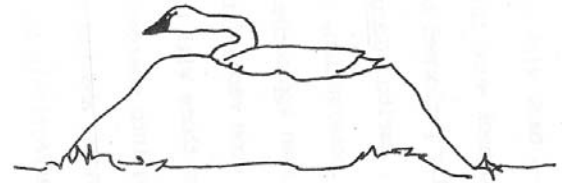


# Tundra Swans of the Mackenzie Delta

*Project Update May 2003*

## Who is running this project?

The Canadian Wildlife Service (Jim Hines) in collaboration with the University of Northern British Columbia (Dr. Russ Dawson and Heather Swystun). Approval and support has been received from local Renewable Resource Councils, Hunters and Trappers Committees, GRRB, WMAC NWT, and WMAC North Slope. Monitoring tundra swan populations in the Mackenzie Delta Region began in 2001. Heather Swystun (Swan Lady), an Inuvik resident helped design, raises funds, and collects data for the project as her graduate thesis study. Douglas Esogak (Joe), an Inuvialuit beneficiary, has assisted in collecting field data for the last two years.

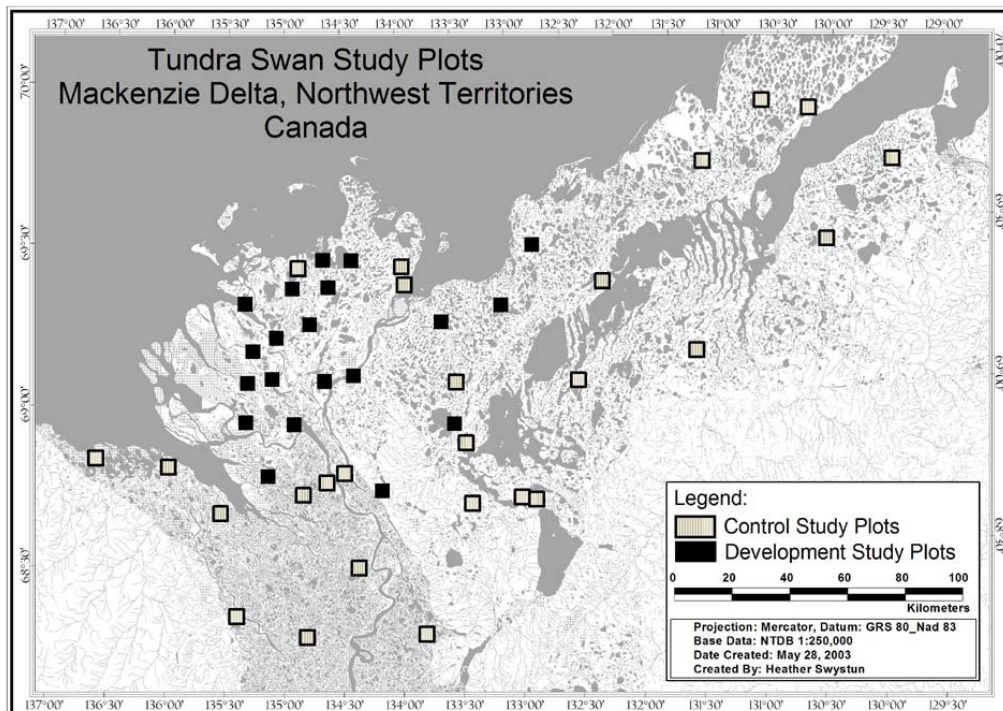


Hawkins 1986

## What is the project about?

This project is about monitoring environmental change and effects of development in the Mackenzie Delta using tundra swans as an “indicator” species for other birds and waterfowl. Objectives of this study are to: (1) monitor consistent study plots for tundra swans at “development” and “non-development (or control)” sites; (2) document nesting success, brood survival, and community local knowledge of tundra swan biology; and (3) evaluate possible factors limiting reproductive success such as habitat and climate.

## Where does the project take place?



## Who is this project for?

You. The information we are collecting will assist you, the Gwich'in and Inuvialuit, responsible government agencies, and the public at large in tracking the health of tundra swans and other waterfowl species.

## Who has contributed to this project so far?

FUNDING AGENCY	YEAR	Financial Contribution	In-Kind
Canadian Wildlife Service	2001-2003	21%	Yes
Northern Ecosystem Initiative	2001-2002	19%	
Wildlife Management Advisory Committee (WMAC) NWT (Canadian Wildlife Service)	2002	16%	
Wildlife Habitat Canada	2002-2003	10%	
Indian and Northern Affairs (MVCIMP, CEAMF)	2001-2002	7%	
Ducks Unlimited's Institute for Wetland and Waterfowl Research	2001-2002	5%	
Wildlife Management Advisory Committee (WMAC) - North Slope	2001-2003	5%	
Gwich'in Renewable Resources Board	2001-2002	3%	Yes
NWT Millennium Scholarship	2001-2002	3%	
Northern Scientific Training Program	2001-2002	3%	
NWT Scholarship	2002	3%	
Parks Canada - Western Arctic Field Unit	2001	2%	Yes
UNBC	2001-2002	1%	Yes
GNWT Resource Wildlife and Economic Development	2001-2003		Yes
Joint Secretariat	2001-2003		Yes

## Why study tundra swans?

By protecting the habitat that swans need, we will also be protecting birds that share this habitat like ducks, geese, some shorebirds, raptors, and songbirds. Here are some reasons for studying swans:

**First**, tundra swans are an important subsistence resource to both Gwich'in and Inuvialuit people. As one hunter put it when talking about the spring waterfowl hunt:

*It's what I like to do best [The spring waterfowl hunt]. I never miss. It's like Christmas for me. Do you know how much swans I harvest each year? I make dry meat out of swans and geese. I boil the bones and make soup out of them. I don't waste anything. You wouldn't believe how much goose I eat. **Aklavik Hunter***

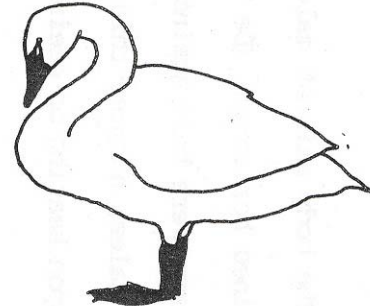
**Second**, your home, the Mackenzie Delta Region, is critical to over 137 species of birds, including ducks, geese, and swans! This critical bird habitat is being affected by oil and gas development. What will be the effect of development on all of these birds?

We can't answer that question without detailed studies, involving both scientific and local knowledge, on all 137 species of birds their habitat use and nesting biology, a **"huge"** and expensive task! So what can we do? One affordable solution is to protect the habitat of an "indicator" species. Tundra swans make a good "indicator" or "umbrella" species because they are widely distributed across the delta and they are easy to see from the air making them cheaper to study than other birds. By studying swans we can help many birds.

**Third**, tundra swan productivity is declining in other oil and gas development areas. In Alaska, where oil and gas development is operational, there is a significant decline in the production of young swans.<sup>3</sup> The Mackenzie Delta Region has approximately one sixth of all the tundra swans in North America. They come here to produce young. Very little is documented about their biology in this region so we need to know more in able to protect them for future generations!

**Does protecting tundra swan habitat and nesting areas help protect other waterfowl species like ducks and geese?**

**Yes.** By protecting the habitat that swans need, we will also be protecting birds that share this habitat like ducks, geese, some shorebirds, raptors, and songbirds.



Hawkins 1986

**Does this mean swans are the only birds we need to study?**

**No.** The more we learn about all bird species the better equipped you will be to make good decisions about managing their populations.

**How are we studying tundra swans?**

In this study we are documenting the use of the Mackenzie Delta region by tundra swans. We are learning about tundra swan nesting biology and how they use their habitat. We have established 46 “plots” or consistent areas where we count swans, swan nests, and young (productivity) each year so that we can track changes. Plots are located where development is proposed and where development will likely not occur. We have also completed 31 interviews with local elders and hunters from Inuvik, Tuktoyaktuk, Aklavik, Tsiigehtchic, and Fort McPherson to learn about tundra swan biology through local people.

**Who was interviewed?**

**Aklavik Gwich'in**

Allen Koe  
Dale Semple  
David Edwards  
John Carmichael

**Aklavik Inuvialuit**

Donald and Elizabeth  
Aviguana  
Jacob Archie  
Danny C. Gordon  
Carol Arey

**Fort McPherson**

Robert Alexie Sr.  
Thomas Koe  
Neil Colin  
Eileen M. Koe

**Inuvik-Gwich'in**

Tommy Wright  
Willie Simon

**Inuvik-Inuvialuit**

Ester McLeod  
Shingatok Leffingwell  
Rhoda Esogak  
Gilbert Kasook  
Edward Lennie  
Sarah Tingmiak

**Tsiigehtchic**

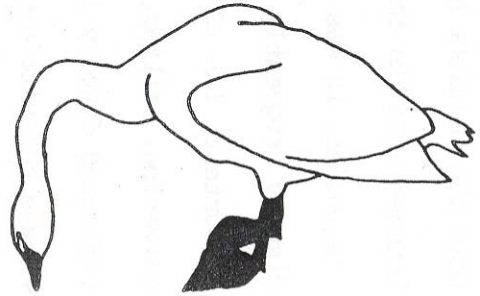
David Kendo  
Tony Andre  
Hyicin Andre  
George Nidichi

**Tuktoyaktuk**

Billy Jacobson  
Charles Pokiak  
Norman Felix  
Edgar Kotokak  
Adam Emaghok  
Annie Emaghok

## What will happen with all these interviews?

Interviews are being summarized and verified with people who were interviewed. The final product will hopefully be a series of stories told by these people about their understanding of tundra swans and how they are an important part of their lives. The final product will depend on what each individual interviewed is comfortable with. Finally, I will attempt to combine all the stories into one story about tundra swans in the delta region based on my interpretation of what people have told me. Raw interviews, most recorded digitally, will be stored and catalogued with the respective Inuvialuit and Gwich'in cultural centres, renewable resource boards, and the Prince of Wales Heritage Museum once all stories are complete.



Hawkins 1986

## When will these stories be done?

Hopefully, these stories will be complete by Christmas 2003.

## What do we do in the field each year when monitoring and studying tundra swans?

### JUNE

- We count adult swans and nests (Breeding Survey)
- Survey is done from the air
- We describe swan nest sites (habitat)

### JUNE-JULY

- Determine when eggs were laid, how many there are, and how big are they (Nesting Ecology)
- Visit nests by boat and walking through thick bugs

### JULY

- We determine nest success (hatch or fail) for 96 nests
- We determine nesting habitat in more detail
- Visit nests with helicopter

### AUGUST

- We count adults and young swans (Productivity Survey)
- Survey is done from the air

### 2001-2002

- Completion of local knowledge interviews

## **What is happening with the project in 2003?**

We will repeat the fieldwork aspect of this study to collect a third year of data in hopes of collecting a more typical year. The local knowledge data collection is now finished. Upon completion of this years field season, we will publish a final report and make recommendations for future monitoring of tundra swans.

## **Do we work with volunteers?**

**Yes.** Local aboriginal volunteers helped on the ground in the summers of 2001, 2002, including 4 youth and 3 adults.

## **How is the population of tundra swans doing?**

In the late 1950's the entire Eastern population of Tundra Swans was crudely estimated at  $35,000 \pm 3032$  swans (1956-60 Average). This number was considered low. By 1976, the Eastern population has doubled to approximately 78,636. The reasons for this increase are not clear but may be due, in part, to changes in habitat use and protection from hunting. Over the last twenty years the Tundra Swan population has increased slowly but not significantly<sup>2</sup>.

Today, the Eastern population of tundra swans (swans that winter in the eastern USA and nest mostly in the NWT) is estimated at  $98,598 \pm 3802$  (1997-2001 Average). The population is stable, currently.

## **How many tundra swans are there in the delta?**

Earlier general waterfowl surveys in the ISR (1990-93), estimate  $16,913 \pm 925$  tundra swans in a larger (26 605 km<sup>2</sup>) study area. If we add the number of swans in the southern delta region not surveyed, we estimate there are approximately **33,000** tundra swans in the Mackenzie Delta Region, **1/6<sup>th</sup> of all tundra swans in North America!**

## **Is there a difference between swans in 2001 and 2002?**

**Yes.** In 2001, only 8% of the territorial pairs (22/263) raised broods during the exceptionally delayed breeding season. In 2002, 14% of the territorial pairs (38/264) raised broods. We saw more flocked non-breeding birds in the development plots in 2002. Distributions of tundra swans are clumped suggesting areas of preferred habitat. Overall, numbers of breeding pairs and nests were similar in control and development plots but nest success was lower in 2002, 43% compared to 72% in 2001. This may be due to a large storm that occurred at hatch or high predation rates. In both years, nesting effort was equal in control and development plots however, control plots produced 3% more young in 2001 and 16.5% more young in 2002. Productivity in 2001 was 6.7% young and 9.1% young in 2002.

## **What are we learning from local people about tundra swan biology?**

Local Knowledge has identified a number of important spring staging, summer moulting, and fall staging areas. Spring staging areas are 'critical' to swans that have flown from the Peace-Athabasca Delta direct to the Mackenzie Delta. Tundra Swans use up a lot of energy on this flight and are very hungry when they arrive. These areas include:

- Point bars and sandbars along Mackenzie River and its tributaries where *Equisetum arvense* (goose grass) appears to play an important role in Tundra Swan spring diet.
- Areas north and south of Travaillant Lake where ice melts early in the spring.
- South facing shores of lakes and rivers in the Kugaluk River-Husky Lake area where the ice melts first.

Local people are also teaching us about spring migration patterns, behaviour, and food swans are eating.

## **How are tundra swans using proposed oil and gas development areas?**

Three areas were announced as drilling sites in fall 2002:

- Niglingtak (Kendall Island Bird Sanctuary)
- Taglu
- Parsons Lake

We found that swans use these areas for feeding and nesting and have recorded two years of data so far at Niglingtak and Taglu and near the Parsons Lake sight before any development has occurred allowing us to monitor future effects of development.

## **What are the concerns about development in tundra swan habitat?**

Concerns:

1. Areas where drilling and pipeline structures are built can cause swans to move away from their traditional nesting and feeding areas.
2. Human activity will increase because of gas drilling and pipeline construction. Based on areas in Alaska, this activity can reduce nesting success (the number of eggs that hatch).
3. Garbage produced by humans around construction sites can attract predators that would not otherwise be there and can increase predation on nesting birds.
4. Increased air traffic disturbs geese and swan hunting areas.
5. If spring staging, summer moulting (period when waterfowl don't fly), and fall staging areas are not considered when planning pipeline routes and drilling areas, critical waterfowl habitat could be lost.

## **What can be done right now to protect tundra swans and other waterfowl species for our children?**

- Ensure oil and gas development occurs between November and April in the winter months.
- Ensure all waste and garbage is properly disposed of, especially liquid waste that may affect the health of critical wetlands and the food they provide for ducks, geese, and swans.

## **Tundra Swan Research Needs:**

Gas and pipeline development will have an impact on waterfowl habitat so to reduce these impacts we need to:

- Monitor Tundra Swan use and nesting habitat around proposed drilling areas before development. By doing so we can understand how drilling affects them and can adjust how we develop future drill sites.
- Monitor areas where no drilling occurs so we can compare these areas with drilling areas to better understand the change.
- Determine critical spring and fall staging areas that need protection and minimize impacts in these areas.
- Determine important moulting areas that need protection and minimize impacts in these areas.

Subsistence Harvest:

- Tundra swans subsistence estimates established from harvest studies may be too low. Previous research by Bromley 1986 and interviews completed in this study found that some people were unaware that hunting swans is now legal. Understandably, respondents may have been afraid to report swans harvested during their interviews. In the past, swans were illegal to hunt and people were afraid to talk about eating them. Today, it is no longer illegal for aboriginal people to hunt waterfowl in the springtime and people may now be more willing to discuss the swan hunt. RRCs and HTC's may want to recommend that swans become a focus for future harvest study projects to ensure an accurate subsistence level is recorded for future generations.

Concerns in the wintering grounds:

- Populations of tundra swans in Maryland have declined significantly. This is due to competition from a rapidly growing population of mute swan introduced to the continent from Europe. Management of mute swan populations are needed to restore important feeding areas for tundra swans in the wintering grounds.
- Hunting of tundra swans is permitted in five US states with 9600 permits authorized annually (one per hunter).<sup>2</sup> Since 1995 an average of 4000 swans are taken annually.<sup>2</sup> Further research is needed to understand spatial and temporal movement, site fidelity, sub-population units or affiliations, and to monitor survival rates.<sup>2</sup> This information is essential for effective management and to reduce conflicts in resource use.

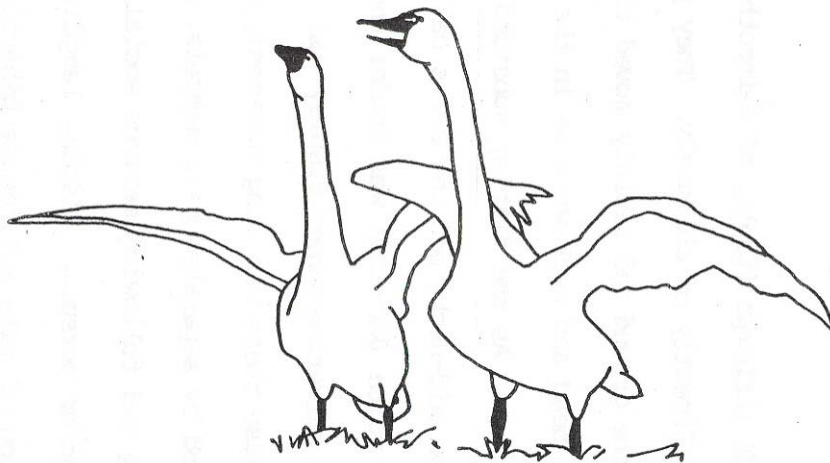
If you have any questions about this update, please do not hesitate to contact: Heather Swystun 867-777-3834 or [hszystun@canada.com](mailto:hszystun@canada.com).

## References

1. Martell, A.M. et al. 1984. Wildlife of the Mackenzie Delta Region. Boreal Institute for Northern Studies, University of Alberta. Occasional Publication No. 15. Edmonton, Alberta.
2. Serie, J.R., D. Luszcz, and R. Raftovich. 2001. Population trends, Productivity and Harvest of Eastern Population Tundra Swans. Proceeding of the Fourth International Swan Symposium, Waterbirds, special publication No. 1: Vol. 25. pp. 32-36.
3. Ritchie, J.R., J.G. King, A.A. Stickney, B.A. Anderson, J.R. Rose, A.M. Wildman, and S. Hamilton. 2001. Population trends and Productivity of Tundra Swans on the Central Arctic Coastal Plain, Northern Alaska 1989-2000. Proceeding of the Fourth International Swan Symposium, Waterbirds, special publication No. 1: Vol. 25. pp. 32-36.
4. Bromley, R.G. 1996. Characteristics and management implications of the spring waterfowl hunt in the Western Canadian Arctic, Northwest Territories. *Arctic*; 49(1): 70-85.
5. Hawkins, L.L. 1986. Nesting behaviour of male and female Whistling Swans and implications of male incubation. *Wildfowl* 37: 5-27.

## Thank You !

A sincere thanks all the people and organizations that have supported this project to date. People who have participated in interviews, helped with us while we are on the land, put up with our tiresome work in the chopper, provided office space, acted as field assistants, provided mapping data, transcribed interviews, entered data, offered research advice, provided field support and equipment. The types of in-kind support that goes into a project like this extensive as are the number of people who provide that support. Thank you to all of you, we couldn't do this without you.



Drawings are traced from actual video footage collected by Hawkins 1986.