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# 2015 POPULATION STATUS OF THE PEREGRINE FALCON IN THE YUKON TERRITORY

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## **1.0 INTRODUCTION**

This survey is the Yukon portion of the Canada-wide periodic monitoring of the status of the Peregrine Falcon. Historically, in the Yukon 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 2015 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, 2014).

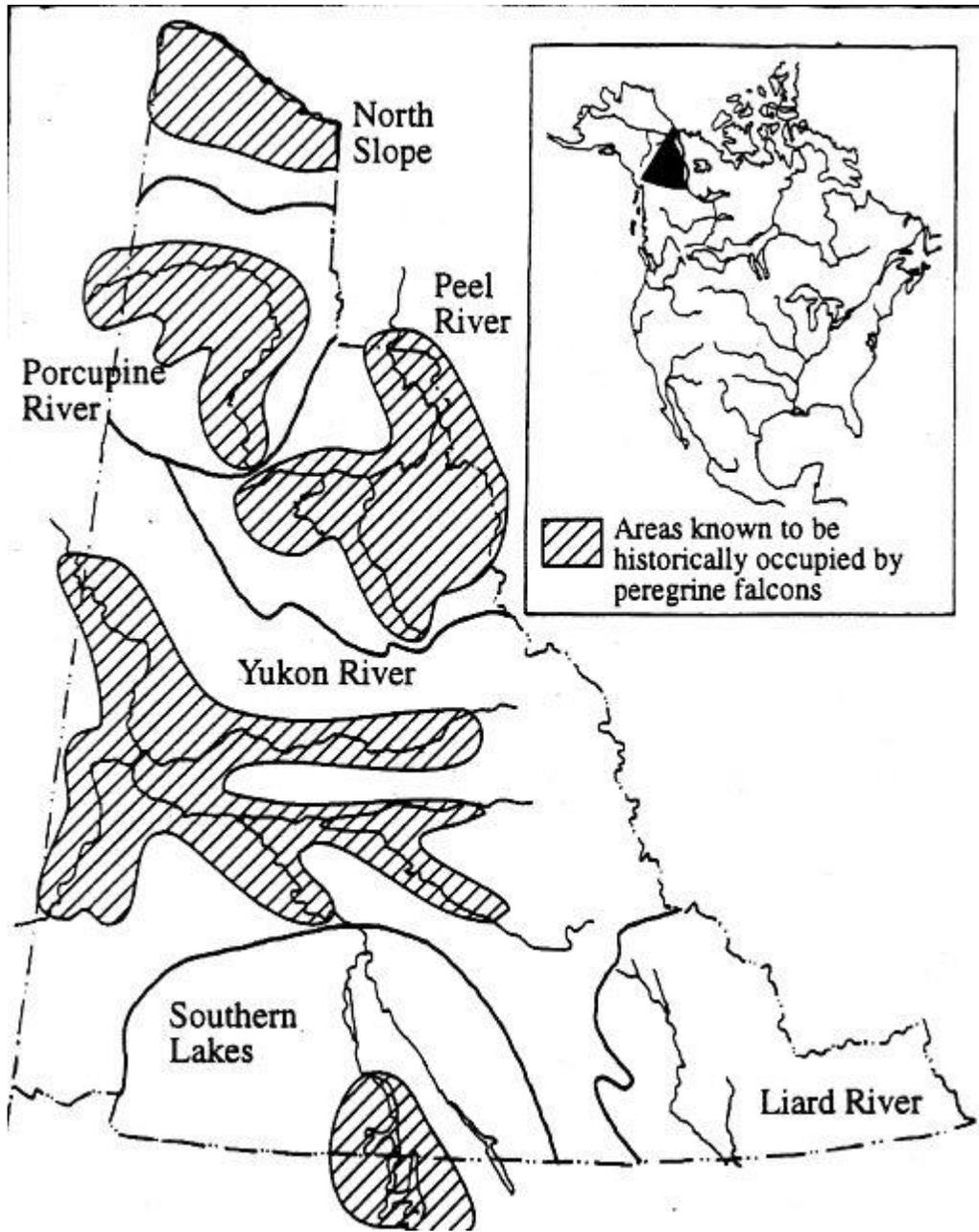


Figure 1. The Yukon Territory's major drainage basins and the five Peregrine Falcon sub-populations surveyed.

## 2.0 THE SURVEY

The methods of the 2015 survey were as close as possible to a repeat of earlier surveys -- an intensive standardized survey of representative portions all 5 known occupied drainage basins. Fieldwork was conducted in July working from south to north timed when young and defensive adults were most obvious. All survey was systematic search of riparian cliffs. By far the majority of survey was conducted from the ground by boat. On the arctic slope, all survey was conducted with helicopter. Survey was designed to depend on the fidelity of peregrines to former nest sites. Most nest sites were visited only once.

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, adult behavior, and when possible, the location of the nest ledge, number of young, and age of young. In rare 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:**

Three survey teams totaling 12 field workers, conducted the survey.

#### North Slope:

- D. Mossop (data)
- T. Jung (YTG environment)
- J. Fransen (Parks Canada)

#### Porcupine drainage:

- D. Mossop (data)
- S. VanDelft (Student Assistant)
- C. Nukon (VGFN citizen)
- P. Able (VGFN citizen)

#### Peel drainage:

- H. Milligan (data)
- P. Sinclair
- S. Stotyn
- M. Svoboda
- L. Menell
- J. Pangman

#### Yukon River drainage and southern lakes:

- D. Mossop (data)
- S. VanDelft (student assistant)

### 3.0 RESULTS, CURRENT POPULATION STATUS

\* Values marked are calculated with data from previously known sites only. Newly discovered nest sites are included only 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 2010, 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 $\pm$ 1.1
2005	24	6	13 (54.2%)	9 (37.5%)	2.6 $\pm$ 0.84
<b>2010</b>	<b>25</b>	<b>6</b>	<b>12 (48%)</b>	<b>6 (24%)</b>	<b>2.8<math>\pm</math>0.8</b>
<b>2015</b>	<b>36</b>	<b>1</b>	<b>19 (53%)</b>	<b>6 (17%)</b>	<b>3.5<math>\pm</math>0.5</b>

The 2015 survey was 86% of the known breeding population (of 43 known sites, 37 were visited)

NOTE: This sub group was completely extirpated and interestingly, is now re-establishing in apparently new habitats. Because of this it is probably not logical to compare its recovery according to the historically occupied nest sites. (The 'new' population is using habitat much closer to the ocean edge than was known originally.)

Adjusted estimates:           Occupancy: 63%  
  Productive: 25%

**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

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	36	9	26 (72%)	14 (38%)	2.1 $\pm$ 0.9
2005	37	3	27 (73%)	12 (32%)	2.1 $\pm$ 0.8
<b>2010</b>	<b>47</b>	<b>1</b>	<b>39 (83%)</b>	<b>17 (36.2%)</b>	<b>2.4<math>\pm</math>0.7</b>
<b>2015</b>	<b>48</b>	<b>4</b>	<b>43 (89%)</b>	<b>18 (40%)</b>	<b>1.0<math>\pm</math>0.9</b>

The 2015 survey was 79% of the known breeding population (of 61 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 by 2010.

Pairs known pre-decline: 12

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	36	3	19 (53%)	10 (30%)	1.2 $\pm$ 0.6
2005	28	4	18 (64%)	9 (32%)	1.2 $\pm$ 0.4
<b>2010</b>	<b>23</b>	<b>2</b>	<b>18 (78.3%)</b>	<b>13 (56.5%)</b>	<b>2.0<math>\pm</math>1.0</b>
<b>2015</b>	<b>20</b>	<b>2</b>	<b>13 (68%)</b>	<b>8 (42%)</b>	<b>2.7<math>\pm</math>0.6</b>

The 2015 survey was considered 29% of the known breeding population (of 70 known sites 20 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

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	53	3	43 (81%)	22 (41%)	3.1 $\pm$ 1.0
<b>2004</b>	<b>62</b>	<b>22</b>	<b>55 (86%)</b>	<b>37 (60%)</b>	<b>1.4<math>\pm</math>0.6</b>
<b>2009</b>	<b>62</b>	<b>1</b>	<b>41 (66.%)</b>	<b>26 (42.)</b>	<b>2.1<math>\pm</math>1.1</b>
<b>2015</b>	<b>42</b>	<b>0</b>	<b>22 (52%)</b>	<b>12 (29%)</b>	<b>1.7<math>\pm</math>0.6</b>

The 2015 survey coverage was 45% (of 94 known, 42 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 2015.

Pairs known pre-decline: 3

Year	Known Sites Checked	New pairs	*Occupied	*Productive	Yn/ productive pair
2000	2	0	1 (50%)	0	--
2005	2	1	1 (50%)	1 (50%)	?
<b>2010</b>	<b>3</b>	<b>0</b>	<b>2 (66.7)</b>	<b>0</b>	<b>?</b>
<b>2015</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>?</b>

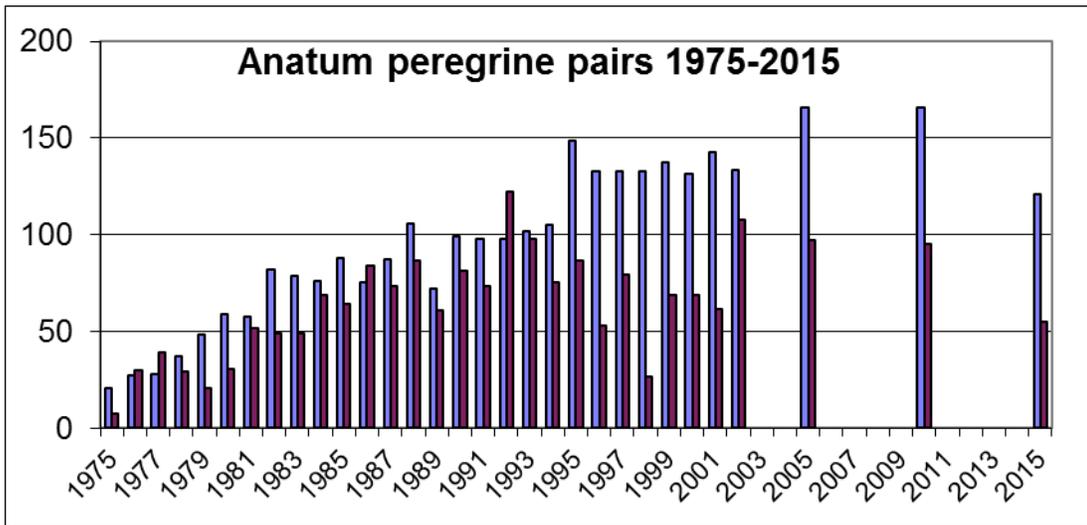
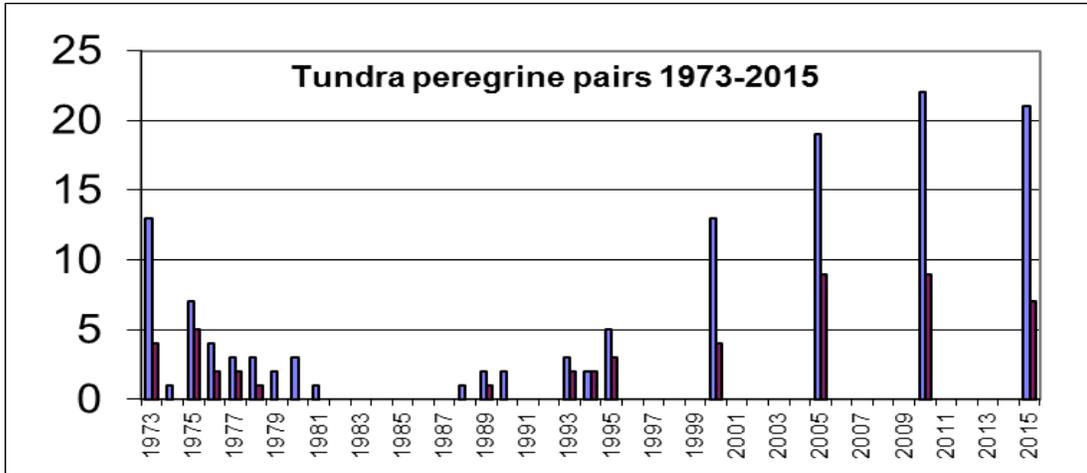
Coverage was 30% of known sites.

**4.0 RESULTS SUMMARY:**

	Nest Sites checked	New pairs	*Occupied	*Productive	Young/ nest
<b><u>tundrius:</u></b>					
2000:	16	4	5 (31%)	4 (25%)	1.6+1.1
2005:	24	6	13 (54%)	9 (38%)	2.6+0.8
<b>2010:</b>	<b>24</b>	<b>6</b>	<b>12 ((48%)</b>	<b>6 (24%)</b>	<b>2.8+0.8</b>
<b>2015:</b>	<b>36</b>	<b>1</b>	<b>19 (53%)</b>	<b>6 (17%)</b>	<b>3.5+0.5</b>
<b><u>anatum:</u></b>					
2000:	127	15	89 (70%)	46 (36%)	2.3+1.5
2005:	129	30	101 (78%)	59 (46%)	1.5+1.3
<b>2010:</b>	<b>136</b>	<b>4</b>	<b>100 (74%)</b>	<b>56 (41%)</b>	<b>1.4+1.1</b>
<b>2015:</b>	<b>152</b>	<b>6</b>	<b>79 (54%)</b>	<b>40 (27%)</b>	<b>2.4+0.8</b>

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

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



**5.0 CONCLUSIONS, future plans:**

The pooled sample of *anatum* nest sites visited was about 63% of the known sites. In total 152 nest sites were surveyed, - 145 'previously known' sites. (This is about 20 fewer than in 2010.)

Among the *anatum* groups, a decline in occupancy of about 20% is suggested. (This, in spite of finding 6 new nesting pairs). The suggestion is that population numbers may possibly have either ceased to increase or have in fact, either begun to readjust to a lower stable level or regrettably may be into another long term decline. Previously, the *anatum* group was increasing by about 20% between surveys up to 2005.

The *tundrius* group was previously almost doubling between 5-year surveys. In the current survey the number of productive pairs recorded in this group stayed stable. Only 1 pair occupying a new sites was identified.

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. 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 140 pairs in the *anatum* groups and 20 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 suggestion (as early as 2000) that the *anatum* overall population performance seemed to be faltering significantly, has continued and worsened since. In 2015 both occupancy at 'established' nest sites and production of young have apparently dropped further below the long term. Just over 27% of nest sites visited produced young, a drop of about 20% over 2010 (and also about 20% below the long term average.) Total annual production of young (79 young from 145 pairs) is well 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 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.

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