

MULTI-YEAR MONITORING PROGRAM FOR TUNDRA SWANS ON THE NORTH SLOPE OF ALASKA

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Editors Note: Following is a summary prepared from a PowerPoint presentation given at the 20th Conference. Only a few selected figures from slides are presented here along with the highlights of text taken from selected slides.

INTRODUCTION

ConocoPhillips, Alaska, Inc. is not required by any regulatory permit stipulations to perform Tundra Swan monitoring activities and surveys. However, swans are considered a key focal species for study due to their tendency to return to the same breeding area location each year, the relative ease of identification during aerial surveys, and because we believe the Tundra Swan would help us assess the overall health of the water bird communities that visit our oil fields.

We consider this program as a report card on how we are doing. I explain to my managers that this type of study would fall under a category I call “maintaining our license to operate.” To their credit, they have supported this program since 1988 and these surveys are now included in all baseline data programs as a way to assess potential effects on Tundra Swans by monitoring their distribution and abundance before and after development in the oil fields. Information on nest locations has also been used during project design to route roads away from these areas.

Prior to regional aerial surveys beginning in the 1960s, Tundra Swans were described in terms of a few swans (Bailey 1948) or scattered pairs more or less irregularly (Gabrielson and Lincoln 1959) occurring each season.

With the onset of aerial surveys in the late 1960s and 1970s (King 1970, Welling and Sladen undated, Angus Gavin 1972), better information on distribution and abundance of Tundra Swans on the North Slope was collected.

Ground surveys, including Bill Sladen’s marking program (Sladen and Kistchinskii 1977), behavior

and habitat studies on the Colville River by a number of researchers (Hawkins 1986, Earnst 1992), productivity surveys in the Arctic National Wildlife Refuge (Monda 1991), and Lisburne disturbance monitoring by ABR, Inc. (Murphy and Anderson 1993), in the 1970s and 1980s improved our understanding of the Tundra Swan’s ecological role on the north slope and on staging and wintering areas.

The region saw more intensive aerial surveys again in the 1980s, as U.S. Fish and Wildlife Service and the oil companies increased their interest in the overall health of this population as oil fields expanded, culminating in a long-term semi-annual survey of the Greater Kuparuk Oilfield beginning in 1988.

SURVEY AREAS

Areas surveyed for Tundra Swans, 1989–2005 (Figure 1):

- Ranged in size from 2,200–6,000 km² annually.
- Initially covered the Greater Kuparuk Area oilfield and Oil and Gas Lease 54.
- Expanded to cover the Colville River Delta and National Petroleum Reserve-Alaska (NPR-A), to the west of the Greater Kuparuk Area field.

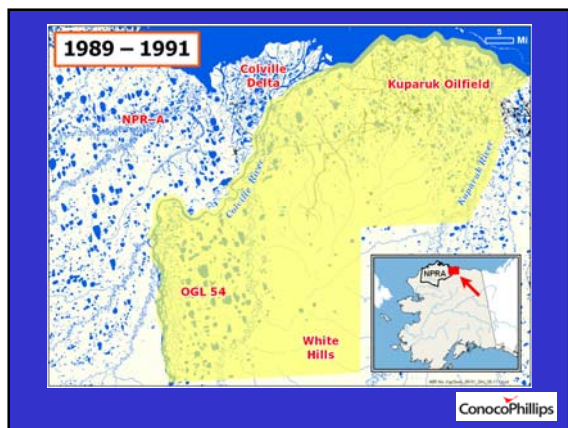


Figure 1. North Slope of Alaska. Note locations of the Colville River Delta and the Greater Kuparuk Area oilfield.

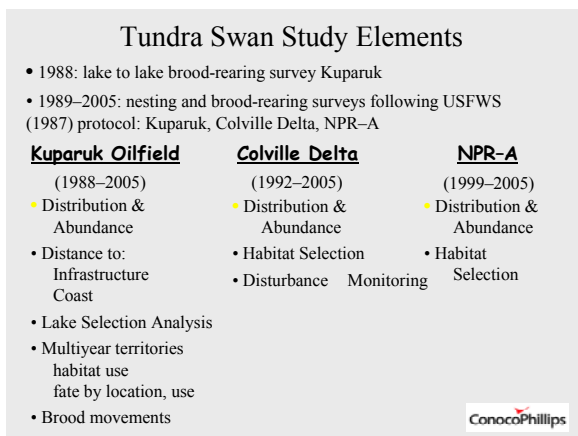


Figure 2. Survey methodology, years of data collection, and types of analysis.

It is important to note that there are 17 years, beginning in 1988, of consistent data from the Greater Kuparuk Area which represents the longest running swan data set in Alaska (Figure 2).



Figure 3. Tundra Swan nest habitat.

NEST HABITAT AND STUDIES

Tundra Swans prefer to nest in (Figure 3):

- Moist tussock or shrub tundra
- Complex polygonized tundra
- Salt-affected habitats
- Patterned wet and moist tundra complex

Nesting activity on the North Slope is highly correlated with spring temperatures. Comparing nest numbers with thawing degree-days (the number of degrees above 0° C) in the swan arrival and nesting period over 16 years, we found nest numbers were highest in warm springs with early snow melt and lowest in cool springs with late snow melt.

Based on 17 years of data in the Greater Kuparuk Area oilfield, the number of nesting swans increased in the early years to a peak in 1996 with 116 breeding pairs and has fluctuated between 72 and 115 breeding pairs since (Figure 5). Spring weather conditions influence nesting activity, and the data indicate that the best habitat may already be occupied by territorial swans, possibly limiting future increases in nesting. More fluctuations occur in the number of nonbreeding swans each year. Figure 4 illustrates swan nest distribution and oilfield infrastructure. 2002 was a high year for all three areas.

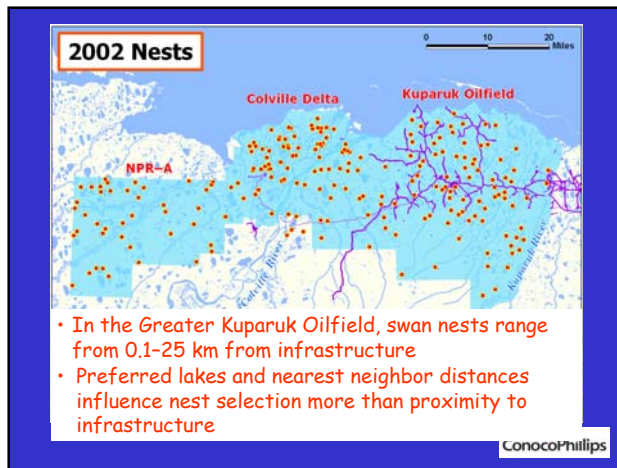


Figure 4. Tundra Swan nest distribution in 2002 on the North Slope.

Nest fate studies (2 years)

- Fate of nests close to infrastructure (90%) were similar to nests located in remote areas (85%).
- Fate of territories with >3 years of use were no more successful than those with single year of use.

Brood movements

Eleven broods were followed for 40 days in 1999:

- 2 broods remained on their nest lake.
- 9 broods moved between ≥ 2 lakes, not necessarily farther from infrastructure.
- 1 brood crossed moderately busy road twice during observation period.

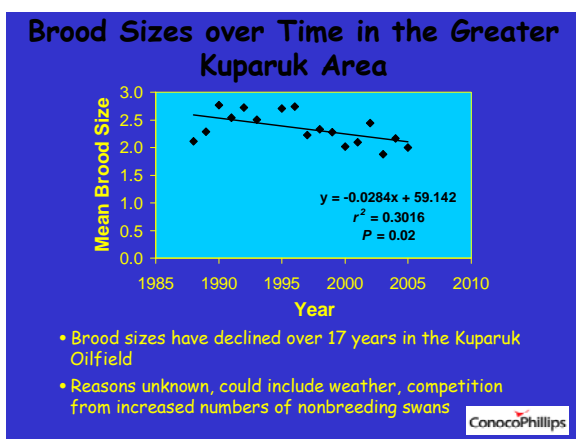


Figure 5. Brood sizes 1985-2005.

FUTURE MONITORING PROGRAM

ConocoPhillips plans to continue its Tundra Swan study and will:

- Continue aerial surveys to obtain broad regional population information.
- Conduct habitat selection analyses for Greater Kuparuk Area locations and compare with data from Colville Delta and NPR-A.
- Evaluate brood use of lakes to assess which lakes get repeated use over the years.
- Evaluate pre-/post-development use of the NPR-A and Colville Delta.
- Evaluate whether swans avoid areas developed for oil production by combining data on infrastructure and years before development from each region.
- Analyze declining brood size in Greater Kuparuk Area.
- Incorporate telemetry and banding to the program at a pilot scale in 2006.

Obtaining habitat information for the Greater Kuparuk Area oilfield could allow us to evaluate the multiyear territory data set we have to determine if habitat differences exist between long-term territories and those of single use and to look at possible differences (or similarities) in habitat selection within the other areas studied to the west (Colville Delta and NPR-A).

Applications of telemetry data

The addition of telemetry data will refine our understanding of:

- traditional use of nesting and brood rearing areas
- use of staging areas inside and outside of the oilfields
- wintering areas used by oilfield swans
- chronology of use

EDUCATION AND OUTREACH

ConocoPhillips plans to ultimately involve North Slope Borough students in the satellite tracking program by:

- Developing curriculum on swan biology in coordination with village educators
- Involving students in swan capture(s)
- Website development by schools

- Pen Pals with schools on East Coast

In addition, we will continue to educate ConocoPhillips employees and involve ConocoPhillips employees in swan capture(s).

In summary, ConocoPhillips will continue these studies in expanded areas as its commitment to monitor these birds as part of our License to Operate.

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