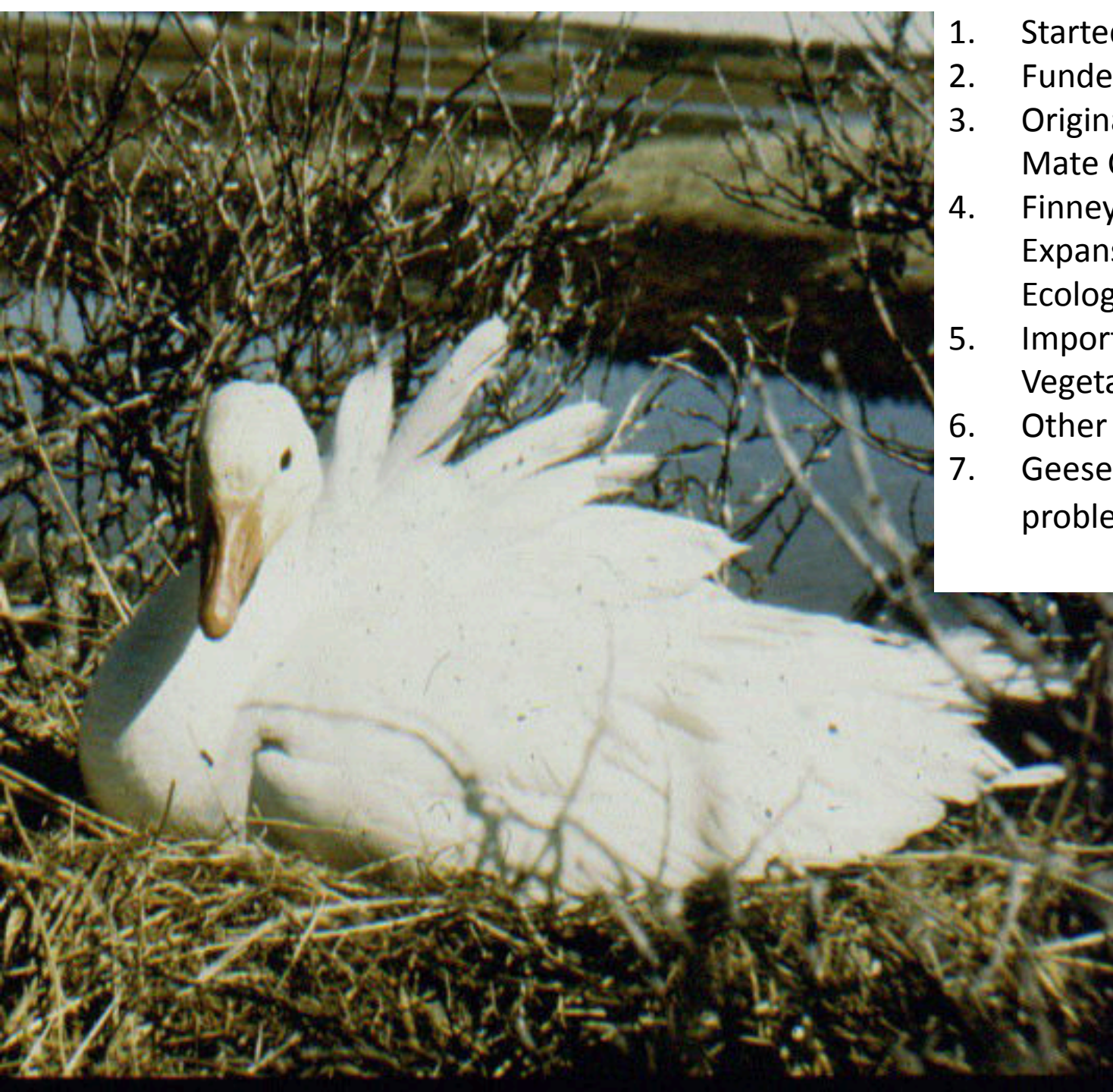


An aerial photograph of a coastal area, likely La Pérouse Bay. The landscape is a mix of dark, wet mudflats and lighter, sandy or silty areas. A small cluster of buildings, including a prominent white structure, is situated in the center-left. A winding path or road leads from the bottom left towards the buildings. The overall scene is desolate and remote.

La Pérouse Bay

The first 40 years.

A tribute to Bob Jefferies



1. Started in 1968.
2. Funded (\$2000) CWS.
3. Originally Genetics and Mate Choice.
4. Finney and Newton, Expansion into Population Ecology,
5. Importance of Geese – Vegetation interaction.
6. Other species of birds.
7. Geese as an international problem.

Bob in 1989



ORIGINS

- 1. Graham Cooch CWS. Data from Boas River.**
- 2. Cooke and Cooch, Evolution Paper 1968.(Behaviour affected genetic structure of population).**
- 3. \$2000 and a tent! 1968. Ken Ross and I, and much logistic help from Pat Worth.**
- 4. 1969. Volunteers and first banding with Ken Ross and Paul Mirsky. First fertile eggs sent to Ontario.**
- 5. 1970. George Finney and Ian Newton gave project an ecological component.**
- 6. 1972. Building of camp at Mast River Estuary (Camp Finney).**
- 7. 1973. First botanical studies. David Ealey.**
- 8. mid-1970s. Beginnings of Demographic work. Abraham and Davies.**
- 9. 1976. Beginnings of detailed vegetation analyses. Lewis followed by Jefferies.**
- 10. 1980s. Quantitative Genetics. Rockwell, E. Cooch and Findlay.**
- 13. 1980s. Population expansion and consequences. Francis, Kerbes**
- 12. Mid-1990s. Global consequences and the cull.**
- 13. 2000s Climate Change.**

1. Graham Cooch CWS. Data from Boas River.
2. Cooke and Cooch, Evolution Paper 1968.(Behaviour affected genetic structure of population).
3. Experimental studies at Guelph. (McNally)

The genetics of polymorphism in the goose

Anser caerulescens. ***Evolution* 22 289-300.**

Mate Selection and colour preference in

Lesser Snow Geese ***Behaviour* 53 151-158**





1. 1970. George Finney and Ian Newton gave project an ecological component.
2. 1972. Building of camp at Mast River Estuary (Camp Finney later the Cooke Shack).



George Finney c. 1972. Ian Newton c.1980

Camp Finney 1973

Long term Population Studies



- Some findings. 1. Blues and whites equally successful.**
- 2. Population growing c.8% per annum.**
- 3. Birds getting smaller – adults and young. Fewer young fledge.**
- 4. Age effects**

Botanical Studies.

David Ealey 1973 Transects & Quadrats.

First Exclosures. 1974 or 1975.

Martin Lewis 1976 -1978 York University.

Bob Jefferies 1978 – 2009. U. of Toronto



Senecio Congesta, Also *Elymus mollis*,
Hierocloe odorata, *Geum rivale*. *Lagurus*
ovatus. *Petasites* sp.



1972 Changes in vegetation 1989

View in 1978 of exclosure
erected c.1974



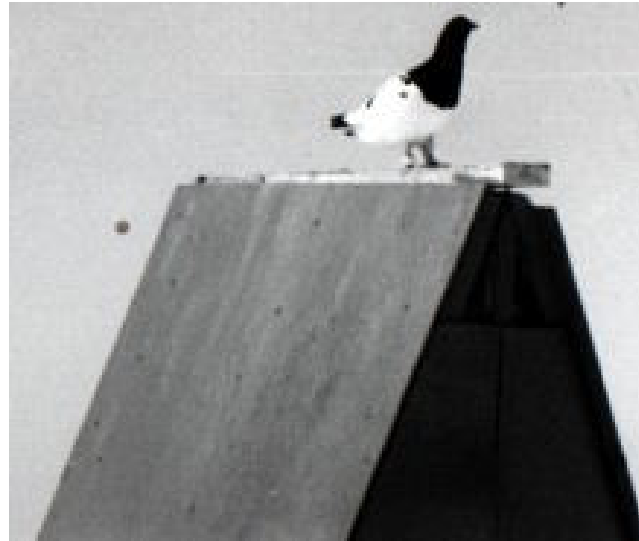
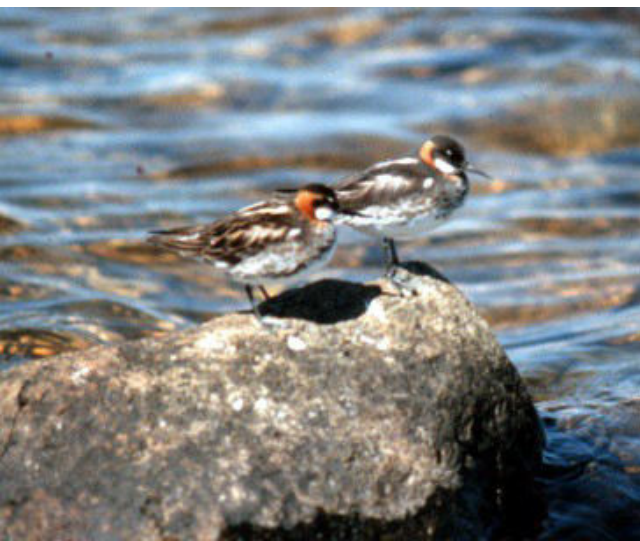
Bob's main contribution, while we worked together 1978 – 1992.

Thanks to help from Peter Kotanen

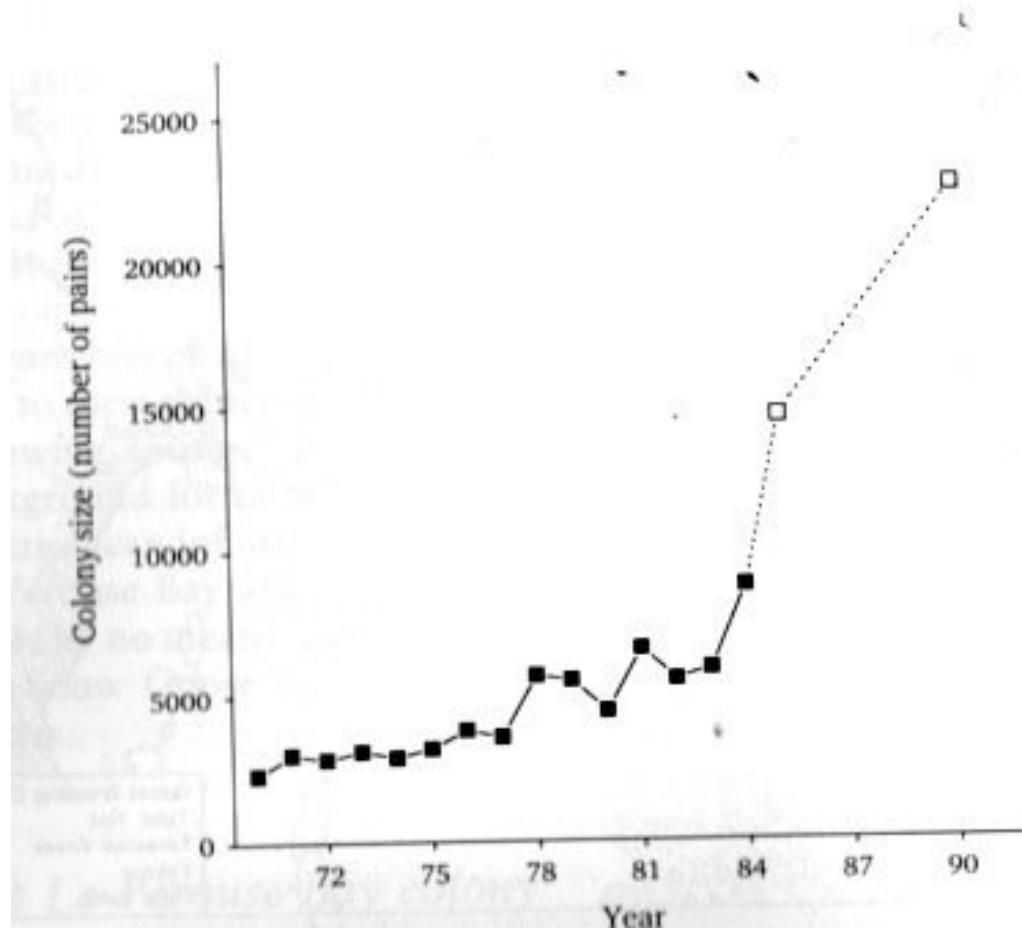
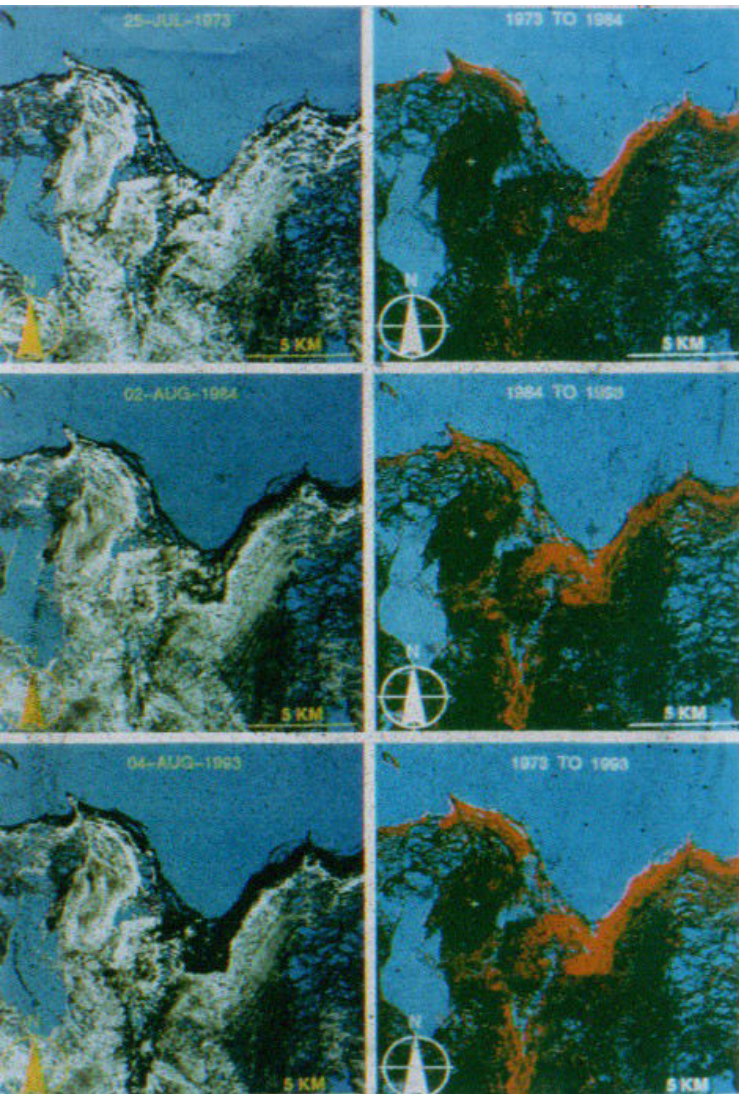
- 1) The role of geese in controlling vegetation, including both **positive** effects (Nitrogen cycling) at low densities, but increasingly **negative** effects as populations grew and colonies spread. At low densities, geese can maintain grazing lawns, but this is an unstable equilibrium; as goose populations increase, the system collapses.
- 2) The consequences of loss of vegetation cover for salt-marsh communities. Increased salinity and increased anoxia make degraded soils very inhospitable to plants, even resulting in the death of non-forage species such as willows.
- 3) The slow or nonexistent recovery of damaged sites, even when protected from geese.

Other Bird Studies.

1. Eiders; Guild and Schmutz.
2. Ptarmigan; Martin.
3. Savannah Sparrow; Weatherhead.
4. Red-necked Phalarope; Reynolds.
5. Semi-palmated Sandpipers; Gratto.



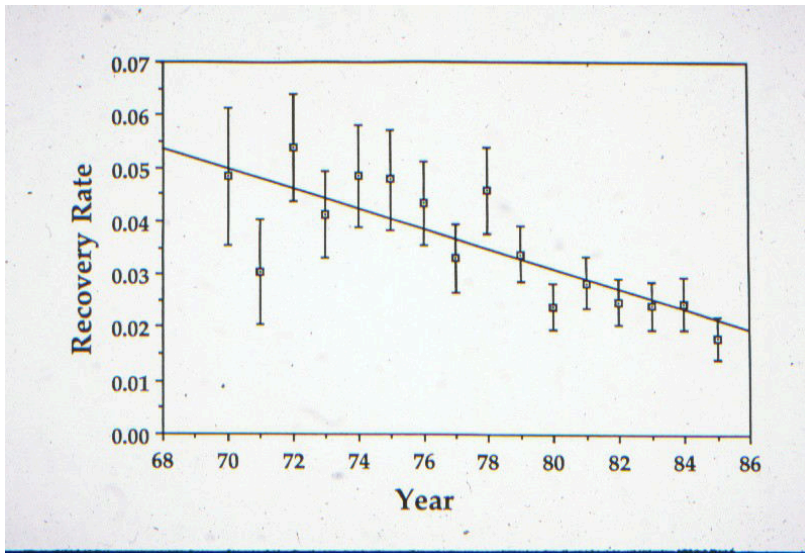
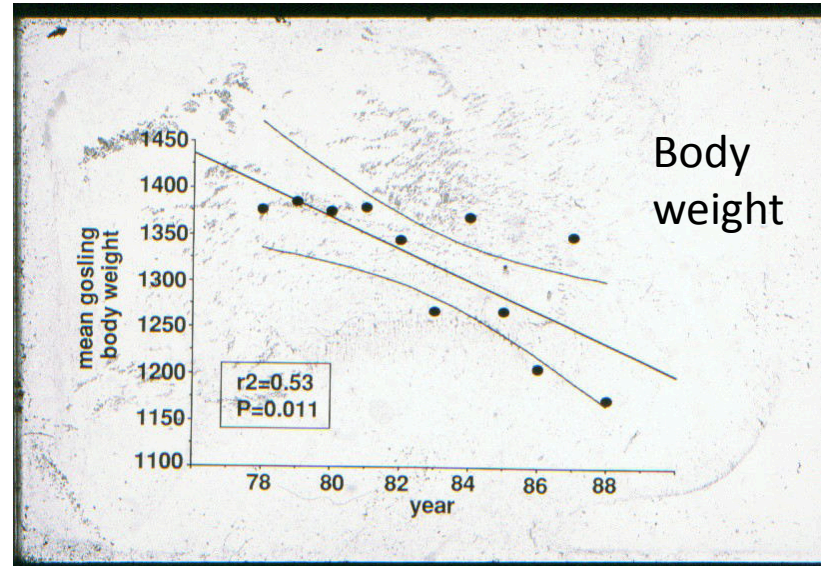
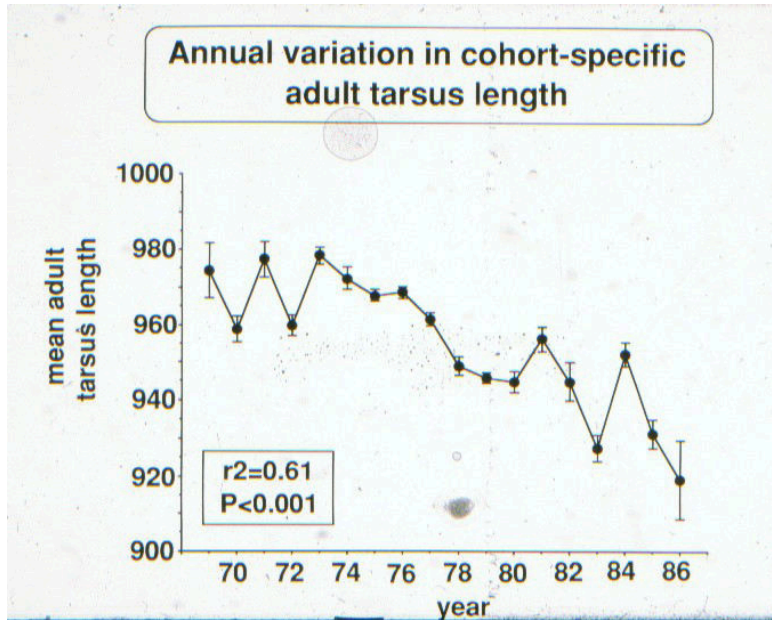
Population Growth and Habitat Degradation



Demography showed 8% per annum

Role of Kerbes' surveys

Effects of population growth on geese



More goslings were dying before fledging; They were growing more slowly. Lower weight and structural size. This made for smaller adults. With increasing population, of geese smaller **proportion** of birds killed by hunters. So despite greater problems for geese , their numbers still increasing. Changes in winter food availability – Coastal marshes to agricultural land (rice field weeds)

Management implications

Slow at realizing that the Snow Goose population was a global conservation problem.

“Chicken Farm” concept

We were underestimating population growth.

If a major cause of mortality was the hunters, could the goose population be brought down, (and the Arctic salt marsh damage reduced) if more hunting could be legislated? USGS and CWS examined this question and it became controversial. The reality was that over-winter survival was driven mainly by improved winter feeding opportunities.

Early mistakes involved the population modelling. Originally calculated that by **doubling** the amount of hunting the trend could be reversed.

However a number of years passed and later it was realised that a much more profound change in hunter behaviour would be needed to bring the goose population down, if the geese kept to their demographic pattern.

The necessary changes in hunter regulations were passed into law in USA and Canada

Most of the snow-goose studies since then throughout Canada have allowed an assessment whether these management changes have achieved any of their objectives. The Hudson Bay Project, the successor of the La Perouse Bay studies, have been focussed partially on answering this question and a paper will soon appear in JWM

