



P.O. Box 21072
Whitehorse, Y.T.
Y1A 6P7

email: bonnieburns@northwestel.net
Office Phone: 867-668-6838
Fax: 867-667-6956

TECHNICAL MEMO

Date: December 12th, 2012

To: Rob Carne

From: Bonnie Burns

Re: **Spring Wildlife Survey for Wind River Trail – Archer Cathro**

A late spring wildlife survey was conducted on June 6th and 7th, 2012, following the route of the Wind River Trail in anticipation of a possible upgrade to a winter only road.

The helicopter stationed at the Rau camp picked the crew up at the gravel pit located near the junction of the Keno Highway and the Hanson Lake Road.

Helicopter:	H525 (C-GFWP) Fireweed
Pilot:	Andrew Jackson
Observers:	Bonnie Burns, Marissa Hackman
Observer – Navigator:	Grant Lortie
Observation Conditions:	Excellent – clear and bright, winds light and variable
Survey Time:	June 6: 13:37 to 14:58 (first flight) June 6: 19:01 to 20:42 (second flight) June 7: 10:05 to 11:39 (third flight)
Total survey time:	4 hours 36 minutes

Introduction

The study area lies astride the boundary between Ecoregion 176 - Yukon Plateau North and Ecoregion 170 - Mackenzie Mountains, which is the transition between the taiga and boreal cordillera ecozones. A comprehensive biophysical description can be found in Smith *et al* (2004). An overview of wildlife values for this area can be found in Bleiler (2006).

This spring survey focused on the upper south McQuesten and Beaver River wetland complexes, primarily to document moose calving. Significant waterfowl values were noted.

The entire upland on which the Rau property and camp is located was contour surveyed along the subalpine /alpine transition with no significant wildlife or evidence recorded.

A flight was taken to Grey Copper Hill to confirm the recent presence of a few caribou in the area and to look at the site of a recent grizzly bear encounter.

Results

The study area falls within a highly productive wildlife region. Several species were observed over the 4.5 hour survey time. The flight track and waypoints are displayed on the attached map. Due to GPS and download issues, the track for June 7th was lost, however the waypoints marked on June 7th are indicated on the map. Some photos are also included in this memo.

Moose:

A total of 60 moose were observed over the study period (Table 1). While some effort was made to confirm the presence of a calf where a cow was located, two factors likely contributed to the lower than expected number of calves observed. Firstly, water levels were high and many cows were located in flooded high riparian vegetation or occasionally in dense climax spruce forest, thereby obscuring the observation of a calf. Secondly, moose are normally crepuscular favouring morning and night twilight hours to be found in open habitats, meadows and open water. An examination of the matrix clearly reveals the much more favourable result for the evening flight.

Regardless, this survey does demonstrate the importance of the Upper McQuesten – Clark Lakes and Beaver River Wetlands as key moose calving areas.

TABLE 1 MOOSE OBSERVED						
Waypoint	Female	Calf	Adult Male	Immature Male	Yearling	Comment
14	1					1 st flight
15	1					1 st flight
17	1					1 st flight
18			1			1 st flight
19			1			1 st flight
21	1					1 st flight
22			1			1 st flight
23			1			1 st flight
24			1			1 st flight
25	1		2			1 st flight
27	1					1 st flight
30	1					1 st flight
32	1		1			1 st flight
33	1	1				2 nd flight
36	1	1				2 nd flight
37	1	1				2 nd flight
38	1					2 nd flight
39	1					2 nd flight
40	1					2 nd flight
41	1				1	2 nd flight
43			1			2 nd flight
44	1	1				2 nd flight
47	1					2 nd flight
48	4		1			2 nd flight
49	1	1				2 nd flight
50	2	1				2 nd flight
53			1			2 nd flight
55	1					2 nd flight
56	1	1				2 nd flight
57	1					2 nd flight

TABLE 1 MOOSE OBSERVED						
Waypoint	Female	Calf	Adult Male	Immature Male	Yearling	Comment
60	1	1				2 nd flight
61			1			2 nd flight
62			2			2 nd flight
64				1		3 rd flight
67			1			3 rd flight
68				1		3 rd flight
72	1					3 rd flight
73	1	1				3 rd flight
74						2 unclassified, 3 rd flight
TOTALS:	30	9	15	2	2	2

Waterfowl:

Aerial waterfowl surveys entail quite a different survey technique and require a trained observer skill set and often ground truthing to be valid. No attempt was made to accomplish this objective on the current survey. However, several species of diving and dabbling ducks, loons, grebes and notably several pairs of trumpeter swans were observed. These wetlands are likely important seasonally to spring and fall migrants as well as providing summer breeding and rearing habitat (Blieler et al, 2006, Mossop and Sinnott, 1998, and Sinnott and Mossop, 1998).

The incidental waterfowl observations are summarized below in Table 2.

TABLE 2 WATERFOWL OBSERVATIONS		
Waypoint #	Species	Comment
16	~ 100 diving ducks	unidentified
20	Trumpeter Swan	One individual
26	Trumpeter Swan	Pair
29	Trumpeter Swan	Pair – nest on small island
31	Trumpeter Swan	Pair
35	Canada Goose	One individual
42	Trumpeter Swan	Pair
46	Trumpeter Swan	Pair – nest site
51	Trumpeter Swan	Pair
54	Trumpeter Swan	Pair – 2 nest platforms
58	Trumpeter Swan	Pair
63	Trumpeter Swan	Pair – nest on island
70	Trumpeter Swan	Pair

Raptors:

Two pairs of Bald Eagles were observed with young on a stick platform in the top of mature spruce trees at Waypoints 28 and 52.

An osprey in flight was noted at Waypoint 69.

Carnivores:

A grizzly bear was observed at Waypoint 45 and appeared to be hunting moose calves. Waypoint 75 is the location of Robin's (Archer Cathro employee from Rau camp) encounter with a female grizzly with a yearling.

A wolf was sighted at Waypoint 65.

Other Ungulates:

No caribou were sighted during this survey however the pilot Andrew Jackson identified Waypoint 71 as the location where 2 animals were seen two weeks ago, Waypoint 76 where 2 animals were sighted one week ago, Waypoint 77 where 1 animal was observed one week ago, and one animal on the morning of June 7th at 08W 0566575, 7117732, when he dropped off a crew.

Although these sightings were not made by the crew during this survey, it appears that small numbers of caribou are widely scattered to the north of the area surveyed.

Other Waypoints:

The waypoints 34, 66 and 78 are the Rau Camp site. Waypoint 59 is the outfitter camp on Kathleen Lakes.

DISCUSSION

Moose:

A further contributing factor to our finding fewer than expected calves is the well documented neonate mortality attributable to predation by wolves, and primarily both grizzly and black bear. While not demonstrated on the study area, thorough and comprehensive studies of predator-prey relationships in interior Alaska and south western Yukon clearly show the impact that predators, particularly grizzly bear, have on neonate moose (Ballard et al, 1997 and Larsen et al, 1989).

Waterfowl:

Appendix A concisely summarizes the literature on waterfowl values within the study area. The earlier 1988 work is spotty and self admittedly has short comings, but does represent a start. None of the work deals with the Beaver River wetlands immediately to the south and downstream from the Rau property. Mossop and Sinnott (1998) and Sinnott and Mossop (1998) upgrade the knowledge on McQuesten Lake and associated wetlands, but again the Clark Lakes and Beaver River complex remains unevaluated.

Aerial trumpeter swan surveys have been conducted in the McQuesten Lake and Beaver River areas every five years commencing in 1995 up to the present. Trumpeter swan status and use of these wetlands is well documented (J. Hawkings, pers. comm.).

Fish:

Department of Fisheries and Oceans (DFO), Pacific Region lists freshwater species known to occur in the upper McQuesten River system (Appendix A). An electronic data search does not

reveal DFO or YTG fisheries having done any fishery work in the middle and upper Beaver River system (M. O'Donaghue, pers. comm.).

Adult Chinook salmon have been observed in the upper Beaver River system and Dolly Varden are known from the Rackla and Beaver Rivers (A. von Finster, pers. comm.).

RECOMMENDATIONS

Aside from continuing our wildlife work, and with the recent passage of the federal Omnibus Bill notwithstanding, it is recommended that some provisions be made to address the serious information short falls on fishery and waterfowl values, particularly for the Beaver River and associated wetlands adjacent to the Rau property.

We also wish to draw attention to the concluding pages (36 to 40 inclusive) of Sinnott and Mossop 1998 (Appendix B). These sections reflect profoundly on any proposal to upgrade the Wind River Trail adjacent to the McQuesten wetlands.

REFERENCES

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- Bleiler, Lynetter, Chris Burn and Mark O'Donoghue. 2006. Heart of the Yukon: A Natural and Cultural History of the Mayo Area. Village of Mayo. 138 p.
- Larsen, D. G., D.A. Gauthier and R.L. Markel. 1989. Causes and Rate of Moose Mortality in the Southwest Yukon. J. Wild. Man. 53: 548-557.
- Mossop, D. and K. Sinnott. 1998. Survey of Wetlands in the Central Stewart River Drainage Basin, Yukon. Prepared for: Na-Cho Nyak dun First Nation, Mayo, Yukon. 23 pp.
- Sinnott, K. and D. Mossop. 1998. The McQuesten Wetland – Mayo, Yukon: An Ecological Reconnaissance using Water Birds as Indicator Species. Prepared for: Na-Cho Nyak Dun First Nation, Mayo, Yukon. 41 pp.
- Smith, C.A. S., J.C. Meidle and C. F. Roots (Editors). 2004. Ecoregions of the Yukon Territory: Biophysical Properties of Yukon Landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin. No. 04-01, Summerland, BC. 313p.

Personal Communications

Oliver Barker, Fisheries Biologist, YG, Whitehorse, Yukon.
Jim Hawkings, Biologist, Canadian Wildlife Service, Whitehorse, Yukon
Jamie Kenyon, Specialist, Conservation Programs, Ducks Unlimited, Whitehorse, Yukon
Mark O'Donoghue, Regional Biologist, YG, Whitehorse, Yukon.
Debbie Van de Wetering, Biologist, Canadian Wildlife Service, Whitehorse, Yukon
Al von Finster, Fishery Biologist, (retired), Whitehorse, Yukon

PHOTOGRAPHS

JUNE 6TH AND 7TH, 2012



Photo #1; Cow and calf, evening flight June 6th, 2012.



Photo #2; One moose in pond, June 7th, 2012.



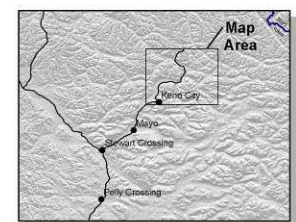
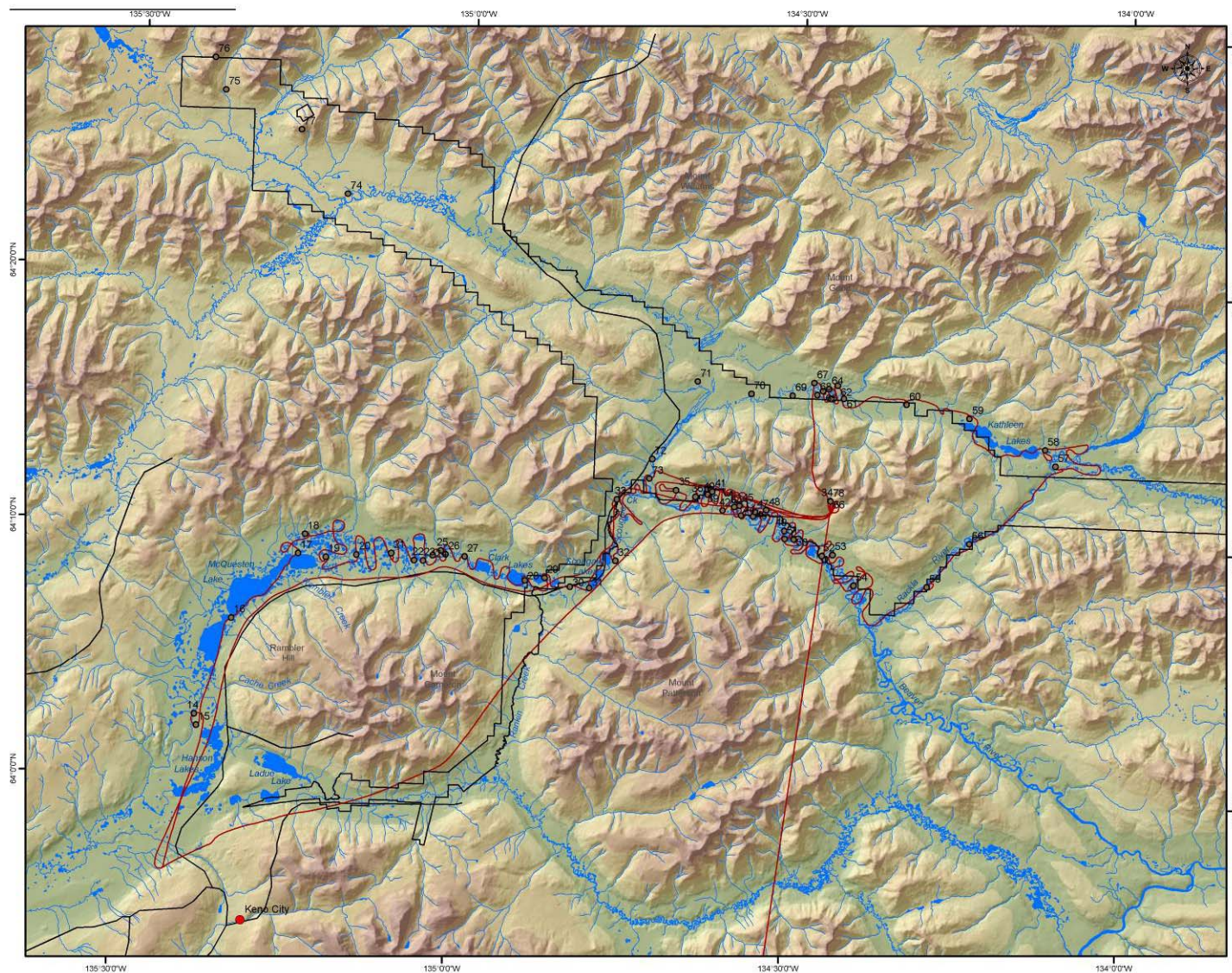
Photo #3; Excellent moose pasture in Beaver River wetlands below Rau camp, June 6th, 2012.



Photo #4; Pair of nesting swans, June 7th, 2012.

MAPS

MAP #1: Track log and waypoints

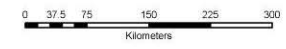


Legend

- Rau Property Outline
- Wildlife Observations
- Survey Flight Path
- Road
- Watercourse
- Waterbody

Elevation

VALUE
0 - 500
500 - 800
800 - 1,000
1,000 - 1,300
1,300 - 1,600
1,600 - 2,100
2,100 - 3,000
3,000 - 6,000



RAU PROPERTY
Yukon

June 2012 Wildlife Survey

Laberge
ENVIRONMENTAL SERVICES

Drawing prepared by K. Pelletier,
Ibex Consulting, June 2012
Scale 1:270,000 on 11" x 17" format
Wildlife Survey Data: LES (GCS_WGS_1984)
Baseline Data: <http://geogratis.cdo.gc.ca/geogratis>

APPENDIX A
WETLANDS TECHNICAL COMMITTEE SUMMARY
OF
MCQUESTEN LAKE

SITE NAME: McQuesten Lake

General Information

This area, located northwest of Mayo in central Yukon, includes McQuesten Lake, Hanson Lakes, a portion of the South McQuesten River and associated series of small ponds, and the ponds and creeks east of McQuesten Lake. Many thermokarst ponds on glacial lake sediments are found in this area (Yukon Ecoregions Working Group 2004). There are over 250 ponds in the area, ranging in size from about 0.5 to 30 hectares. The wetlands are typically marshes dominated by sedges and horsetail with adjoining shallow water areas with a diversity of aquatic plant species.

Ecosystem Function

The abundant small ponds and well-developed zones of emergent vegetation provide good nesting habitat for waterbirds, and the larger waterbodies are good for moulting and fall staging waterfowl.

Biodiversity

At least 23 species of waterfowl have been observed in the area (Sinnott and Mossop 1998; Loewen et al. 1988). Estimates from ground surveys during the breeding season suggested that a minimum of 1400 waterfowl were using the area, with Lesser Scaup and American Wigeon being the most abundant (Sinnott and Mossop 1998). During an aerial survey in early September, Mossop and Sinnott (1998) observed close to 2000 waterfowl. A spring (mid-May) aerial survey in 1988 saw 300 – 400 waterbirds on Hanson and McQuesten Lakes, but the survey was not considered adequate for identifying the area as important for spring staging relative to other areas (McEwen 1988).

A description of the wetland vegetation, an annotated list of birds, observations on amphibians, fish and mammals are provided in Sinnott and Mossop (1998). They encountered moose frequently and noted that the area was particularly well used by moose in the spring and early summer.

Fish species known to occur include burbot, arctic grayling, inconnu, whitefish species, northern pike, longnose sucker, slimy sculpin, lamprey, lake trout, and chub species¹. A logjam on the South McQuesten River has acted as an obstruction to upstream-migrating chinook salmon.

Land Status

This wetland complex is within the traditional territory of the Na-cho Nyak Dun First Nation.

Conservation Significance

Social and Cultural Significance

Sinnott and Mossop (1998) conducted interviews with elders of the Na-cho Nyak Dun First Nation and discovered that the McQuesten valley was an important travel route and hunting and trapping area, especially for moose, beaver, and waterfowl.

Referenced Sources

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Loewen, V. and J. Staniforth. 1989. Waterfowl survey flight – July, 1989. Yukon Department of Renewable Resources data file, Whitehorse, Yukon.

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Mossop, D., and K. Sinnott. 1998. Survey of wetlands in the central Stewart River drainage basin, Yukon. Prepared for: Na-Cho Nyak Dun First Nation, Mayo, Yukon. 23 pp.

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Yukon Ecoregions Working Group. 2004. Yukon Plateau-North. *In*: Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes (C.A.S. Smith, J.C. Meikle, and C.F. Roots, eds.). Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, BC, pp. 197-206.

Notes:

1. Fisheries and Oceans Canada – Pacific Region. Fisheries information summary system database: McQuesten Lake and South McQuesten River. <http://habitat.rhq.pac.dfo-mpo.gc.ca/fiss/dcf01.cfm>

Compiler and date: Wetlands Technical Committee 2010.

APPENDIX B

Pages 36 to 40 from:

The McQuesten Wetland – Mayo Yukon

An Ecological Reconnaissance Using Waterbirds as Indicator Species

By Kent Sinnott and Dave Mossop

Amphibians: Wood frog (*Rana sylvestrus*) was the only species of amphibian recorded on the wetland but their occurrence was quite wide spread and their numbers suggested a fairly common species: At 43% of ponds visited, frogs were recorded.

Fish: At 68% of ponds visited pike (*Esox lucius*) were recorded. Given the interconnected water system in this wetland it appears certain that pike and possibly other species of fish occur in virtually every waterbody.

SYNTHESIS, ASSESSMENT: Physically, the McQuesten wetland is best characterised as a flat-bottomed glacial valley with a large shallow lake and an area of mostly thermokarst ponds in the substrate. The reason the water bodies exist is a combination of substrate ice and the very flat nature of the valley floor. Combining ponds with the shallows of McQuesten Lake creates the critical "package". Impeded drainage and the rich lacustrine deposits over the base of glacial till has produced a system of high biological productivity principally in the shallow aquatic parts of the ecosystem. (Fortuitously, this NE-SW valley probably also catches and traps an inordinate amount of heat during the summer months further boosting productivity.)

An inordinately rich aquatic vegetation is at the base of the biological richness of the area. The waterbird community indicators rank the McQuesten relatively high in terms of the diversity of life it supports as well as the basic productivity it creates. (This is further underscored by high complexity at the top-of-the-foodchain -- especially exemplified by the very rich raptor population

of the wetland.) Waterbirds are principally using the system as breeding habitat; however, a feature of the wetland is the availability of on-site staging and moulting habitats which breeding birds in other wetlands often have to travel great distances to access. This "packaging" of a variety of critical habitats in the McQuesten is an important aspect to the area's ecology.

Not surprisingly, the mix of other species making up the natural community of the area is equally complex. Firstly, this wetland is unusual in the Yukon in part because of its fish populations which occur in virtually every waterbody. The McQuesten ponds apparently eventually all become connected by small drainage channels. Why this occurs is not immediately apparent but the effect is substantial. The presence of fish -- especially Northern Pike -- in all the breeding ponds should have a profound effect on the aquatic ecology of the area. (Key indicators of this are the Osprey, Bald Eagles, and the almost complete lack of the small sea ducks like Bufflehead and Barrow's Goldeneye -- which are very common on most Yukon breeding wetlands.) Diversity, notably among the dabbling ducks for example, (which is very higher on this wetland) may be a result.

The wetland vegetation community is likely also responsible for the inordinately rich large mammal populations apparent in the area. Moose and wolf populations in the area are clearly very healthy and have been a dominant human-valued resource from pre-historic times to the present. A mix of the open lake shore aquatic beds, the rich pond-based aquatics and the undisturbed, difficult to-travel wetland that probably provide escape terrain, are possibly the "package" responsible for the continuation of these valuable populations.

Conservation considerations for the McQuesten deal mostly with a system in its pristine state. Keeping it that way will be dependent on devising strategies for keeping the various basic components intact and functioning. Our work suggests the hydrologic regime is paramount; the integrity of the shallow lake/thermokarst pond complex must be maintained and human intrusions into the system cannot interfere with the unhindered use of the area by its wildlife, notably its larger mammals.

CONSERVATION RECOMMENDATIONS:

- 1) **Boundaries:** To maintain the basic integrity of the McQuesten wetland, consideration should include as a minimum, the surface of McQuesten Lake, its tributaries, and the valley floor from the Beaver River drainage to at least the south end of McQuesten Lake: (probably as a "Special Management Area" or similar designation.) Within that area key habitat sub-units should be recognised:
 - a) The shallows and narrows of McQuesten Lake, principally at its north end;
 - b) The ponds and surrounding habitat in the flat valley bottom stretching roughly from the lake narrows to the headwater lakes of the Beaver drainage;
 - c) The larger lakes within the wetland; and
 - d) Specialised breeding or nesting habitats (eg: large nest trees, cliff faces, and island habitats).
- 2) **The Aquatic regime:** The stability of the current water regime in the system should be a prime

objective of management planning. Any adjustment to the level of McQuesten Lake or its tributaries should be approached with extreme caution. Inflowing streams will have to be maintained pollution free, and the impeded flow in the valley bottom especially north of McQuesten Lake must be maintained.

- 3) **Surface disturbance:** Subsurface ice is an essential component of this wetland system. Surface disturbance of any kind in the wetland should be avoided as this would undoubtedly lead to unnatural thermokarst and potentially to the drainage or destruction of the area.
- 4) **Sensitive species:** At least half a dozen of the wildlife species in the wetland can be considered "sensitive" to human disturbance. The management strategy should be capable of limiting human disturbance to at least the current level, or these species will likely be eliminated.
 - a) Trumpeter Swan: nesting lakes are very susceptible to disturbance notably during the incubation period (May – July).
 - b) Large raptors: (Osprey, Bald Eagle, Peregrine Falcon): all require undisturbed, exclusive use of their nest sites which are re-used annually (Late April to early September). Normally a 1 km disturbance free zone has been considered essential in the Yukon (Mossop *et al*, 1978)
 - c) Large mammalian predators: (Wolf, Bear spp) interactions between people and these species invariably end by the predators losing out.
 - d) Waterfowl staging areas: the narrows and the northern shallows of McQuesten Lake are probably critical to the waterbird populations of the wetland. Disturbance could interfere with their use for moulting and pre-migrational

staging. (July through September, prolonged on site-activities should be avoided).

- 5) **Harvest access management:** Hunting (and fishing) on the McQuesten wetland will undoubtedly have to be controlled in time. Access provided by the existing all-weather road and the easily traveled lake surface makes the harvested populations vulnerable to overharvest. The Moose of the wetland are apparently particularly vulnerable when they use the lake shore and the waterfowl staging areas in McQuesten Lake could be sites of overharvest in the future. The large trophy-sized pike of the lake system are already well known.
- 6) **Non-consumptive & tourism values:** The McQuesten has two principal attractions for visitors: It offers a high diversity of wildlife species and it lies on an increasingly popular recreational canoe route. Both should be incorporated into management planning. Management of the viewing public through viewing aides (brochure, area map, improved access routes etc) will greatly enhance the value of the area for these enterprises. Clear thought should also be given to protective management for the sensitive ecological processes in the face of the potential disturbance from this activity.

LITERATURE CITED:

- Anon, 1993. The first nation of Nacho Nyak Dun final agreement between the Government of Canada, the first nation of Nacho Nyak Dun and the Government of the Yukon.
- Bond, J. 1998. Surficial geology of Mt. Haldane Keno Hill Dublin Gulch, Y.T. Geoscience maps