spring migrants. Preliminary results indicate that changes in the local summer temperature and winter precipitation have led to declines in habitat suitability for amphipod which may in turn limit nutrient acquisition by scaup during the critical pre-nuptial migration period.