Detection Probability and Disturbance of Waterfowl During Aerial Surveys

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Introduction

Aerial surveys of waterfowl have been conducted in the Illinois and Mississippi River floodplains since 1948. These traditional surveys provide an index of waterfowl population size rather than actual population size. New methods are being tested to determine actual population sizes in the survey areas. To estimate waterfowl populations, it is now crucial that aerial counts are accurate.

Methods

Double sampling was used to determine a correction factor. Immediately before an aerial survey, a ground observer counted all waterbirds within a discrete area. Aerial estimates were divided by ground counts to calculate a detection rate.

Observers also documented disturbance to waterfowl by counting the number of each species that were:

A) Disturbed: Exhibited a noticeable response to the airplane, or

B) Abandoned: Vacated the survey area completely and did not immediately return.

Average Detection

<table>
<thead>
<tr>
<th>Waterbird</th>
<th>Dabblers</th>
<th>Divers</th>
<th>Mergansers</th>
<th>Geese</th>
<th>Swans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>105.9%</td>
<td>74.8%</td>
<td>53.3%</td>
<td>92.4%</td>
<td>91.5%</td>
</tr>
</tbody>
</table>

Average Detection Rates by Number of Waterfowl Species

Average Detection Rates by Size of Waterbird Group

Disturbance

<table>
<thead>
<tr>
<th>Waterbird</th>
<th>Swans</th>
<th>Geese</th>
<th>Mergansers</th>
<th>Divers</th>
<th>Dabblers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>1.2%</td>
<td>28.6%</td>
<td>12.0%</td>
<td>4.5%</td>
<td>11.9%</td>
</tr>
</tbody>
</table>

Average Disturbance Rates of All Waterfowl

Average Disturbance Rates by Size of Waterbird Group

- Higher disturbance rates of waterfowl on refuges compared to non-refuge areas.
- Ducks and Canada geese show higher rates of disturbance in smaller groups, while light geese show higher rates of disturbance in larger groups.

Abandonment

<table>
<thead>
<tr>
<th>Waterbird</th>
<th>Swans</th>
<th>Geese</th>
<th>Mergansers</th>
<th>Divers</th>
<th>Dabblers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abandoned</td>
<td>0%</td>
<td>15.1%</td>
<td>4.3%</td>
<td>0.7%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

- Waterfowl numbers were overestimated when there were many species present.
- Waterfowl numbers were overestimated when group size was very large.