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TRUMPETER SWAN PRODUCTIVITY IN
GRAND TETON NATIONAL PARK, WYOMING

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This is a report of some of my activities carried out during the
summers of 1974 through 1976 in Grand Teton National Park, which were
associated with field work in the gathering of materials for a book on
the ecology and behavior of sandhill cranes and trumpeter swans in the
park. Only one month (May 22 to June 22) was spent in the park during
1976, and thus no data on swan productivity were obtained in that year.
Data on the park's swan production for the years prior to 1974 were ob­tained from the card files of the National Park Service and have been
organized in such a way as to make them comparable to similar data by
J. Halladay from Yellowstone National Park (Proceedings of the Third
Trumpeter Swan Society Conference, 1973), and published data from Red
and from Alaska (Wildlife Monographs No. 26, 1971), and R. Page's un­
published data from Red Rock Lakes (Ph.D. dissertation, University of
Montana, 1974).

Observations

Habitats Used by Breeding Swans

During the years since 1970, eight areas have been used successfully
for breeding by swans in or immediately adjacent to Grand Teton National
Park, as shown in Table 1. Of these, the Christian Pond location has been
most regularly successful, and indeed has been utilized by swans on a
yearly or nearly yearly basis since at least as early as 1957 (see summary
in 1975 Annual Report). Presumably the same pair has been present all this
time; if so, the birds have been nesting there for 20 years or more. This pair
has also been the most successful of those nesting in the park, at least
in recent years. The pairs at Pinto Ranch and Sawmill Pond have also been
relatively successful; the Sawmill Pond pair has nested there since at
least as long ago as 1964, but in 1976 did not appear. Likewise the pair
that nested on Cygnet Pond in the 1960's no longer does so, but a pair is
sometimes still seen using that area. The pair using Hedrick Pond has not
nested there since 1973; the male of that pair was killed by a poacher in
1974. The sizes of the areas used for nesting in the park varies consid­
erably, and averages slightly more than 30 acres, or very close to the
average territorial size reported for Red Rock Lakes birds.
Breeding Success

Data for the Park from the period 1969 through 1974 indicated that about seven territorial pairs were present during that period, and that about half of these raised one or more cygnets to late summer (Table 2). The number of cygnets raised per successful brood was, however, relatively low (2.14 average), which is comparable to data reported by Page for Red Rock Lakes in recent years. Cause of this substantial brood mortality is still extremely uncertain, but it is appreciably greater than that reported for the Alaskan population. One possibly contributing factor for the loss of young, which seems to occur very shortly after hatching, is the frequent periods of sub-freezing weather as late as mid-June, when hatching normally occurs. The possible influence of dietary factors in the survival of cygnets is unknown, but few if any cygnets are likely to be lost to predation in the park.

A similar estimate of breeding success can be obtained by determining an adult:cygnet ratio in late summer, as shown in Table 3 for Grand Teton National Park during the 12 years between 1960 and 1974 for which such data were available in Park files. The resulting ratio of 3:15 adults per cygnet is a relatively favorable one by comparison with Halliday's reported figures for Yellowstone National Park during a similar period and with Banko's data from Red Rock Lakes National Wildlife Refuge for the year 1954, when population levels of swans at the refuge were at their maximum. Obviously these ratios reflect not only breeding success of nesting birds, but also the incidence of non-nesting by adults and the presence of sub-adult birds in the population.

Summary

The Grand Teton Park population of swans appears to be small but stable, and probably most or all of the park's suitable habitats are now being used by swans. Sources of egg and cygnet mortality are very difficult to judge, but appear to be no greater than in other areas of the general region. A few of the swan pairs, such as those at Christian Pond, have become highly tolerant of human presence, although in general trumpeter swans tend to be highly wary of humans as well as intolerant of other swans in the near vicinity. Disturbance at Christian Pond, which is perhaps the most productive and diversified of all pond habitats in the park in terms of abundance and diversity of breeding aquatic birds, should thus be kept at a minimum.
Table 1. Swan Breeding Habitats, Grand Teton National Park, 1970-75.

<table>
<thead>
<tr>
<th>Breeding Habitat</th>
<th>Total Yng. Raised</th>
<th>Years of Success</th>
<th>Approximate Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian Pond</td>
<td>14</td>
<td>4/6</td>
<td>30</td>
</tr>
<tr>
<td>Pinto Ranch</td>
<td>9</td>
<td>4/6</td>
<td>20</td>
</tr>
<tr>
<td>Sawmill Pond</td>
<td>6</td>
<td>3/6</td>
<td>5</td>
</tr>
<tr>
<td>Two-Ocean Pond</td>
<td>5</td>
<td>3/6</td>
<td>15</td>
</tr>
<tr>
<td>Swan Lake</td>
<td>5</td>
<td>2/6</td>
<td>35</td>
</tr>
<tr>
<td>Elk Ranch Reservoir</td>
<td>2</td>
<td>1/6</td>
<td>100</td>
</tr>
<tr>
<td>Hedrick Pond</td>
<td>1</td>
<td>1/6</td>
<td>25</td>
</tr>
<tr>
<td>Glade Creek</td>
<td>1</td>
<td>1/6</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2. Trumpeter Swan Breeding Success, Various Areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Ave. Total Pairs</th>
<th>Ave. Total Broods Raised</th>
<th>Ave. Total Cygnets Raised</th>
<th>Broods Per Pair</th>
<th>Cygnets Per Pair</th>
<th>Cygnets Per Pair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Teton Nat. Park ca. 7.5 (’69-74)</td>
<td>3.7</td>
<td>7.5</td>
<td>0.47</td>
<td>1.0</td>
<td>2.14</td>
<td></td>
</tr>
<tr>
<td>Red Rock Lakes N.W.R. (’71-73)</td>
<td>33.7</td>
<td>10.7</td>
<td>24.0</td>
<td>0.32</td>
<td>0.71</td>
<td>2.24</td>
</tr>
<tr>
<td>Alaska (1968)</td>
<td>666</td>
<td>251</td>
<td>923</td>
<td>0.38</td>
<td>1.38</td>
<td>3.60</td>
</tr>
</tbody>
</table>

Table 3. Breeding Success Based on Late Summer Adult:Cygnet Ratios.

<table>
<thead>
<tr>
<th>Area</th>
<th>Ave. No. of Adults</th>
<th>Ave. No. of Cygnets</th>
<th>Ratio of Adult:Cygnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Teton Nat. Park (12 yrs, ’60-74)</td>
<td>21.5</td>
<td>6.8</td>
<td>3.25:1</td>
</tr>
<tr>
<td>Yellowstone Nat. Park (1960-1970)</td>
<td>52.4</td>
<td>5.0</td>
<td>10.5:5</td>
</tr>
<tr>
<td>All of U.S.A. (1954)</td>
<td>580</td>
<td>82</td>
<td>6.8:1</td>
</tr>
</tbody>
</table>