



Site preferences and participation of waterbird recreationists: Using choice modelling to inform habitat management



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ABSTRACT

Recreationists utilizing wetland birds for hunting or birdwatching contribute significantly to local economies and conservation efforts. The waterfowl management community, through the 2012 North American Waterfowl Management Plan (NAWMP), has explicitly recognized the need to increase recruitment and retention of wetland bird recreationists to help halt the national decline in social support for conservation. Achieving this goal requires that waterfowl and wetland managers consider how recreation site characteristics and management impact participation and support for wetland conservation. The outdoor recreation management and natural resource economics fields have extensive experience with similar problems and frequently use recreational site choice models to link attributes of recreational areas to use by recreationists. The waterfowl management community has several publicly available, long-term data sets that can be used in site choice models. We introduce U.S. Fish and Wildlife Service waterfowl harvest survey data, U.S. Geological Survey band encounter data, and Cornell Lab of Ornithology eBird data and use those data to summarize travel characteristics of wetland bird enthusiasts. We used harvest survey and eBird data in choice models to predict and compare the impacts of three seemingly similar proposed habitat acquisitions on use by recreationists in the state of Georgia; the proposal that had the greatest increase in predicted trips would result in twice as many additional hunting trips and > 10 times more additional birdwatching trips than the proposal that generated the fewest additional trips. This case study demonstrates the potential of these and similar data and analytical methods for incorporating recreation participation and site preferences into habitat planning and delivery under the NAWMP. We encourage the outdoor recreation management and economics communities and the waterfowl management community to build partnerships and cooperative projects to improve our understanding of the relationships between wetland bird users and habitat conservation.

Management implications:

- Results from our site choice models can provide a natural and intuitive metric that can be used to evaluate the relative merits of alternative management actions in achieving social objectives. An improvement over current proposals evaluated on a qualitative description of public access might be achieved through using the choice modeling approach to obtain quantitative estimates of the expected increase in public use resulting from a proposal.
- Future research efforts that utilize finer resolution recreation site choice information would allow for a better understanding of recreationists' decision processes and could provide managers with valuable insights into the benefits of quality improvements at state parks, managed areas, and other management units of interest.
- Researchers should also work with state agencies to identify sources of finer resolution site characteristic data, such as the distribution and availability of public land, recreational regulations, and presence of infrastructure.
- Researchers should explore interdisciplinary collaborations with ecological modelers to model expected sightings or expected harvest as a function of spatially-explicit environmental and landscape characteristics. Such a model could then be linked to a recreation site choice model, allowing the tracing of wetland restoration/enhancement benefits through a change in the biological system, and ultimately the change in trip locations, total trips, and/or economic benefits.
- We encourage the natural resource management and economics professionals to build partnerships and cooperative projects with the NAWMP community to improve our understanding of the preferences,

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participation, and motivation of wetland bird users and their relationships to habitat conservation and management.

1. Introduction

Waterfowl hunters and birdwatchers in the United States are avid outdoor recreationists whose avocations contribute significantly to local economies and the outdoor equipment and supplies industry. In 2011, some 1.5 million waterfowl hunters devoted about 17 million days to hunting ducks and geese, spending > \$1.3 billion on trip expenses and equipment (Carver, 2015). In addition, about 47 million birdwatchers, 38% of whom took trips away from home to view birds, contributed ≥ \$40.9 billion to the national economy in 2011, supporting 666,000 jobs resulting in ≥ \$31.3 billion of employment income (Carver, 2013). Importantly, waterfowl hunters provide critical funding for on-going conservation efforts such as habitat acquisition and research through their purchase of federal and state migratory bird

hunting licenses and taxes and duties levied on hunting equipment including firearms and ammunition (Cooper, Larson, Dayer, Stedman, & Decker, 2015; Grado, Hunt, Hutt, Santos, & Kaminski, 2011). For example, since 1934, the purchase of federal migratory hunting and conservation stamps has generated \$800 million dollars used to conserve ≥ 6.5 million acres of habitat (U.S. Fish and Wildlife Service, 2015). Both birdwatchers and waterfowl hunters contribute to non-government conservation organizations and both groups actively advocate for policies and programs that benefit birds and their habitats (Cooper et al., 2015; Kerlinger, 1993). Recently there has been increasing concern among wildlife conservation professionals that the decline in hunter numbers and increasing proportion of Americans classified as ‘non-nature-based recreationists’ will have a negative influence on operating budgets and public support with consequences

Fig. 1. Map of North American Migratory Bird Habitat Joint Ventures recognized by the North American Waterfowl Management Plan.



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