

THE CROW FLATS WETLAND
EVIDENCE OF CHANGING ECOLOGY



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INTERIM REPORT

The Crow Flats Wetland is by far the largest and important wetland complex in the Yukon. Two major sources for understanding the ecology of natural areas like the flats suitable for producing

long term management goals are technical wetland analysis as reported here, and local traditional knowledge of the elders of the First Nation.

This report is focussed mostly, but not exclusively, on the portion contributed by the former. The Flats was the subject of initial reconnaissance research in the mid 1970's, by the author (then in the employ of the Yukon Government) and members of the VGFN. At that time a series of data bases were established documenting many key ecological indicators of the functioning of the flats (See Appendix 1 and Yukon Waterfowl Management Plan, 1985, 1990).

In 2012 the Vuntut Gwitchin government requested and submitted funding proposals for a return to those earlier data sets to discover whether changes that local people on the land are reporting could be substantiated analytically.

Far-northern systems are known to be experiencing dramatic, often alarming, changes apparently due to global environmental trends. The water birds and all riparian species of the Flats potentially provide a powerful 'focus' for tracking these changes. They are totally dependant on the functioning of the wetland ecosystem; understanding their relative abundance, productivity and general use of the area gives a good ecosystem-level tracking of the critical features of the area.

OBJECT:

This survey was largely designed to document changes over the last approximately 40 years. Field work was made to mirror as closely as possible the work done in the mid 1970's. Virtually all work was ground, and water based in the area of the flats where that earlier work was conducted.

Key has been documenting timing of events -- breeding chronology in particular, but also including observations of plant phenology events and hydrological events. A running tally of species diversity similar to that collected earlier was also seen as key.

FIELD METHODS:

A field camp was established in the wetland at Schaeffer Lake, the approximate centre of the Flats where the earlier work was also centered. There were two field sessions in 2012: (June 7-20 and July 4-17); a 4-person crew.

The area around base camp became the core study area for the initial study period following which a canoe survey across the southern Flats to the village of Old Crow was used for a more extensive survey.

STUDY TEAM, EDUCATIONAL OUTREACH: An integral part of the work has been to involve VGFN students in the work. On each field session two Old Crow students were directly involved. Their assistance and enthusiasm is acknowledged. Erin Linklater and David Frost were the initial team, C. Charlie and Darcie Josie were the second. There was from the inception an objective for creating a legacy of science to integrate with the strong local knowledge of the Flats in Old Crow. Yukon College student Shannon Harvey added to this, providing keen observation skill and energy to the mix.

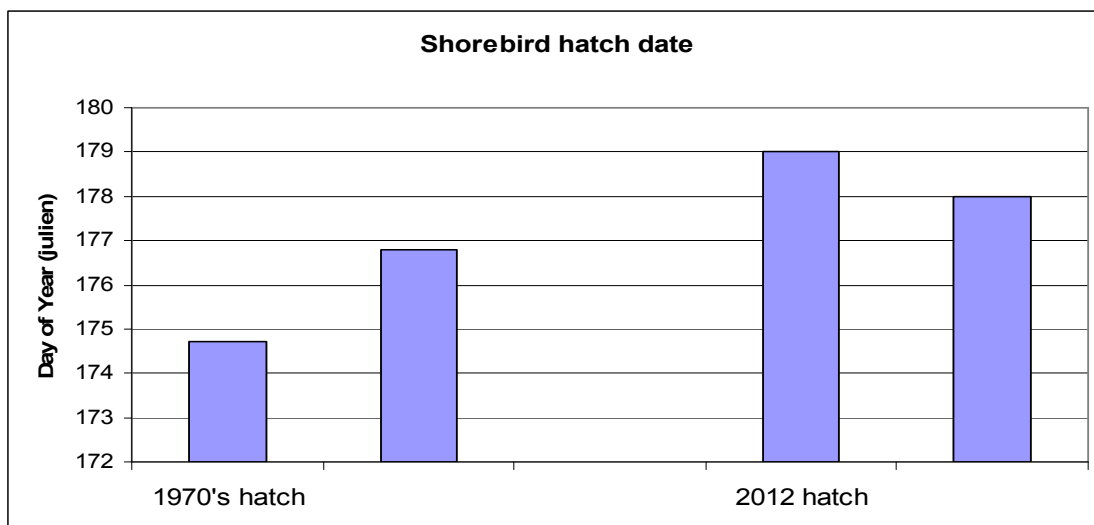
DATA, OBSERVATIONS

a) Focal species:

Birds of Prey: (The best historic data Peregrine Falcon, Bald Eagle, Osprey) In 2012 the Peregrine falcons of the Old Crow River were surveyed by boat in both study periods. Occupancy and productivity data: 10 nest sites

Gulls and shorebirds: (Historic data: about 41 breeding records). In 2012 we recorded 25 nesting records.

Initial analysis suggests no change in timing (or perhaps a later hatch) but Sample size is too small for definitive conclusions:

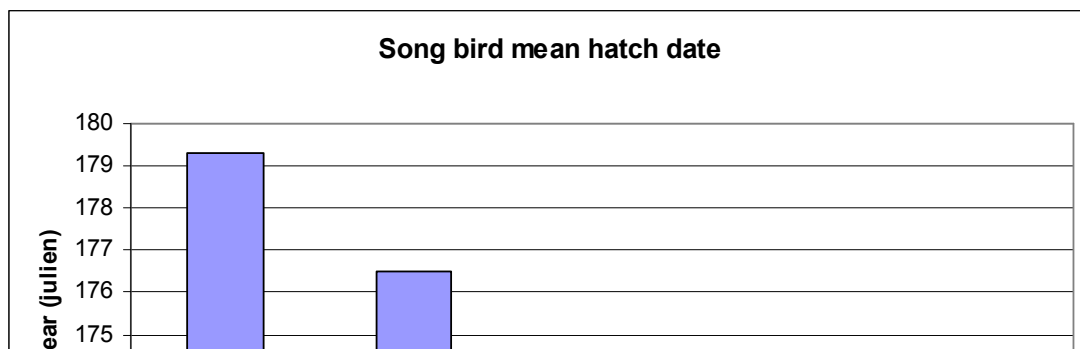


Some observations suggest that Herring gull in particular may be a species that has increased in abundance on the Flats. One nesting colony seems to have increased by about 25% in it will be important to continue to track this possible trend. Herring gulls are known to be very effective predators of young water birds, and are being artificially benefited by people.



Herring gull at Drowned lake nesting colony, OCF
Riparian song birds: (Historic data provide an excellent view of basic community structure at center of Flats and a sample size of 121 nest sites)

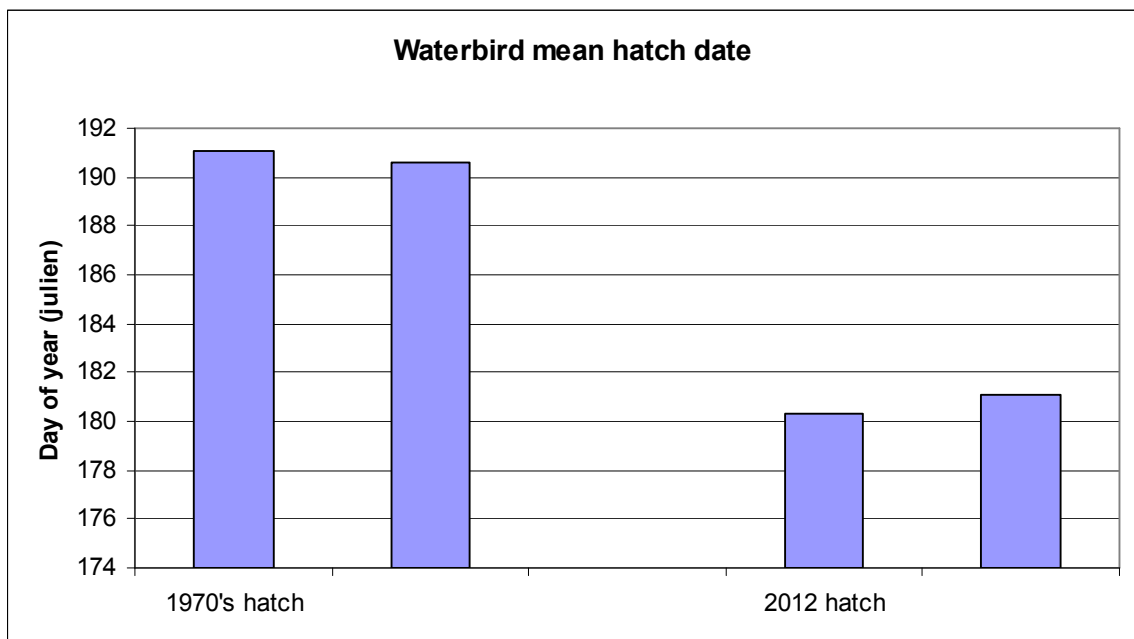
In 2012 we conducted a running count of species diversity, mapped the nesting pairs in the core area at the Schaeffer lake camp survey plot and accounted for a sample of 21 nest sites observed. Initial analysis suggests a significant change in nesting chronology toward an EARLIER hatch date:



Waterfowl: (Historic data contains total counts of pairs on specific ponds, plus a sample of 1,049 breeding records.)

In 2012 ground counts of nesting habitat and extensive Brood counts produced a sample of 60 breeding records that could be compared to earlier data. Total counts of breeding pairs produced only very small sample sizes and will await later additional counts.

Initial analysis suggests a significant change to an earlier hatch:



b) Vegetation phenology: (Historic data on 9 key species.) The same species were followed in 2012:

- Labrador tea
- Andomeda
- Dwarf birch
- Black Spruce
- Cotton grass
- Leather leaf
- Colts foot
- Cloud berry
- Aquatic sedge

(No clear conclusions are possible with this single year comparison, -- at least another year's observations needed.)

Strong observational evidence exists that riparian shrubs and spruce seem to have been 'released', and now are in accelerated growth, standing significantly higher than historically.

c) Species diversity: (Historically, a running count of all species encountered.) In 2012 a similar log was kept. Although it is too early to make definitive conclusions, several interesting and potentially alarming observations are evident:

Species missing: in 2012 species that were recorded as 'common' historically but either very rare or missing completely in 2012:

- Red-throated loon
- Greater scaup
- Long-tailed duck

d) Physical environment: (Historical data collection from research campsite was water temperature and water level changes over the summer period. A summer weather station was also operational. Recorded were: twice daily temperatures, maximum and minimum, precipitation and notes on cloud cover.)

In 2012 during the approximate 1 week periods at the Schaeffer site, the same standard weather data were taken. No clear conclusion about change is possible with the current data.

FOCUS FOR ONGOING FIELD PROGRAM:

Clearly this initial year has suggested interesting ecological changes occurring on the Flats. The value of historic data in quantifying those changes is obvious. However, in all cases this initial year has produced only minimal sample sizes for drawing sound conclusions.

- Planning must be toward continuing this work and focussing on duplicating the best of those data sets. Timing of events, in particular breeding chronology of the various groups of bird species is a key focus. Plant phenology should probably be given more emphasis than in 2012.
- Waterfowl breeding data is one of the most powerful indicators of wetland ecosystem integrity. Pair counts and brood counts are standard in waterfowl management procedures and give a good method for comparing across time as well as between wetlands elsewhere. It will be important standardize those counts, targeting lakes that were best monitored in the historic field work. (Schaeffer Lake, D.Lord lake and Drowned Lake are key.)
- Simple species diversity data may be the best and easiest data set to maintain. Song bird diversity, in particular at the Schaeffer Camp, was a strong data set historically and should continue to be a focus.

MISSING SPECIES, SPECIES AT RISK: Building on the 2012 findings, one of the alarming observations was the almost complete disappearance of some of the common species historically. In particular, Greater Scaup, Long-tailed duck and Surf Scoter have apparently declined significantly. Other species may also be found declining as the work continues.

- This has to lead to an increased focus on species becoming at 'risk'. It is known that some species in the area (notably Peregrine falcon) have in the past been 'in harms way' and almost extirpated completely.
- It is hard to know how to respond to species disappearance except to increase vigilance where those identified as declining are concerned. In continuing it will be important to revisit sites where it was known historically that, for example, long-tailed ducks and Greater Scaup were nesting. One of the best data sets of any bird is that for the Peregrine falcon. The Old Crow river breeding population, dependant as it undoubtedly, is on the water birds of the Flats, is an obvious key indicator species. A greater emphasis on its breeding ecology will be an easy addition to

the project. A general focussing on others known at risk: Rusty blackbird, Short-eared owl.

VEGATION CHANGES: A startling observation (supported locally) was the apparent 'release' of shrubs and stunted black spruce.

- Recover and locate on the ground, historic photographs of shoreline vegetation
- Make companion photos and measurement
- Record growth (ring and stem) growth

PHYSIOGRAPHY, POND DYNAMICS, HYDROLOGY: In 2012 it was relatively clear that water level in many key lakes in the central flats are higher than historically. Why this may be the case and what the consequences will be is undoubtedly of major importance to the ecology of the area.

- Engage hydrological expertise in the project
- Design and implement monitoring protocols

COMMUNITY BASED MONITORING: The importance of long term monitoring of ecological processes is central to the conclusions from work like this project. People on the land with clear, analytical protocols for tracking changes are in the best position to create the data sets necessary.

- In consultation, design clear, simple protocols for local people to track key focal indicators. In all cases of the focal species and processes the project identifies as key, thought must go into creating those protocols.
- Data bases need to be designed and maintained as a matter of course in the VGFN government processes.
- Co-ordination and cooperation with ecological monitoring already underway in the Parks Canada is essential



Shannon and Erin learning about floating and sinking on the Flats.

APPENDICES

APPENDIX 1:

**THE ECOLOGY OF THE CROW FLATS: FOCAL SPECIES & Physical Env.
HISTORIC STATE OF KNOWLEDGE: D. Mossop files**

Useable data sets exist for:

Focal species:

Birds of Prey: D. Mossop (published in several reports, some published papers, 1974, to present)

best data:

Peregrine Falcon

Bald Eagle
Osprey
Gulls and shorebirds: D. Mossop (some reports 1974-77) and unpubl data
Herring gull
Mew gull

Riparian song birds:
Basic community structure at center of Flats (1975-76)
D. Mossop (unpubl)

Waterfowl:
? - present USFWS annual surveys (published in report form), 1974-76: D. Mossop and associates (published in report form)

Moose: 1974-78 Some fairly good counts that could be used to compare with recent counts to identify trend: D. Mossop unpubl data

Caribou: 1976: Important documentation of calving on the flats by the Porcupine herd. D.Mossop (report form)

Physical environment:

Hydrology:1975: Russell and D.Mossop (published)
1974-77 Water level and water temperature data set: D. Mossop Unpubl. data

Weather: 1975-78 Summer weather station: D.Mossop unpubl data

APPENDIX 2: .

Annotated List of Bird species, Crow Flats Wetland, June-July 2012

Species	% counts where observed (n=31)	Comments
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LOONS

Common loon	30(%)	Local on the larger lakes, 3-4 pairs in the area
Pacific loon	6.7	Common breeder

GREBES

Red-necked grebe	43.3	Uncommon breeder
Horned grebe	76.7	Uncommon breeder

GEESE/SWANS

White-fronted goose	75	Common breeder
Canada goose	3.3	Common breeder
Tundra swan	26.7	Comon breeder

DABBLING DUCKS breeder

Mallard	90	Common breeder
American wigeon	100	Common breeder
A. Green-winged teal	3.3	Uncommon breeder
Northern shoveler	83.3	Common breeder
Northern pintail	83.3	Common breeder

DIVING AND SEA DUCKS

Lesser scaup	2.5	Uncommon breeder
Greater scaup	--	Missing (no observations)
Ring-necked duck	3.7	Uncommon breeder
Barrow's goldeneye	3.3	Moult concentrations only
Common goldeneye	-	Rare (1-2 observations)
Bufflehead	2.7	Uncommon
Oldsquaw	--	Rare (1-5 observations)
White-winged scoter	80.0	Common breeder
Surf scoter	1.7	Uncommon 1-2 observations

Northern harrier	3.3	Un common, no nests found
(Harlan's) Red-tailed hawk	23.3	Raising young at river
Bald eagle	--	Uncommon, 3 observations,
Merlin	6.7	Uncommon

GROUSE

Spruce grouse	--	One observation
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SHOREBIRDS

Red-necked phalarope	56.7	Seen primarily in small flocks on the larger lakes,
Wilson's snipe	46.7	Fairly common, one nest
Least sandpiper	3.3	Common, few breeding records
Lesser yellowlegs	1.7	Fairly common breeder,
Spotted sandpiper	33.3	Fairly common breeder along the river and beaches of the larger lakes
Semipalmated plover	10.	Localised pairs defending were observed on less than 5 occasions

GULLS

Herring gull	10.0	Two nesting colonies known, fairly common
Mew gull	36.7	A common breeder in the larger sedge mats of the wetland, nests and young observed
Bonapart's gull	53.3	A common breeder in groups scattered throughout The wetland
Arctic tern	36.7	Common summer resident, one nesting colony

OWLS

Short-eared owl	3.3	Uncommon on the wetland, 2br pairs obs
Northern hawk-owl	1.7	Few observations, fledged immature plus adult
Great-horned owl	6.7	Two observations
Great gray owl	--	one observation
Belted Kingfisher	30.0	Fairly common along river

WOODPECKERS

Northern flicker	6.7	Fairly common, feeding young,
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FLYCATCHERS

Alder flycatcher	16.7	Rare singing in riparian shrub zone
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SWALLOWS

Cliff swallow	--	one observation
Bank swallow	3.3	Common at river

JAYS

Gray jay	3.3	Uncommon; dispersed throughout; family groups
Common raven	6.7	Unommon in small group(s),

TITMICE

Boreal chickadee	3.0	Uncommon near riparian forest stands
Black capped chickadee	2.7	

THRUSHES

Hermit thrush	3.3	Heard singing on 2 occasions
Swainson's thrush	1.7	Uncommon, river woods
Grey Cheeked thrush	33.3	Fairly common in riparian stands
American robin	60.0	Common breeder
Varied thrush	3.3	
Ruby-crnd kinglet	3.7	Uncommon in riparian stands
Bohemian waxwing	13.3	Fairly common throughout; all observations were of groups
Northern shrike	--	one observation
WARBLERS		
Orange crowned warbler	17.0	
Yellow warbler	10.0	
Yellow-rumped warbler	57.0	Common breeder
Blackpoll warbler	53.3	Singing males heard on less than 10 occasions
Northern waterthrush	20.0	Locally common in sedge marshes
Common yellowthroat	53.3	
Wilson's warbler	--	Uncommon, one observation
BLACKBIRDS		
Rusty blackbird	63.3	Common throughout the wetland
FINCHES ETC		
Pine grosbeak	--	Heard singing on one occasion
White-winged crossbill	3.3	Flocks observed on less than 5 occasions
Common redpoll	13.3	Fairly common summer resident, no breeding record
Pine siskin	--	One observation
SPARROWS		
Savannah sparrow	40.0	Common breeder near sedge meadows, nests found young being fed
White-crowned sparrow	43.3	Common breeder throughout the wetland, nests, yn observed
Am tree sparrow	56.7	
Dark-eyed junco	56.7	Common breeder, family groups observed regularly
Fox sparrow	56.7	
Lincoln's sparrow	26.7	Fairly common, singing males heard regularly
Smith's longspur	3.3	Uncommon