2010 POPULATION STATUS OF THE PEREGRINE FALCON IN THE YUKON TERRITORY

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1.0 INTRODUCTION

This survey is the Yukon section of the Canada-wide periodic monitoring of the status of the Peregrine Falcon, a requirement of the Canadian Recovery Plan for the species. Historically, this effort began in the 1960's when a population of the interior race of peregrine falcon (Falco peregrinus anatum) was first described breeding on the riparian cliffs of the rivers draining the central Yukon (Cade and Fyfe 1970). The birds' numbers subsequently crashed and more recently have been recovering.

The 2010 survey was an attempt to visit a representative sample from all sub-populations of peregrine falcon known in the territory. The peregrine in the Yukon is thought of as a classic 'metapopulation'(McCullough, 1996). The groups, in part based on geographic separation (Figure 1), are mostly identified by demographic performance differences. (The subgroup nesting on the 'North Slope' is considered to be of the tundrius race.) Past findings have been detailed in a series of reports and published papers dating from the early 1970's (Cade & Fyfe 1970, Hayes & Mossop 1982, Mossop & Baird, 1985, Mossop 1986, Mossop & Hayes 1980, Mossop & Mowat 1990, Mossop, 1995, 2000, 2005).

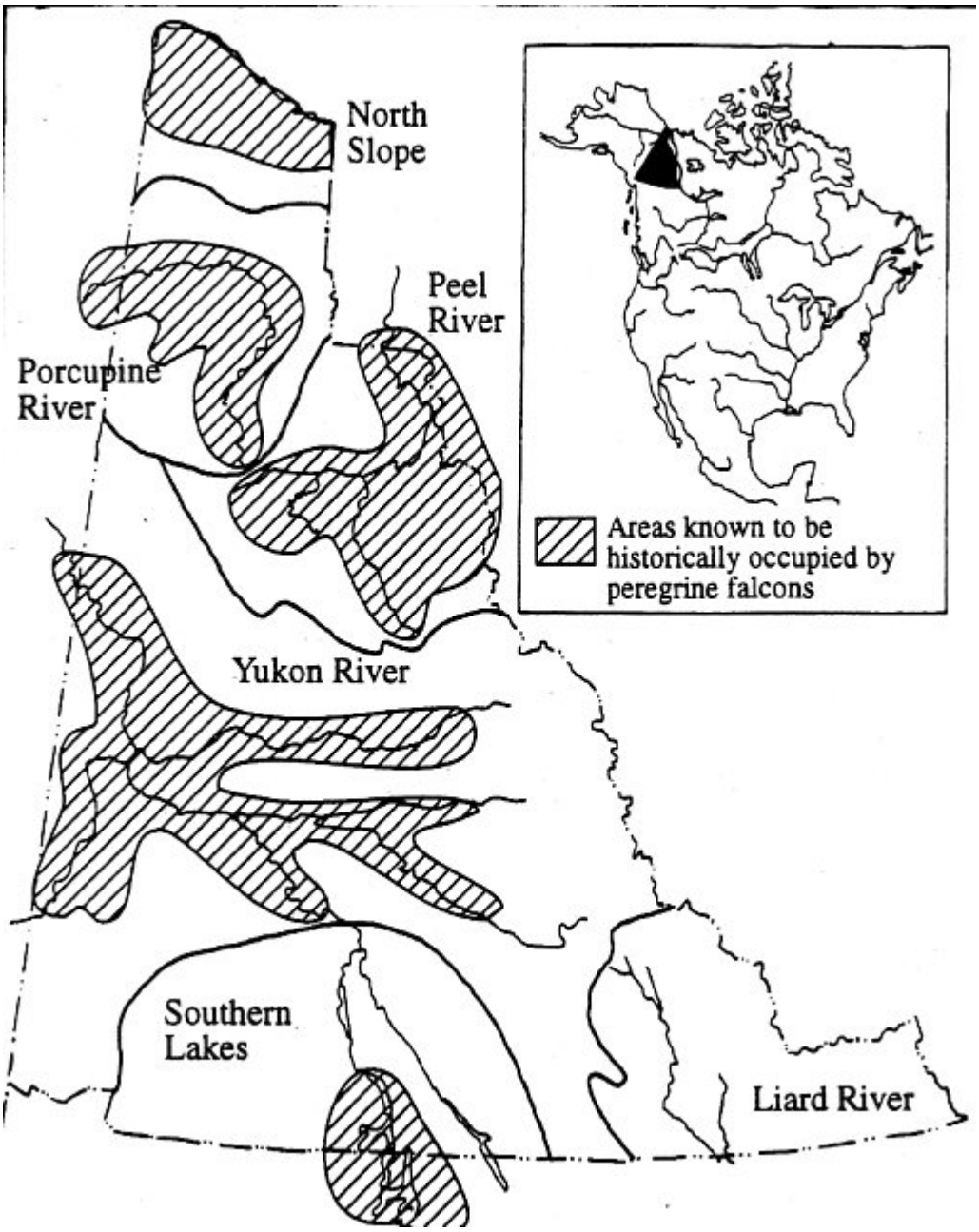


Figure 1. The Yukon Territory's major drainage basins and the five Peregrine Falcon sub-populations surveyed.

2.0 THE SURVEY

The methods of the 2010 survey were as close as possible to an exact repeat of earlier surveys. It was an intensive standardized survey of representative portions all 5 known occupied drainage basins. Fieldwork was conducted in two seasons, 2009 and 2010: (The large Yukon River sub-population was covered completely in the initial year). All survey was systematic search of riparian cliffs. By far the majority of survey was conducted from the ground by boat, supported where necessary by helicopter. On the arctic slope, all survey was conducted with helicopter. Although designed to depend on the fidelity of peregrines to former nest sites, the survey also attempted to cover all habitat between established pairs. Most nest sites were visited only once, in the brood rearing period. Survey began in late June in the southern populations and ended in the last week of July on the north slope.

Surveyed "nest sites" were cliff blocks given a permanent identifier in the Yukon raptor data base. At all potential nest sites a standardized procedure recorded the presence of adults, location of the nest ledge, number of young, and age of young. In some cases if the nest was visited, the young were banded with tarsal bands, and a collection was made of un-hatched eggs, eggshell fragments, moulted adult feathers, and prey remains.

Field survey teams: Six survey teams totaling 21 field workers, conducted the survey. Initial meetings for protocol standardizing were conducted in the months before the survey. A standardized field data sheet was provided by the author to each group; one member of each team was tasked with collecting and collating all data.

North Slope outside national park:
- D. Mossop (data)
- K. Wolfarth (student assistant)
- R. Florkiewicz
- E. McLeoud(Park ranger)

North Slope, Ivavvik park:
- G. Holroyd (data)
- M. Kirk
- P.Marchand
- S.Goeson

Porcupine drainage:
- D. Mossop (data)

K. Wolfarth (student assistant)
S. Frisch (volunteer)
B. Larsen (volunteer)
M. Owen (regional conservation officer)

Old crow section:
I. McDonald (data)
D. Frost
J. Peter
L. Sumi
B. Troke

Peel drainage:
M. O'Donaghue (data)
S. Nielsen
K. O'Donovan
T. Pretzlow

Yukon River drainage and southern lakes:
D. Mossop (data)
B. Charles (student assistant)
B. Dobrowolsky

Survey dates, 2010 Peregrine Falcon survey:

North Slope outside national park:	July 19
North Slope , Ivavvik Park:	July 28
Porcupine Drainage:	July 6-16
Old Crow Drainage:	July 20-25
Peel Drainage:	July 6-16
Upper Peel:	July 20
Yukon River:	July 1-15(2009)
Southern Lakes:	June 28-July2

3.0 RESULTS, CURRENT POPULATION STATUS

*** Values marked are calculated with data from previously known sites only. Newly discovered nest sites are included in calculation of number of young produced.**

TUNDRIUS RACE (North Slope: F.p. tundrius)

History: Locally extinct by 1980, this subpopulation saw captive bred young reintroduced 1983-85. One pair established in 1990; by 2005, 18 pairs were observed.

Pairs 'known' pre-decline: 15

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	16	4	5(31%)	4(25%)	1.6±1.1
2005	24	6	13(54.2%)	9(37.5%)	2.6±0.84
2010	**25**	**6**	**12(48%)**	**6(24%)**	**2.8±0.8**

The 2010 survey was 78% of the known breeding population (of 40 known sites, 31 were visited)

ANATUM RACE: (South of the North Slope)

a) Porcupine drainage:

History: This group declined in the late 1960's but retained a Remnant; it was the first group to begin recovery (Hayes and Mossop 1982). It has increased steadily at about 6% annually.

Pairs known pre-decline: 21
Total pairs estimated by 2005: 30

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	36	9	26(72%)	14(38%)	2.1±0.9
2005	37	3	27(73%)	12(32%)	2.1±0.8
2010	**47**	**1**	**39(83%)**	**17(36.2%)**	**2.4±0.7**

The 2010 survey was 91% of the known breeding population (of 53 known sites 48 were visited.)

b) Peel River drainage:

History: The group declined in the 1960's but retained a remnant; it slowly increased to 1990 then doubled by 1995; the productivity of this group was the lowest of all the subpopulations in 2000, improving slightly in 2005.

Pairs known pre-decline: 12
Total pairs by 2005: 51

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	36	3	19(53%)	10(30%)	1.2±0.6
2005	28	4	18(64%)	9(32%)	1.2±0.4
2010	**23**	**2**	**18(78.3%)**	**13(56.5%)**	**2.0±1.0**

The 2010 survey was considered only 36% of the known breeding population (of 70 known sites 25 were visited).

c) Yukon River drainage:

History: This group declined through the early 1970's; by 1978 only one occupied nest site was known. Captive-bred young were fostered 1978-92; a strong and sustained recovery has occurred since.

Pairs known pre-decline: 13
Pairs estimated in 2005: 77

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	53	3	43(81%)	22(41%)	3.1±1.0
2004	62	22	55(86%)	37(60%)	1.4_0.6
2009	**62**	**1**	**41(66.1%)**	**26(41.9)**	**2.1±1.1**

The 2010 survey coverage was 72% (of 88 known, 63 were visited).

c) Southern lakes:

History: The few known breeders in this group disappeared in the 1970's; in 1990 the group was determined to be extinct; in 1995, one pair was found. Just that one pair was observed in 2000.

Pairs known pre-decline: 3
Pairs known in 2005: 2

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	2	0	1(50%)	0	--
2005	2	1	1(50%)	1(50%)	?
2010	**3**	**0**	**2(66.7)**	**0**	**?**

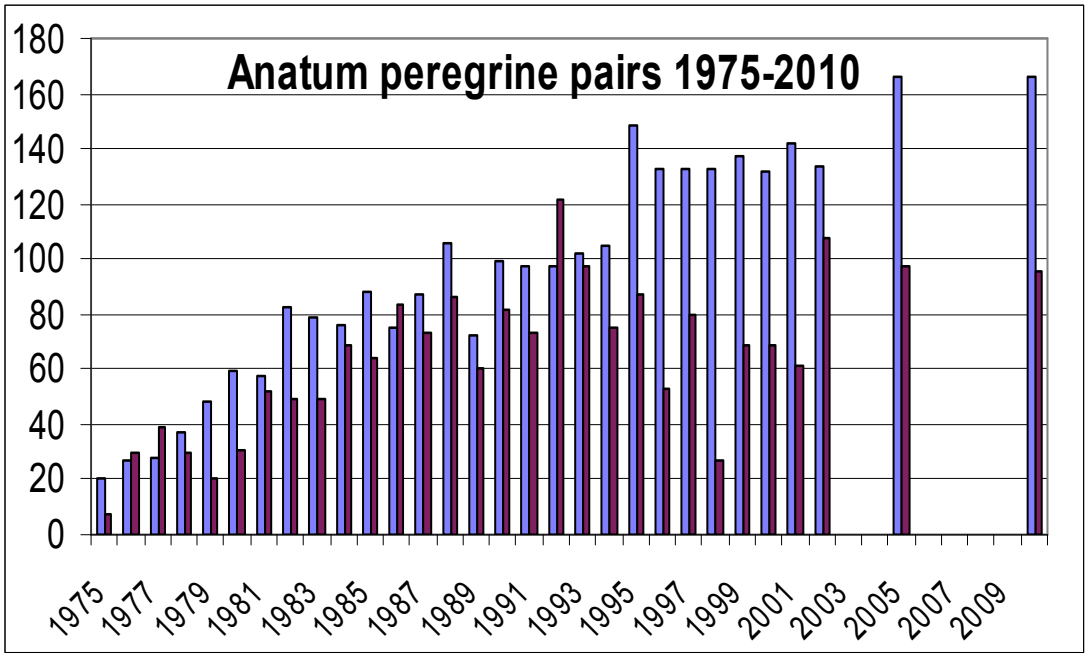
Coverage was 100% of known sites.

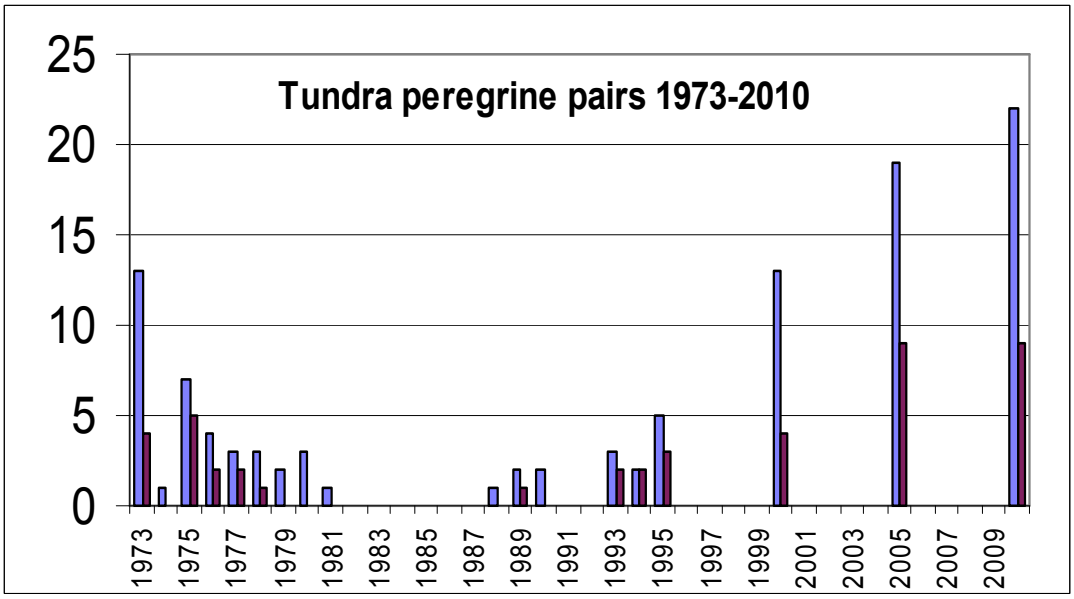
4.0 RESULTS SUMMARY:

Sites checked	New pairs	*Occupied	*Productive	Young/ Productive nest
tundrius:				
2000: 16	4	5(31%)	4(25%)	1.6±1.1
2005: 24	6	13(54%)	9(38%)	2.6±0.8
2010: 24	**6**	**12((48%)**	**6(24%)**	**2.8±0.8**
anatum:				
2000: 127	15	89(70%)	46(36%)	2.3±1.5
2004/5:129	30	101(78%)	59(46%)	1.48±1.3
2009/10:136	**4**	**100(74.1%)**	**56(41.5%)**	**1.4±1.1**

* Sample sizes shown and rates calculated do not include newly discovered nesting pairs from that year's survey.

Figure 2: Light lines show number of pairs in the surveyed areas; dark lines show number of pairs producing young.





5.0 Conclusions, future plans:

The pooled sample of tundra and *anatum* nest sites visited was about 67% of the known sites. In total 170 nest sites were surveyed, – 161 'previously known' sites. (This compares well with the 162 sites visited in 2005.)

Among the anatum grops, based on finding only 4 new nesting pairs, population numbers have apparently either ceased to increase or has greatly slowed its increase. Previously, the *anatum* group was increasing by about 20% between surveys up to 2005. The *tundrius* group was almost doubling between 5-year surveys. In the current survey the number of productive pairs recorded in this group stayed stable although 6 pairs occupying new sites were identified suggesting the population is probably still increasing (possibly 18%).

All of the subgroups now contain many more breeding pairs than were known before the decline. In total the numbers of *anatum* Peregrines is in the order of two to three times the 'known historic' population and numbers apparently continue to climb. The North Slope has about double the known pre-decline population.

Estimating from the 'known' breeders in our sample, the population in the habitat surveyed is about 167 pairs in the *anatum* groups and 19 pairs in the *tundrius* (Figure 2). Further expanding these estimates by the amount of known occupied but un-surveyed habitats, (in particular the large Pelly and Stewart river watersheds) at least 200-250 pairs are probably now occupying Yukon breeding habitats. A non-breeding segment of at least that number undoubtedly also exists.

The finding in 2000 that the *anatum* overall population performance seemed to have faltered significantly, continued but far less severely. Both occupancy at 'established' nest sites and production of young apparently recovered more toward the long term. Just over 42% of nest sites visited produced young, an improvement of about 10% over 2000 (but still about 20% below the long term average.) Total annual production of young (84 young, 102 pairs)is still below 0.9 per pair occupying nest sites, a value usually seen as borderline to poor in a stable population, (Ratcliff, 1980). How these sub-populations are maintaining themselves and in some cases continuing to increase, is an interesting mystery.

The Monitoring effort: The Yukon has continued to muster enough effort for at least some annual monitoring of segments of its Peregrine populations. This species has emerged as perhaps the best known 'mine canary' -- in 'harm's way' where things like persistent pesticides in large continental food webs are concerned. Its population performance, relatively easy to monitor, is undoubtedly equally sensitive to other global changes. The vision is to continue this effort as long as resources allow.

Population research: In press is a paper publishing a portion of MSc research into the the apparent collapse in production of young, noted in 2000. (In press, Journal of Raptor Research, March 2011 -- R.Dawson, D.Mossop, B.Boukall: 'Prey use and selection in relation to reproduction by peregrine falcons breeding along ghe Yukon River, Canada').

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