IMPACTS OF HUMAN DISTURBANCE ON MIGRATORY WATERFOWL

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Introduction

Human disturbances can either alter the physical environment or cause changes in an animal's behavior. The response to human disturbance is at times similar to how animals respond to risk of predation. For waterfowl, hens rely on stored lipids as energy to forage for the protein food sources required for egg production. If humans disrupt a bird it will expend energy avoiding the disturbance, spend less time feeding or resting, and will likely be forced to move to an area of worse habitat.

Outdoor recreational activities which include hiking, boating, camping, and wildlife observation are becoming increasingly popular but can disturb wildlife by altering their normal behavior (Boyle and Samson 1985). When different animal species are exposed to a human presence, their natural habits may be altered. This may negatively affect an organism in areas such as feeding habits, courtship, or raising young (Ciuti et al. 2012). Typically, all human activities can impact wildlife populations in either a positive or a negative way.

Human disturbances can be classified as either altering the physical environment or causing changes in an animal's behavior. The non-consumptive human activities that cause a change in an animal's behavior are not as well understood. Human disturbances can cause birds to expend valuable energy during migration. If humans disrupt a bird it will expend energy avoiding the disturbance, spend less time feeding or resting, and will likely be forced to move to an area of worse habitat (Pease et al. 2005).

http://www.wildlife.state.nh.us/Hunting/Hunt_species/hunt_waterfowl.htm

Methods and Materials

We measured responses of waterfowl to human disturbance during November – December 2013 at McPherson Valley Wetlands, McPherson, KS. The study was conducted at McPherson Valley Wetlands, located in McPherson County, which lies in central Kansas. The wetlands are used primarily for waterfowl hunting during the season and for recreational wildlife viewing the rest of the year. Kansas lies within the central flyway of North America and although Cheyenne Bottoms and Quivira National Wildlife Refuge are used extensively by migrating birds this area in central Kansas is also used on a regular basis as a common stopover for migrating birds. This wetland area that features both refuge and hunted areas provides a great opportunity to study and compare the migrating waterfowl in the area.

Tests were administered on 8 separate test locations within the wetlands (4 refuge marshes and 4 hunted marshes). For any species of waterfowl present, we recorded the minimum distance at which the birds took flight, the amount of time the birds spent in flight and if they caused any secondary flushing of the surrounding birds when they left the wetland. The birds were monitored for a minimum of 5 minutes before a disturbance was created to ensure the birds were responding to the human disturbance. Bird responses that were recorded included the following: changing behavior and avoiding the disturbance without taking flight, and avoiding the disturbance by taking flight. In order for a bird to be categorized as avoiding the disturbance it must move away from the disturbance a minimum of 20 yards. If the bird takes flight it must remain in the air a minimum of 10 seconds to be categorized as fleeing the scene of the disturbance.

Results

We found a slight relationship between group size and minimum flush distance from the disturbance ($r^2 = 0.56$) but no relationship between group size and flight time. On average, the minimum distance before the waterfowl took flight when approached was 96.5 m. For waterfowl that took flight, 46% of the groups caused a secondary flush after being disturbed. The average secondary flush consisted of approximately 19.5 birds.

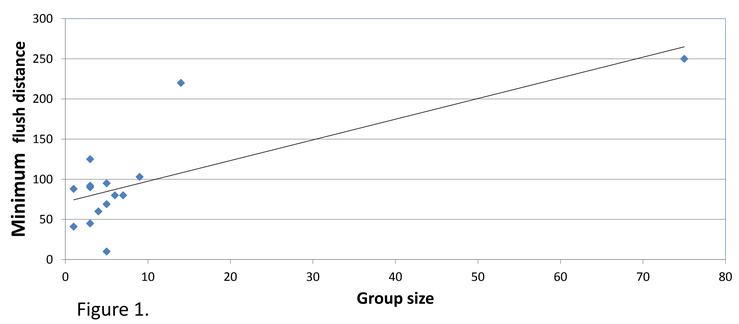

Figure 1.

http://www.ducks.org/kansas/kansas-projects/mcpherson-valley-wildlife-area

Discussion

Since I was only able to conduct field research twice, once in November and once in December, further data may be needed to accurately reflect the responses of waterfowl to human disturbance. Because only fifteen different groups of birds were observed, the current sample size is to small to draw sound conclusions.

This being said, my findings may be among the first studies to report the secondary flush caused by waterfowl as they respond to human disturbance. This may prove important to study further as a flush of 10 birds may end up causing a disruption of 20 or more birds on the marsh. I also compared the disturbance of waterfowl on hunted marshes vs. refuge marshes and again due to the small sample size could not test for any definite difference between the two. However, more tests comparing hunted vs. non-hunted marshes may also prove to be useful for conservation planning.

Conclusions

Even non-consumptive recreational activities, such as bird-watching or pedestrian traffic, may cause waterfowl to expend excess energy that could potentially be important for nest success. Even though these activities typically only cause short-term disruptions, they may collectively effect waterfowl populations because of increased energetic stresses, displacement from preferred environments and changes in activity budgets. If energy expended by waterfowl in response to human disturbance does prove to impact reproductive success, findings from this study would be useful for limiting human activity to a distance that will minimize negative responses by waterfowl.

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