

A SURVEY OF BIRD USE OF
THE WETLANDS OF THE TATCHUN-TO-MINTO YUKON VALLEY



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SUMMARY:

The 48-km stretch of the Yukon Valley from the mouth of Tatchun Creek to Minto Crossing was surveyed. 110 islands, just over 50 back channels, plus 14 off-channel ponds constitute the wetland habitat most used by birds. Two key areas were groupings of islands and mid-channel bars, one near Yukon Crossing and one near the mouth of McCabe creek. We found 31 species of water birds using the area. Vegetation on river bars and islands was key. In constant successional stage, riparian willow bordered by a grass and sedge community with horsetail as the key emergent was used principally by migrating waterfowl. Breeding by waterfowl was a minor use, (5 species). A relatively dense assemblage of birds of prey indicate a highly productive area: 6 pairs of Bald eagles and 3 pairs of peregrine falcons were recorded. The inordinate mix of islands and cut off channels in the region with its obvious use by spawning salmon are key to the reason the area has such high local value. Moose, wolves, bears and a variety of small mammals along with 95 species of birds were found using the habitats of this river reach. Protecting the ecology of the area will involve maintaining the current hydrologic regime, protecting critical habitats from disturbance and avoiding contaminating the key back channels and inflow streams.

INTRODUCTION:

The Yukon River valley roughly between the mouth of Tatchun Creek and Minto Crossing (approximately 48 km) was formally identified in 2004 as valuable wildlife habitat in the 2004 Community based "Fish and Wildlife Management Plan" prepared by the Little Salmon/Carmacks First Nation, the Carmacks Renewable Resources Council and the Yukon Department of Environment. The plan was prepared pursuant to the land claim Final Agreement for the region. Several families have a long history of using the resources of the area and the management planning for the area has recognized this value in proposing a "Habitat protection area" under the Yukon *Wildlife Act*.

Bird use of the region has been suggested as part of the overall management package. Water birds and other riparian bird species are powerful 'focal' species characterizing the critical parts of the habitat that will need to be protected if the ecosystem is to continue to function in the future.

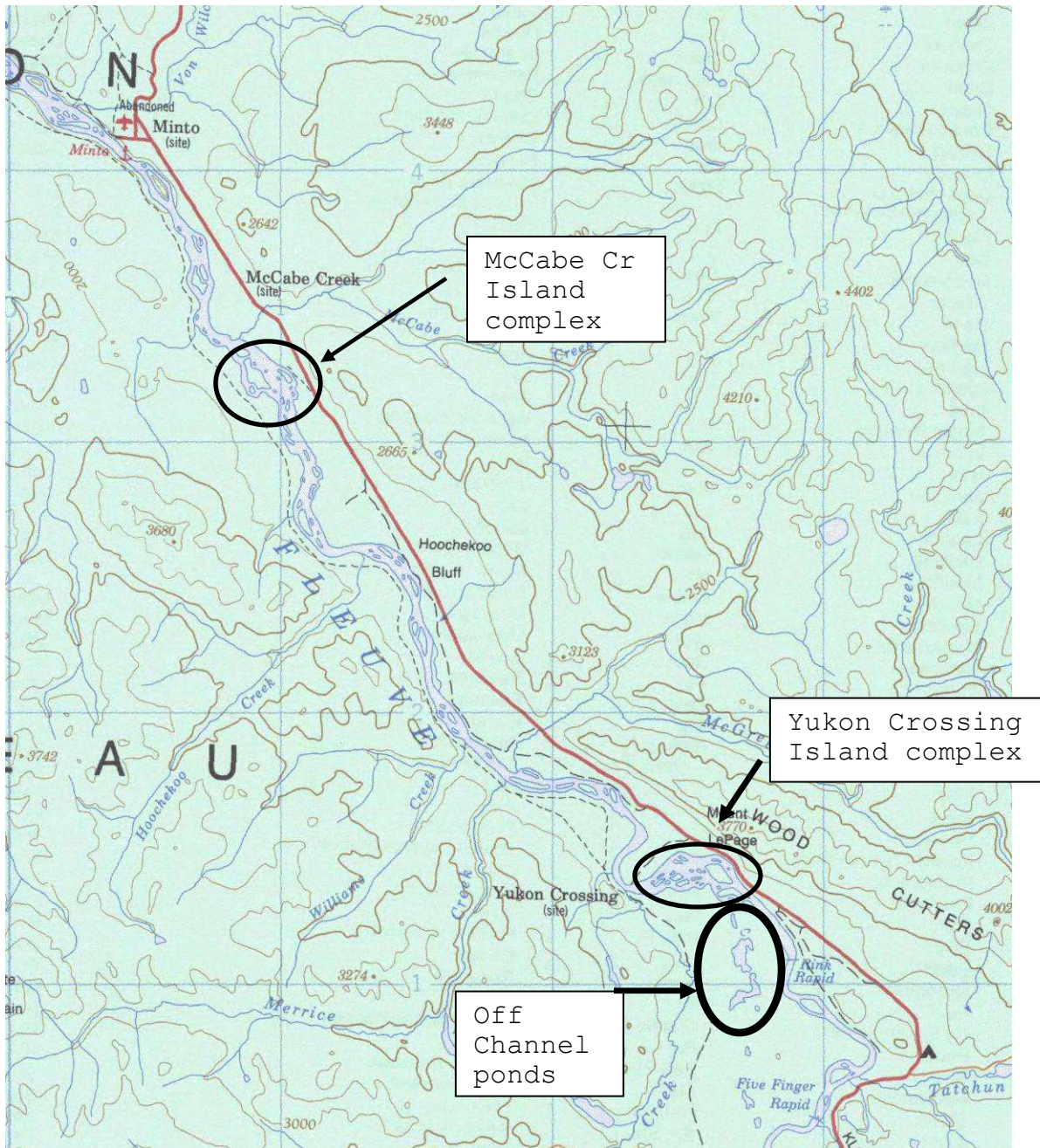


Figure 1. The location of the Tatchun Wetland study area in the Southcentral Yukon,

OBJECTIVES:

This survey was largely reconnaissance. A deep understanding of the area by the original people of the area exists. The focus of this work was to establish a baseline of science-based data to complement that historic local knowledge. Our tasks were to:

- a) Catalogue and develop a basic understanding of the formation of wetland basins;
- b) Describe generally the habitat the system provides,
- c) Quantify the populations of waterbirds and other riparian species using the wetland,
- d) Determine the life history uses made of the wetland by birds,
- e) Suggest conservation criteria for the future planning of the area.

FIELD METHODS:

In 2009, the author accompanied by various assistants made 5 field trips of one to three days each, to the study area. The first field survey was in late April before ice break up and the last was in mid October as smaller wetlands basins were first freezing over. Except during the earliest survey we worked from a base camp at the First Nation's cabins at the mouth of Tatchun Creek and used a boat to survey all back channels. We walked to wetlands not directly accessible from the river.

All species of birds were recorded and abundance was either counted directly or estimated. Riparian song birds were surveyed by counting territorial songs. Wetland habitats were characterized visually and given percent vegetative cover estimates. During the July survey we visited all water basins in the area to record water bird brood production. We surveyed by foot the group of ponds west of the river at the Rink rapids.

Birds of prey were identified and counted; breeding and/or hunting activities were recorded.

Staging water birds during migration periods were quantified by counting flocks moving through. We searched most river islands and bars for sign of feeding waterfowl (notably goose tracks and droppings).

STUDY TEAM:

Brian Charles, Yukon College student, provided summer field assistance. LSCFN members and personnel provided assistance and logistic support: Robert Moar and Mike Vance, Lands Dept. provided logistic support and passed on timely observations of bird movement in the corridor. Elder Johnny Sam who grew up in the study area was particularly helpful with local knowledge of the area and Bill Johnny, wildlife officer gave an overview of the local values currently. River rangers, Paul and Tom along with Tyrol Vance provided a valuable introduction to the river corridor by boat during the May survey. Botanist Dr W. Strong identified plants and assisted in describing plant communities.

WATER BASINS:

The water bodies producing wetland emergent and/or aquatic vegetation were of two types: a) back channels, and cut off channels or oxbow ponds of the Yukon main stem, and b) ponds associated with an apparent ancient river channel west of the current valley running roughly from above the location of the '5-finger rapids' to about 3 km below the 'rink rapids'.

Off-channel ponds: There are 14 of these latter ponds. Not connected to the main river valley, they were found to be mostly devoid of emergent aquatics with a couple of exceptions: two closest to the main valley were very productive wetlands. Probably best characterized as 'fens', these latter water bodies were supporting good sedge emergent communities well used by water birds and other riparian species.



Two ponds off the main channel had the best developed emergent vegetation community in the region.

Wetland habitats of the main channel: The main channel water bodies were by far the most common. There are just over 50 back channels and 110 islands or bars in this 48 km. section of river. No thermokarst pond formation was noted in the valley itself. Critical features of the wetland basins formed by channels of the river were the obvious annual silt deposit as well as annual ice-scour -- both of which apparently hold the system in a state of constant early succession. It is most likely that these processes are largely responsible for the high productivity of the habitats.

This section of the Yukon river valley is typical of uniquely ecologically active reaches that produce multiple mid-channel islands and bars with their associated back channels. Two good examples of these island 'complexes' are in the study section: the region immediately upstream of the location of "Yukon Crossing" and the area just upstream of the mouth of McCabe Creek (Fig 1). In these reaches the river valley opens, stream flow apparently reduces, silts are deposited and the resultant productivity of the habitat is obvious. (Locally the general area of the latter section has been known for a long time as "dog salmon slough". We found hundreds of both Chinook and Chum salmon using both this area as well as the upstream site for spawning.)



Ice scour is a major force maintaining shoreline vegetation in a productive early successional stage.

VEGETATION:

The climax off-channel vegetation is typical spruce/aspen boreal forest. On dryer sites within the wetland, in particular along the raised stream levees, white spruce dominates. This forest is clearly true 'old growth' that has been protected from renewal processes for an exceedingly long time. Extensive aspen forest also occurs, along with extensive dry bunch grass communities -- notably on south facing slopes and over areas regenerating after fire. Along the river channels and wetter sites Balsam poplar produces some of the larger riparian trees - trees especially important as nest sites for larger birds of prey.



Dry bunch grass slopes characterize much of the south facing slopes within the river valley generally.

The wetlands are basically sedge and *Equisetum* marshes and fens. Two small stands of Bulrush (*Scirpus validus*) were found but by far the dominant emergents are Sedges (principally *Carex aquatilis* and *rostrata*). Floating sedge mats are a feature of ponds with *Equisetum* occupying the deeper water sections of the mat. The channels and oxbows of the river valley itself supported a beach community of sedge and horsetail.



We found only a very few small emergent marshes beyond the beaches -- occupying standing water in cut off back channels.

The beach communities are clearly the most important habitats that were being used by waterfowl - notably geese and swans during migrational staging. In particular, the downstream ends of bars and small islands accumulate finer soil materials and often have beach communities 10 to 30 meters across. A water tolerant grass species (*Calamogrostis Canadensis*) is almost always associated with the sedge stands which makes these emergent communities somewhat different from the pure sedge stands of the more remote ponds. The horse tail species on the beaches is apparently mostly *Equisetum variegatum* (variegated horsetail) although immature specimens are very common right at the water line and may be other species. All these species but in particular the immature horse-tails were found grazed by geese. Heavy closed canopy willow stands occupy most beaches inland of the sedge.



The beach vegetation exposed during fall draw down is essential habitat for staging waterfowl. Immature Horse-tail seems to be the most important food plant.



Emergent communities on river bars are primarily sedge and aquatic grasses merging into stands of willow

Submergent aquatic communities were not found to be common in the ponds and back channels of the study area. Some very small stands of pondweed (*Potamogeton richardsonii*, *P. vaginatus*, *P. filifomis*, *P.praelongus*) were found in side channels that were protected from the river's current.

WATERBIRD POPULATIONS:

Water birds (waterfowl, gulls and shorebirds) are totally dependant on the functioning of wetland systems; their numbers as well as the life processes they display give a picture of the relative value and basic productivity of habitats.

Species Diversity:

Table 1. Relative abundance of waterbirds from all survey counts

Species	Counts					Percent in	
						Total	Total Count
Mallard	5	6	1	25	20	57	13.9
Am. Wigeon		25	31			56	13.6
Herring Gull		5		50		55	13.4
Canada Goose	11		10	25		46	11.2
Common Merganser		25	4	1	2	32	7.8
Tundra Swan					25	25	6.1

Trumpeter Swan	5	2			15	22	5.4
Bufflehead				10	8	18	4.4
Spotted Sandpiper		5	7	2	1	15	3.6
Mew Gull		10			5	15	3.6
Long-billed Dowitcher				10		10	2.4
Green-winged Teal		1	4	4		9	2.2
Lesser Scaup		5			1	6	1.5
Barrow's Goldeneye			2		4	6	1.5
Wilson's Snipe				6		6	1.5
Horned Grebe		1		4		5	1.2
Surf Scoter			4			4	1.0
Pacific Loon				4		4	1.0
Northern Pintail	2		1			3	0.7
Ring-necked duck			2			2	0.5
Harlequin Duck		2				2	0.5
White-winged Scoter			2			2	0.5
Common Loon				2		2	0.5
Red-necked Grebe				2		2	0.5
Lesser Yellowlegs				2		2	0.5
Northern Shoveler			1			1	0.2
Long-tailed Duck					1	1	0.2
Common Goldeneye		1				1	0.2
Yellow-billed Loon		1				1	0.2
Sora				1		1	0.2

We found 31 species of water birds using the riparian habitats including the ponds south of the main river valley -- (2 swan, 2 gull, 2 grebe, 4 shorebird and 21 duck species). Of these, 8 species (Mallard, American Wigeon, Herring gull, Canada Goose, Common Merganser, Tundra swan, Trumpeter swan and Bufflehead) made up 75% of the species encountered (Table 1). This diversity is similar to but somewhat above that found at other wetland complexes surveyed in the Yukon:

Peel plateau:	20 species
Mcquesten Wetland:	24 species
Horseshoe Slough wetland:	28 species
Chappie Lake wetland:	22 species
Needle Rock wetland:	25 species

(D.Mossop 2001; Sinnot&Mossop 1998; Mossop 2002; Mossop 1988)

Breeding Numbers:

During the July 1-4 survey we observed 3 waterfowl broods (one was apparently a combined brood of two Canada Goose pairs), and at least 2 grebe broods. We also found at least 14 lone adult ducks which would indicate a probable breeding pair. These numbers show the habitat definitely being used for breeding but the numbers also indicate the area is not a concentrated or 'critical' breeding habitat. Instead, it is probably best described as a typically good example of high-end riparian habitat found along sections of the Yukon river valley where back channels, bars, islands and off-channel ponds are common.

American Wigeon July 2: F + 4yn age: 1A
 Canada Goose July 2: 2P + 5+yn age: 1B
 Bufflehead July 4: F + 7yn age: 1a
 Red-necked grebe July 4: P + 3yn
 Horned grebe July 4: P + 4yn

Indicated breeding pairs:	American wigeon:	4
	Common merganser:	4
	Barrow's goldeneye:	2
	Northern Pintail:	1
	Common Loon	1
	Lesser Scaup	1
	Bufflehead	1

Moult/Brood Concentrations, Migration Staging:

By far the most important use of the area's habitats by water birds appears to be as a migration corridor. We observed movements of Canada geese, Tundra and trumpeter swans, gulls, several species of ducks and shorebirds during both early spring and late fall surveys. "Staging" (to feed and rest), we only observed in the fall. Our 'single day' surveys obviously do not give a full picture of this use of these habitats.

Flocks of waterbirds seen migrating 2009

April 21: Canada goose: 5, 20 (upstream flight)
 May 15: Mallard: 5, 15, (upstream flight)
 Yellow-billed loon: 1 (on water)
 Common Merganser: 35 (upstream flight)
 American Wigeon: 19 (on water)
 Sept 10: Canada goose: 25 (downstream flight)
 Herring gull: 250 (downstream flight)
 Long-billed Dowitcher: 25 (downstream flight)
 Unid shorebirds: 150 (downstream flight)
 Oct 9: Common Merganser: 30: (on water)
 Canada goose: 40: (downstream flight)
 Trumpeter swan: 5: (downstream flight)
 Tundra swan: 25: (downstream flight)

The fact that we did see significant movement during our short visits added to the fact that local people report large movements (and fall staging) of waterfowl, would indicate this value of these riparian habitats is potentially very important.

During our early spring visit the river was frozen and we saw no staging. In fall visits, we searched river bars and back channels for sign left behind by feeding waterfowl: goose tracks, swan tracks, droppings, grazed vegetation. We found several silt and sand bars which supported on their down-stream ends, good stands of immature horse-tail (*Equisetum spp*), being used. Both swans and geese had left sign. We observed only two flocks of waterfowl actually on the ground. We saw swans (one small group of Trumpeter swan and a larger flock of Tundra swan) plus a fairly large flock of dabbling ducks (mostly Mallard, a few American Wigeon) feeding at the river bars upstream of the mouth of McCabe creek. The river bars associated with the island development just upstream of the location of 'Yukon Crossing' were also being used but we saw no birds actually on the ground there.

It is well established that the use of staging habitats during migration often become absolutely critical in inclement weather. Fall of 2009 was inordinately mild. The critical nature of these habitats would probably be demonstrated through long-term monitoring. (Local people's observations would certainly suggest heavy use at least some years.)

Based on our observations as well as those of local people it is likely that many thousands of water birds use the Yukon river valley in this section annually and that in some years they make critical staging stops.

RAPTORS:

The Birds of Prey (eagles, falcons, hawks and owls) are powerful top-of-the-food chain indicator species for assessing the complexity and general productivity of an ecosystem. Our observations suggest a very important section of the Yukon valley. The density of key species of raptors is as high here as has been recorded in any other section the river yet surveyed.

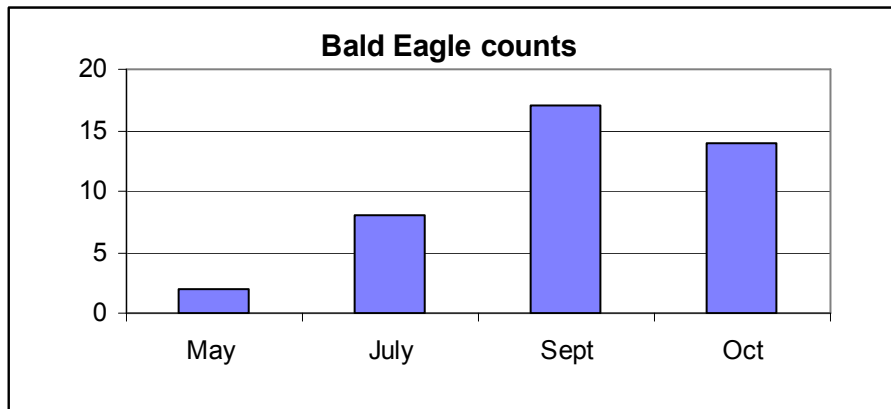
Peregrine falcon: This rare species listed as "Special Concern" in Canada has three pairs breeding in the surveyed area (Appendix 2). Their nesting requirements are disturbance-free river side cliffs, areas which should be viewed as 'critical' habitat free from all human activity. Three pairs of peregrine falcons occupying and hunting this section of valley would indicate a highly productive

ecosystem, notably of shorebirds and other water birds which form the bulk of their required food items (Boukall, 2004).



River side cliffs are critical nesting habitat for peregrine falcons; they will have to be protected from all disturbance

Bald eagle: By far the most obvious breeding bird of prey in the habitat surveyed was this species. We identified 6 nest sites (1 breeding pair per 8 km of river valley). This ranks as one of the denser breeding population in the Yukon. All nest sites were attended by adults but none of the pairs were apparently successful in the current year. Following the July visit the numbers of bald eagles began to rise markedly as Chinook salmon began to appear. On the September visit numbers peaked.





Large, very old trees of the main channel beaches and levees are critical nesting habitat for large birds of prey like the population of bald eagles of the region

Other birds of prey: We made observations of 9 other birds of prey: Merlin, Northern harrier, Harlan's hawk, Sharp-shinned hawk, Great horned owl, Hawk-owl, Osprey, Northern Goshawk and American Kestrel.

Overall the density and variety of raptorial birds was impressive; the value of these rarer birds to the visiting public as well as to managers for monitoring the health of this habitat will undoubtedly grow markedly in the future. In particular the health of the salmon spawning populations and their critical habitats will be closely tracked by the bald eagle numbers.

SONG BIRDS:

During each survey we recorded all birds seen or heard. Singing song birds were recorded at all river survey sites and lists were kept when ponds were visited. In all 95 bird species were recorded (Appendix 1). By far the most valuable habitat for

breeding song birds was the riparian shrub zone along all river channels and back sloughs. The action of ice scour and water erosion keeping this habitat in a vibrant state of regeneration is probably responsible for these birds' success.

AQUATIC MAMMALS:

Both beaver and muskrat were found in the wetlands of the area. Beaver in particular occupied at least 5 back-channels with large food caches and lodges. Muskrat were observed only once in the south ponds well removed from the river itself.

MOOSE:

Literally every river bar or beach visited had evidence of moose. Most common were tracks which were apparently of cows with calves. The suggestion is that the bars and islands in this section of river are critical spring and summer habitat for calving and calf rearing.



Virtually every beach surveyed showed moose --notably cows and calves - are present

CARIVORES:

Mustelids: Both **mink** and **short-tailed weasel** tracks were recorded on the area.

Bears: Based on track encountered on most river bars, **black bears** were a fairly common visitor to the area. Local people have recorded grizzly infrequently in the area however we encountered evidence of **grizzly** only once.



Fall river bars are heavily used by black Bear feeding principally on salmon carcasses.

Wolves were heard on one occasion; tracks were frequently found on river bars.

Amphibians: Wood frogs were observed only once at one of the ponds south of the river valley.

Fish: We found several channels and sloughs of this river reach being used by both **Chinook and Chum Salmon**. In September channels of the island group upstream of Yukon Crossing were being used by Chinook salmon. One bar had over a dozen Chinook carcasses. In October similar channels were being used by hundreds of Chum salmon. As well we observed numbers of Chum salmon at that time using at least one back channel in the island complex upstream of the mouth of McCabe creek.

This resource is undoubtedly at the base of much of the indicated productivity of the area and should be the focus of protective management literally forever.



Chum salmon carcasses are heavily used during September and October by a variety of scavenging wildlife species.

SYNTHESIS, CONSERVATION RECOMMENDATIONS:

The key features we can identify to date responsible for the continuation of this wetland ecosystem are the unique hydrologic regime, the disturbance free areas of the backchannel wetland habitat, the river-side nesting cliffs and the unique levee forests.

A) Hydrology: River flow, its annual silt deposit, draw-down and annual ice scour are all probably involved in maintaining the functioning of this system. Any disruption will likely stop river bars from building and the successional stage vegetation including the emergent sedges and horsetails will likely be adversely affected. Beach vegetation, notably horse-tail stands used by staging waterfowl are produced in water and annually are exposed by fall draw-down.

It is probably critical to protect inflowing streams from toxic materials. Agricultural and industrial run-off into these small streams is likely to flow directly into the off-channel wetlands where it could adversely affect the system's productivity.

B) Protection/critical areas: We observed no nests of geese but the nesting habitats of the broods we did see are without doubt on the mid stream river bars and small islands. (Likewise the same habitats are probably critical habitats for calving and summering moose with calves - not to mention the critical habitats adjacent for spawning salmon.) These islands and bars are some of the most critical habitats of the system.

The river-side nesting cliffs of peregrine falcons are absolutely essential for their continued use of the ecosystem. Other cliff nesting birds likewise are totally dependant on these sites being disturbance-free and protected. It will probably be essential to protect the entire riparian area of the valley if it is to continue to function in the future.

C) Old Growth forest: Large, old trees are critical nesting and perching habitat for the large population of Bald Eagles and other birds of prey in the area. These trees, protected from burning by the wetlands of the riparian area are the largest anywhere in the region. Once cut down they are not likely to be replaced in very many decades. Concerted effort will have to be exercised to protect this forest both for its use by wildlife but also because it is largely responsible for holding soil materials along various stretches of the river.

D) Monitoring: This section of river valley with its obvious and easily surveyed top-of-food-chain raptors lends itself to good annual monitoring. The eagle population and the Peregrine falcon breeding pairs can be checked periodically without causing undue disturbance. This should give a good indication of problems that may arise throughout the food chain. (Presumably monitoring the use of the area by spawning Chinook and Chum salmon will become an essential periodic activity.)

Likewise there are numerous monitoring protocols that can be used to monitor the value of the river bars and channels by staging waterfowl. (Breeding pair surveys and brood counts wouldn't likely produce useable data as the area seems to be a minor habitat for that activity.)

It seems clear that without protective management, in the face of proposed increasing human use of the area for in particular, agriculture, mining, recreational visitation and people just wanting to live on the area, the likelihood of disruptive disturbance is inevitable.

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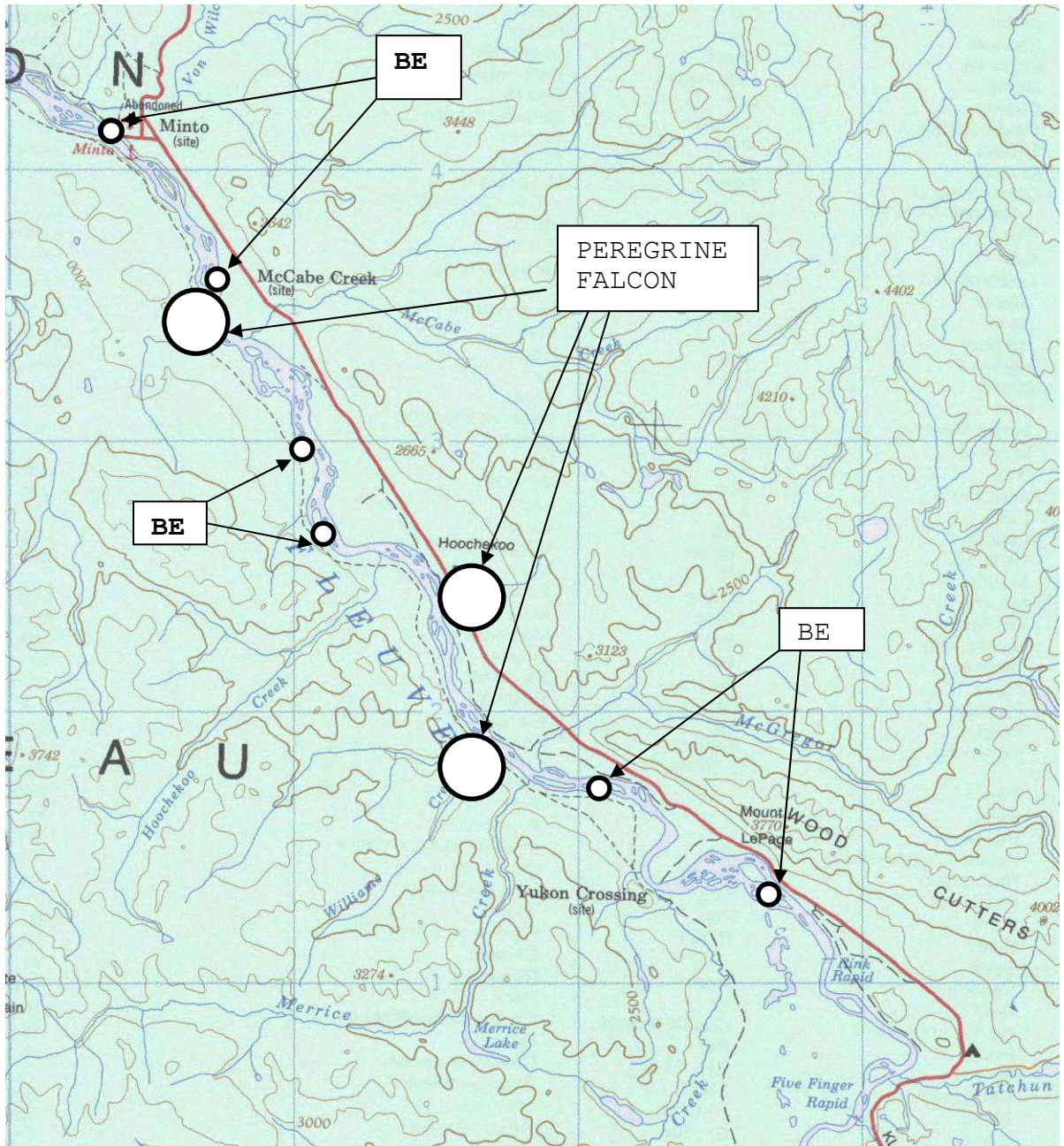
APPENDIX 1: . Annotated List of Bird species, Tatchun/Yukon wetland

SPECIES	Notes on observations
RED-NECKED GREBE	2 Breeding pairs observed on south ponds July 4
HORNED GREBE	1 pair with young on south ponds July 4
COMMON LOON	Pair on south pond July 4
YELLOW-BILLED LOON	1 adult on main river channel May 15
PACIFIC LOON	1 adult on main river channel May 15
HERRING GULL	Common over main channel all visits
MEW GULL	Common over main channel all visits as well as breeding on south ponds
BONAPART'S GULL	2 adults over south ponds..probably breeding July 4
ARCTIC TERN	1 adult on main river channel July 2
COMMON MERGANSER	Common on main channel all visits
RED-BR. MERGANSER	1 adult on river September visit
MALLARD	Uncommon except in flocks during Sept and Oct visits
AMERICAN WIGEON	Uncommon with one breeding record
AM. GREEN-W. TEAL	Uncommon, in small flocks during Sept visit
NORTHERN SHOVELER	Uncommon, in small flocks during Sept visit
NORTHERN PINTAIL	Uncommon, in small flocks during May visit
LESSER SCAUP	One small flock in Sept
RING-NECKED DUCK	One pair apparently breeding on s. ponds July
COMMON GOLDENEYE	1adult on river channel May 15
BARROW'S GOLDENEYE	Common on main channel all visits as well as breeding on S ponds
BUFFLEHEAD	Uncommon, breeding on s. ponds
LONG-TAILED DUCK	1 pair on main channel Oct visit
HARLEQUIN DUCK	1 adult on main channel during May 15 visit
WHITE-WINGED SCOTER	1 small flock May 15
SURF SCOTER	Several small flocks during all visits; main river channel
CANADA GOOSE	1 breeding record, July 3; flocks moving along main channel April, Sept and Oct visits
TUNDRA SWAN	1 flock of 20 during Oct visit
TRUMPETER SWAN	1 pair on s. ponds July 3; small group on main channel during Oct visit
SORA	1 adult heard calling, s ponds July 3
COMMON SNIPE	Common, seen or heard on all visits except May 15
LONG-BILLED DOWITCHER	1 flock of 20 during Sep visit
LESSER YELLOWLEGS	Uncommon, 3 pairs apparently breeding on S ponds, July 4
SPOTTED SANDPIPER	Common along main channel beaches as well as on S ponds
SEMIPALMATED PLOVER	1 adult on S ponds July 4
SPRUCE GROUSE	1 dead adult July visit
RUFFED GROUSE	2 drumming adults heard on July 2
NORTHERN HARRIER	Several adults seen during July visit
SHARP-SH. HAWK	1 adult crossing river July 3
NORTHERN GOSHAWK	1 adult crossing river July 3
HARLAN'S HAWK	1 adult over river July 5
OSPREY	1 adult May 15 (probably moving through?)
BALD EAGLE	Common along main channel beaches as well as on S ponds
PEREGRINE FALCON	2 pairs observed, one pair breeding
MERLIN	1 adult over river July 3

AMERICAN KESTREL	1 adult and 1 pair July 2
GREAT HORNED OWL	1 adult heard calling, July 3
NORTHERN HAWK-OWL	1 adult near river Oct visit
BELTED KINGFISHER	Uncommon along river July visit
HAIRY WOODPECKER	1 adult at Tatchun camp Sept visit
THREE-TOED WODPECKER	1 adult observed Oct visit
N.FLICKER	Common along river and around s. ponds all visits
COMMON NIGHTHAWK	1 adult over river July 3
SAY'S PHOEBE	Common near river bluffs July visit
WESTERN W. PEEWEE	1 adult heard singing at Tatchun camp July 2
ALDER FLYCATCHER	Common along river and around s. ponds all visits
LEAST FLYCATCHER	1 adult heard sining at Tatchun camp July 2
HAMMOND'S FLYCATCHER	Uncommon along river and around s. ponds all visits
BLACK-B. MAGPIE	Several adults seen during July visit
GRAY JAY	Common on all visits
COMMON RAVEN	Uncommon except during Sept and Oct visits, at least 3 nest sites
RED-WINGED BLACKBIRD	1 adult heard singing at S ponds July 4
RUSTY BLACKBIRD	Uncommon but present at 2 of the S ponds July 4, during Sept, several obs at river
PINE GROSBEAK	1 singing adult July 3
WHITE-W. CROSSBILL	1 flock near river Sept 10
COMMON REDPOLL	Common during Sept and Oct vists..flocks over river
PINE SISKIN	Singing at Tatchun camp July 2
LAPLAND LONGSPUR	Common on river bars ruing Sept and Oct visits
SAVANNAH SPARROW	2 singing adults during July 2 survey
WHITE-CRND SPARROW	Several adults seen during July visit
AM. TREE SPARROW	1 adult singing near s. ponds July 4
TREE SPARROW	Uncommon near s. ponds July 4
CHIPPING SPARROW	Common singing at most locations during July visit
DARK-EYED JUNCO	Common, feeding young, seen all visits
LINCOLN'S SPARROW	Common, seen or heard on all visits except May 15
FOX SPARROW	Uncommon, at S ponds, several obs
CLIFF SWALLOW	Fairly common over river during July
TREE SWALLOW	Fairly common over river during July
VIOLET-GREEN SWALLOW	Fairly common over river during July
BANK SWALLOW	Common over river most July surverys
BOHEMIAN WAXWING	1 flock over river during Sept visit
YELLOW WARBLER	Common breeding in riparian shrubs
YEL-RUMPED WARBLER	Common along river and around s. ponds all visits
BLACKPOLL WARBLER	Heard singing several times during July visit
NORTHERN WATERTHRUSH	Common along river and around s. ponds all visits
COMMON YELLOWTHROAT	Common along river and around s. ponds all visits
WILSON WARBLER	Uncommon along river during July
AMERICAN PIPIT	Several on river bars during Sept visit
BLACK C. CHICKADEE	Uncommon, heard near tatchun camp Sept 10
BOREAL CHICKADEE	Fairly common over river during July
RUBY-CRND KINGLET	2 singing adults during July 2 survey

TOWNSEND'S SOLITAIRE	1 adult sinnging near river bluff July 3
SWAINSON'S THRUSH	Common on all July surveys
HERMIT THRUSH	1 adult heard singing near s. ponds July 4
AMERICAN ROBIN	Uncommon, heard singing on several survey counts July 2
VARIED THRUSH	Common, singing at most locations along river July visit

Appendix 2



Critical bird of prey nesting habitats, Tatchun to Minto study area, 2009