North Slope Focal species Monitoring,

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A) YUKON NORTH SLOPE GYRFALCON SURVEY 2014

This monitoring survey was part of a larger series of surveys of key focal species across the Yukon. This portion is designed to track the long-term status of gyrfalcon (*Falco rusticolus)* in the area of the Yukon draining to the Beaufort. The species, the largest of the true falcons is considered a tundra habitat obligate and an excellent indicator of ecosystem health for that ecoregion.

The survey builds on a data base from the mid 1970's. The survey was proposed in management planning as a valuable tool for tracking long term ecological processes on the Slope (Mossop et al 1986 – see appendix below), . In that document, an initial analysis showed a large population (about 120 pairs), well-spaced and relatively easy for regular monitoring. Other raptor species including Peregrine falcon (*Falco peregrinus),* Golden eagle *(Aquila cccchryaetos)*, Rough-legged hawk *(Buteo lagopus)*, and Snowy owl *(Nyctea scandiaca)* were also suggested for long term, regular monitoring surveys.

The data base on gyrfalcon contains annual survey results from 1976 – 1990. Then after a 16year hiatus, two years of survey were obtained during the International Polar Year funding (2007-2008). The 2014 survey was proposed by the author and was supported by the Wildlife Management Advisory Council (NS) as a continuation of the monitoring effort. Funding for the air survey was from the Yukon Government's IFA commitments, personnel and data handling etc were from the Yukon Research Ctr.

The survey: The survey was conducted on June 23 by helicopter from Inuvik. The author made observations and recorded data, student Graeme Poile and YG employee Heather Milligan assisted with observations. The survey took just under 6 hours of helicopter time.

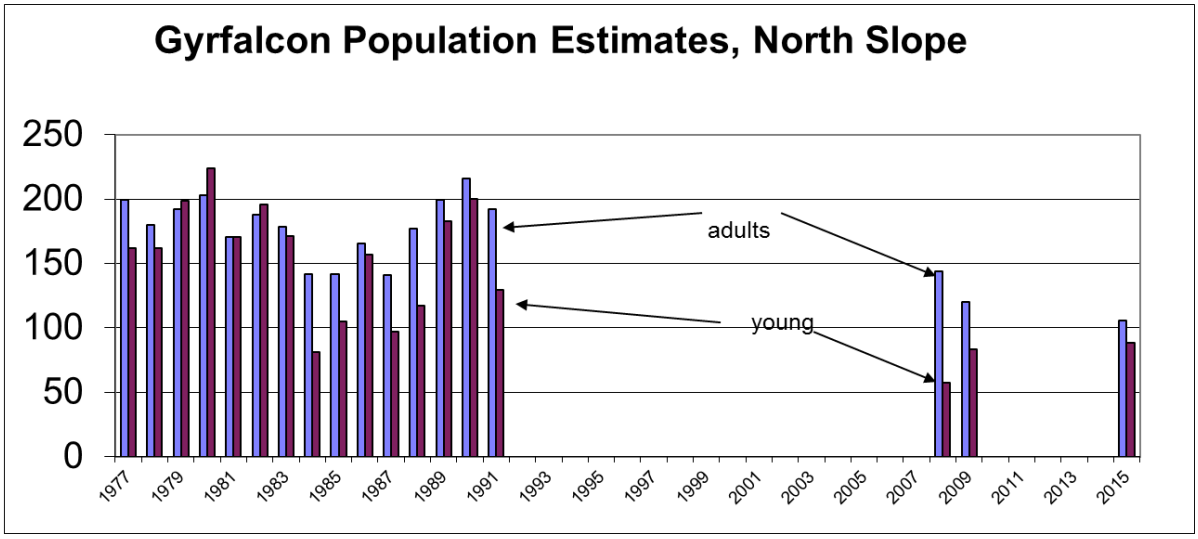
The survey was standardized visits to known historic nest sites established in earlier survey. Best practise that minimizes disturbance to breeding birds of prey were strictly observed. Thirty-two nesting pairs have been known in the surveyed area. Of these 25 were visited. This sample is just about 25% of all known nesting sites on the North Slope.

Survey conditions were not ideal. Severe wind made close approach to some sites difficult; confidence in the accuracy of observation is estimated at about 90%.

Results: Of the 25 nest sites visited, 11(44%) were occupied by adults and only 8(32%) were producing young.

Both these values were some of the lowest in the long term data base. Translating to an estimate of the total North Slope population (based on the total known historic sites), only about 100 adults were probably occupying the area in 2014.

Young being produced by the 8 successful pairs averaged 2.3 per nest site suggesting only about 89 young were produced on the whole slope.



Tempering this apparently gloomy result is the observation from the long term data base that gyrfalcon numbers and productivity tracked the number of ptarmigan on the slope very closely. And in fact, the number of ptarmigan (see below) were found to be extremely depressed in 2014. Ptarmigan numbers have been observed to be cycling in a 10-year period on the slope and predictably their numbers should have been declining in the 2010-15 period. The only troubling numbers remain those from the two IPY years which should have been peak years yet were well below historic highs.

It will be important to keep abreast of the status of the gyrfalcon on the Slope, notably in the predicted peak years of 2019-2021.

B) NORTH SLOPE PTARMIGAN SURVEY 2014

Ptarmigan are clearly a "Keystone" member of the tundra community on the North Slope. They provide a large part of the trophic energy transfer from the vegetative component through to the secondary consumer levels. Monitoring their numbers along with key predator levels (notably gyrfalcons) has been proposed as essential to tracking the fortunes of the tundra community generally (Mossop, 2005).

Ptarmigan densities on the Yukon North Slope and adjacent Old Crow flats were monitored most years from 1975 to 1991 (Mossop, 1976, 1985) and then during the International Polar Year funding (2007-8). These monitoring counts and observations were a combination of field notes recording relative abundance comparing years as well as straight-line aerial transects flown at very low elevation with helicopter. On the Slope, transects were chosen to allow direct navigation from known geographic points toward beacons at the DEW sites which were active in those days. Transects were chosen to allow exact replication of method. Relative change in abundance between years was the minimum objective.

Methods followed Bergerud, 1966. The vision was to conduct simple complete counts of territorial adults (mostly males) in a known area. Two observers counted all ptarmigan in the transect, 50 meters either side of the line. Care was taken by one observer to note birds flushed behind the aircraft. Timing of the counts has always been in the mid-June period when snow cover is basically gone and males can still be expected to be conspicuous on their territories. Assumptions are that in the open tundra of the areas involved, all birds over-flown at less than 50 meters will flush and that all are very obvious upon flushing.

In June of 2014 we returned to one of the original transects on the North Slope east of the Babbage River. Using more sophisticated (GPS) navigation we repeated the exact count as in the earlier decades. We selected the most-surveyed transect from the old work and the one that we felt would be the most faithfully repeatable in the future.

The transect was 62/3 km (area surveyed 6.23 sq. km.). Most of the flight was below 5 meters, conditions were not ideal because of relatively strong wind but it is unlikely we missed any ptarmigan. The few we observed were very obvious.

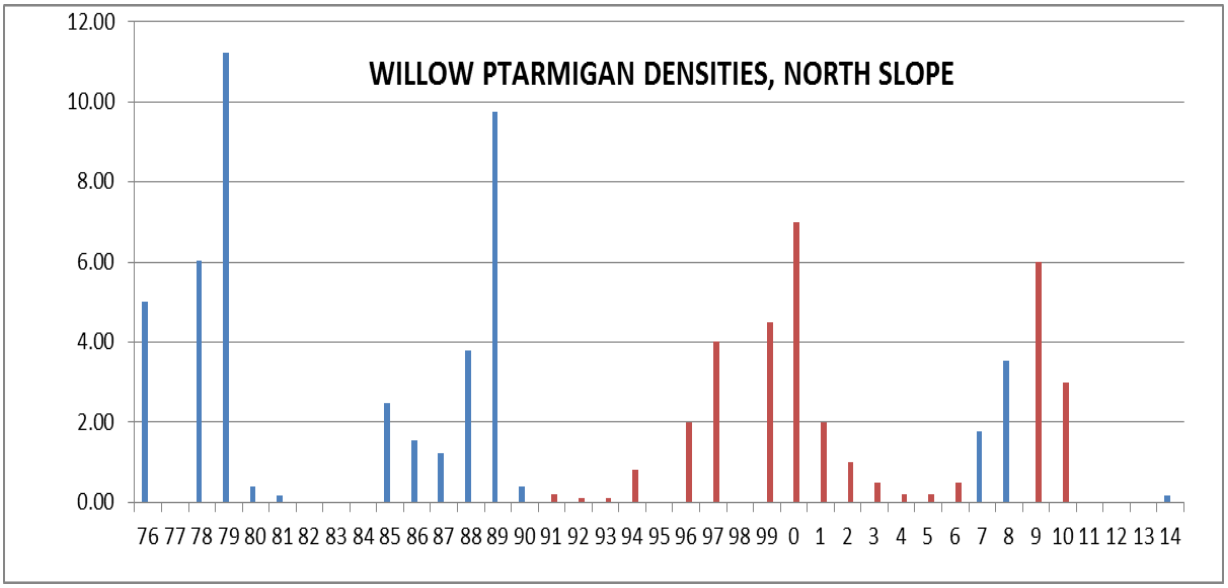
"Indicated territorial pairs" is a combination of pairs seen and isolated adults: (all observed were males).

The results compare with some of the **lowest** counts made using the same methods in the earlier surveys (See figure). Only Willow Ptarmigan were observed.

The ptarmigan numbers in the Northern Yukon throughout all years of survey have demonstrated a strongly cyclic fluctuation in a roughly 10-year period. If our counts are relatively accurate, the densities in 2007 and 2008 suggest the population (of at least Willow Ptarmigan) was at a relatively low point in the apparent cycle but could have been rising toward a possible peak in

about 2010. It follows that the 2014 count should have been in low and declining population (as observed). The only potentially troubling observation is an apparent trend toward smaller and smaller peak densities over the decades since the mid-1970's.

This decline in the peak populations has been observed in long term monitoring in the Southern Yukon and for reasons unknown may be linked to climate change over the same period (Mossop 2011). It will be important to keep tracking ptarmigan numbers on the Slope and explore explanation and mechanism causing these potentially disruptive changes.



Willow ptarmigan densities are territorial indicated pairs per sq. km.

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