Movements of Mountain Plovers within and between breeding season

Paul Daniel Blom Skrade
Iowa State University, skradepa@gmail.com

Stephen J. Dinsmore
Iowa State University, cootjr@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/nrem_conf

Part of the Natural Resources Management and Policy Commons, and the Ornithology Commons

Recommended Citation
http://lib.dr.iastate.edu/nrem_conf/1

This Presentation is brought to you for free and open access by the Natural Resource Ecology and Management at Iowa State University Digital Repository. It has been accepted for inclusion in Natural Resource Ecology and Management Conference Papers, Posters and Presentations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Movements of Mountain Plovers within and between breeding season

Abstract
The Mountain Plover breeds on Black-tailed Prairie Dog (Cynomys ludovicianus) colonies in Phillips Co., Montana. They have an unusual mating system that raises questions about sex-specific movements within and between breeding seasons as they relate to nest fate. We studied nesting plovers from 1995 - 2006, determined the fate of >1300 nests, and examined movements of plovers that nested in successive years. A total of 48 plovers moved within years and another 166 moved between years. Within years, mean distance moved was 5.35 km (SD = 9.86) for females and 7.08 km (SD = 12.69) for males and did not differ (t = -0.53, P = 0.60). Between years, mean distance moved was 4.54 km (SD = 8.53) for females and 2.13 km (SD = 5.05) for males and differed (t = -3.07, P < 0.01). By fate, unsuccessful nesters moved farther than successful nesters the next breeding season (t = 2.92, P < 0.01). These results provide insight into the relationship between nest fate and fidelity and relate these to gender in a species with unusual parental roles.

Disciplines
Natural Resources Management and Policy | Ornithology

This presentation is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/nrem_conf/1
Movements of Mountain Plovers within and between breeding seasons

Paul D. B. Skrade
and Stephen J. Dinsmore
Theories of Dispersal

• Theories for dispersal and site fidelity (Greenwood 1980)
  – Low Individual Quality
  – Renesting Stress
  – Prior Experience Hypothesis
    • “Decision Rule”
    • High reproductive success
    • Higher prob. of return

• Dispersal and fidelity of sexes
  – Differing parental roles
  – Territory establishment
Mountain Plover Biology

- Uncommon and local shorebird of Great Plains and Great Basin
- Breeds in disturbed habitats
  - Black-tailed Prairie Dog (BTPD) colonies
  - Burns, hardpan flats
- Rapid multi-clutch system
- Territory roles of each sex

Charadrius montanus
Study Objectives

• Our objectives were to:
  – Quantify distances between successive nests of plovers within and between years
  – Understand how movements were affected by fate and sex of the tending adult
Study Area

- 3000 km² area in Phillips Co., MT
- Mixed-grass prairie interspersed with BTPD colonies
- ~35 BTPD colonies have plover nests each year
Data Collection

- Study period 1995 to 2006
- Searched all active prairie dog colonies for nests every year
- Recorded GPS coordinates for each nest
- Individually marked adults and later chicks
- Determined fate of nest
- Determined gender of tending adult
Methods - GIS

- Used successive nesting attempts within a year and in consecutive years
- Measured linear distance between nests
Analyses

• Calculated mean (±SE) distance moved
• Log transformed distances to meet assumptions of normality
• Tested for differences between mean distances moved using a paired t-test (α = 0.05)
  – Compared:
    • Fates between years
    • Sexes between years
    • Sexes within years
# Results

<table>
<thead>
<tr>
<th>Time</th>
<th>Test</th>
<th>N</th>
<th>km dispersed (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between years</td>
<td>Hatch</td>
<td>134</td>
<td>3.24 (0.60)</td>
</tr>
<tr>
<td></td>
<td>Fail</td>
<td>39</td>
<td>4.31 (1.20)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>95</td>
<td>2.12 (0.51)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>80</td>
<td>4.92 (1.06)</td>
</tr>
<tr>
<td>Within years</td>
<td>Male</td>
<td>23</td>
<td>6.92 (2.55)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>32</td>
<td>6.72 (1.70)</td>
</tr>
</tbody>
</table>
Results

Between years by fate

$P = 0.01$

Distance Moved (km)

# Individuals

FAIL

HATCH

0-5  6-10  11-15  >15
Results

Between years by sex

$P < 0.01$

# Individuals

Distance Moved (km)

0-5
6-10
11-15
>15

MALE
FEMALE
Results

Within years by sex

\[ P = 0.13 \]
Discussion

- Results of comparing fate between years provides support for the “Decision Rule” theory of the Prior Experience Hypothesis.
- Sex differences in breeding dispersal between years:
  - Males are more site faithful.
- Within years no significant difference between sexes:
  - Habitat saturation?
- Movement also affected by:
  - Habitat quality
  - Age
- How did decision impact nest success?
Study Implications

- Better understanding of strategies behind their dispersal and site fidelity
- Aid conservation planning decisions
- May provide insight into effects of sylvatic plague on their movements and colonization potential
Acknowledgements

• Funding provided by:
  Iowa State University
  BLM, Phillips Resource Area
  Montana Fish, Wildlife, and Parks

• We also thank:
  – J. J. Grensten
  – Charles M. Russell NWR staff
Questions?