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Lois Webster Fund 2015 Final Report

Project Description and Background: Habitat Use by Mountain Plover During Nest Incubation

Over the last 150 years, grasslands of the Great Plains have undergone many changes, including conversion to agriculture and loss of native grazers (e.g. bison). This has, in part, led to the decline of numerous grassland-endemic birds. The Mountain Plover (*Charadrius montanus*) is a species of conservation concern in both Colorado and Nebraska, and is native to the short-grass prairie. Currently, plovers breeding in northern Colorado and southwestern Nebraska are presented with a mosaic of habitat cover-types for nesting. This landscape, mostly privately owned, consists of a mix of agricultural fields, rangeland and land enrolled in the Conservation Reserve Program. My research in collaboration with Bird Conservancy of the Rockies is investigating how Mountain Plover make use of this modern landscape during the breeding season. The study area consists of private land in Kimball County, Nebraska and Weld County, Colorado.

Previous research of habitat use by Mountain Plover has focused on the post-hatch period; when adults are moving around the landscape with broods. My research focuses on tracking adults during the nest-incubation period. Adult home-range size during this time period is unknown, and may be different than home-range size estimates based on when adult plovers are raising broods. Incubating adults are not tethered to their brood, and thus may have opportunity to travel farther than adults with broods. Additionally, Mountain Plover use a split-clutch mating system, in which the 6-egg clutch is split between two nests concurrently incubated by each adult. Unlike most incubating birds, Mountain Plover do not benefit from mate-feeding and must balance their foraging requirements with their nest attendance duties. We are particularly interested in where the adult plovers are foraging. Do adults nesting on agricultural fields forage there as well, or do they travel to nearby rangeland that consists of mostly native short-grass prairie? If Plovers nesting on agricultural fields are not also foraging there, it could represent an energetic cost associated with nesting on this human-created landscape.

This report will summarize our findings from the 2015 field season, including analyses of home-range size as well as habitat preference within these home-ranges.

2015 Field Season

We started the season with 7 gps-tags, 3 of which were purchased through funding received through the Lois Webster Fund. These tags were deployed on nesting adult plovers for periods of about a week before re-trapping the plover and retrieving the tag and data. Using these tags, we were able to collect spatial data from 6 nesting plovers (See figure 1 for a gps-tagged plover). These data are presented below along with data from the 2014 field season. We found and monitored 48 nests, nearly all in Kimball County though we did gain access to one nest on Pawnee National Grassland in Weld County. We banded 30 plovers with unique color-band combinations and saw 5 banded plovers return from previous years. Our overall number of nests found was down slightly from previous years, mainly due to rainy conditions limiting our field time in the early breeding season.

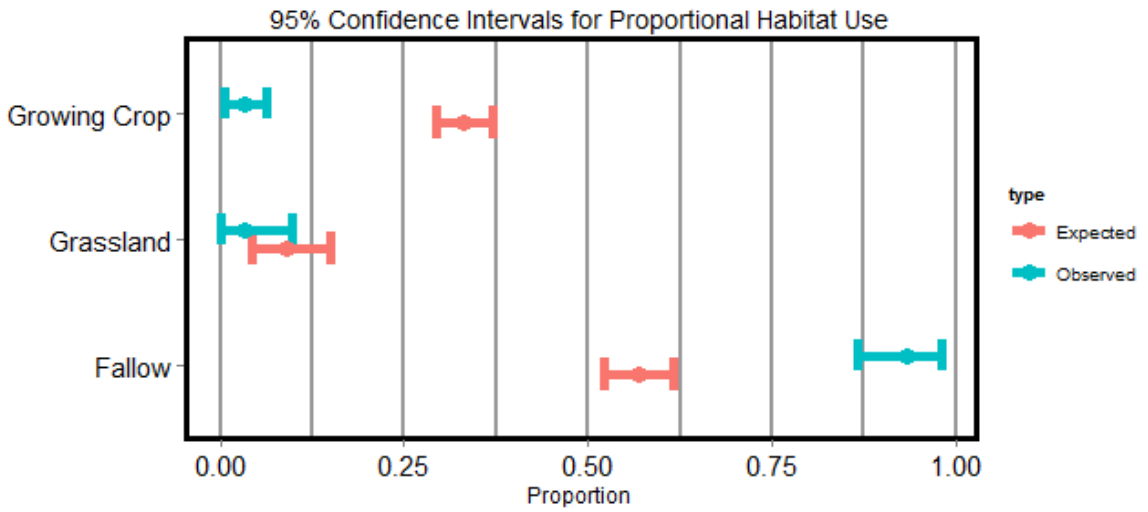
Figure 1: Adult Mountain Plover with attached GPS-tag

Results

To estimate home-range size during nest incubation, we used the fixed-kernel method with least squares cross validation to determine the smoothing parameter. Home-ranges are based on a 95% contour of the kernel density. Figure 2 shows a home-range map constructed from GPS-tag data points.

Figure 2: Home range during incubation for an individual Mountain Plover

Home-range size during nest incubation was 155.4 hectares ± 55 SE. This is very similar to previously published home-range sizes during the brood-rearing period (see Dreitz et al. 2005). We also mapped the vegetation cover near each nest and used these data with the GPS-tag data to estimate plover habitat preference. We used the habitat cover type at observed locations for each tagged bird and compared it to what we would expect if the plover was using the surrounding area randomly. We classified habitat types as fallow (including stubble fields), growing crop, or grassland (including rangeland and Conservation Reserve Program land). Figure 3 shows the results with 95% confidence intervals for observed (from GPS-tags) and expected proportional use within each habitat type. The plovers showed a strong preference for using fallow land, with the observed use about 35% higher in fallow fields than what random use would dictate. Plovers rarely used grassland or growing crop.



The mean distance from the nest for foraging plovers was 385 meters ± 26.4 SE. In combination with the proportional habitat use, this suggests that plovers typically do not forage far from their nests and tend to stay on fallow fields. We didn't find evidence of a preference for grassland habitat.

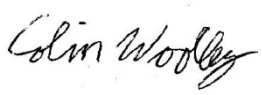
Future research

I am currently processing invertebrate prey samples from habitat types in the study area. I will use these samples to estimate and compare abundance and energy content of plover food resources within each habitat type. Preliminary data suggest there is little if any difference in food availability in fallow fields vs. grasslands.

I would like to thank the Lois Webster Fund for supporting this research on Mountain Plovers. This research also would not be possible without collaboration from Bird Conservancy

of the Rockies, Nebraska Game and Parks Commission, Nebraska Environmental Trust, and Colorado Field Ornithologists. I look forward to completing my research and presenting my findings to the scientific community and the general public via both publications and presentations.

Thank you again,



Works Cited

Dreitz VJ, Wunder MB, and Knopf FL, 2005. Movements and home ranges of mountain plovers raising broods in three Colorado landscapes. *The Wilson Bulletin.* Vol 117 (2), pp 128-132.