
Sensitive Area Plan For Mugaha Marsh

Mackenzie Forest District
October 2001

Order to Establish a Sensitive Area and Objectives

File Number MOF 12550-20 Mugaha Marsh
 MELP 47000-20 Mugaha Marsh

Pursuant to Section 5 of the *Forest Practices Code of British Columbia Act*, 612 hectares of Crown Provincial forest land in the Mugaha and Tutu Creek watersheds are established as a sensitive area effective January 1, 2002

The following objectives are established as sensitive area objectives Effective January 1, 2002:

- 1) Maintain the current mix of forest and wetland habitat for resident wildlife species.
- 2) Allow for wildlife monitoring and research activities within the sensitive area that do not conflict with the other objectives.
- 3) Maintain the current range of recreational uses and opportunities.
- 4) Provide reasonable precautions for the safety of users of the area.

The boundaries of the Mugaha Marsh Sensitive Area are shown on the attached 1:50,000 scale map dated October 24, 2001.

(original signed by)



Dave Francis, District Manager
Ministry of Forests
Mackenzie Forest District



Date

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District Manager's Policy

Under Section 41(1) of the *Forest Practices Code of British Columbia Act* (the Act), I am required to approve an operational plan or amendment that has been prepared and submitted in accordance with the Act, the regulations and the standards, and that I am satisfied will adequately manage and conserve the forest resources of the area to which it applies.

I have reviewed the strategies in Section 3.0 of the Mugaha Marsh Sensitive Area Plan and believe they are relevant to, and will provide appropriate guidance in, the development of operational plans and amendments which pertain to the area covered by this plan. I therefore recommend that these strategies be considered and incorporated into operational plans and amendments where possible.

I will continue to evaluate each operational plan or amendment on its own merit prior to making a decision on whether or not it should be approved. To assist me in this process, where an operational plan or amendment does not incorporate the strategies, I will expect an adequate explanation of the circumstances which justify their omission.



Dave Francis, District Manager
Ministry of Forests
Mackenzie Forest District



Date

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Sensitive Area Plan for Mugaha Marsh

1.0 Introduction

During the recent land and resource management planning process for the Mackenzie Timber Supply Area, participants identified the Mugaha Marsh and surrounding landscape as an area of local significance for its wildlife habitat values and wildlife viewing opportunities. The Mackenzie Land and Resource Management Plan (LRMP) reflects this priority through the specific resource management zone objective for wildlife and wildlife habitat for the Parsnip Resource Management Zone, maintain habitat needs of all naturally occurring wildlife species by use of the following strategy:

“Recognize the importance of Mugaha Marsh and adjacent forest and wetlands as songbird habitat and as an important research site for landbirds, through the Sensitive Area proposal. Support the establishment of Mugaha Marsh as a Sensitive Area under the Act.”

The excellent wildlife viewing opportunities and easy access to the Mugaha Marsh area have been well known and used by residents of Mackenzie for over 25 years. For most of those years, the use has been moderate and regular. In 1992, BC Hydro's Peace-Williston Fish & Wildlife Compensation Program (PFWWCP) began a small habitat enhancement program for loons and waterfowl and in 1993 erected an interpretive sign at the site. In 1994, the Canadian Wildlife Service (CWS) and Mackenzie Fish and Game Association began a songbird migration monitoring program on this site and two others nearby. Recreational use of the area for wildlife viewing and hiking has increased in the 1990's as has industrial activity. Chico Wood Fibre Ltd. uses the existing non-status road running through the middle of the sensitive area to access their log chipping operation west of Mugaha Marsh and to haul wood chips. Donohue Forest Products Inc. has been active in timber harvesting immediately south of the area since 1994.

Along with the increases in use, there has been a growing recognition of the need to treat this area differently from adjacent areas in order to conserve the special mix of resource values that occurs here.

2.0 Site Description

2.1 Ecological Characteristics

The Mugaha Marsh Sensitive Area is situated on Crown Land in the Provincial Forest east of Williston Reservoir, approximately six kilometers northwest of Mackenzie. The Sensitive Area includes the south end of Tutu Bay, a series of small lakes and wetlands within a mid-seral stage mixed forest and the north end of Mugaha Bay. It is entirely within the Sub-Boreal Interior ecoprovince, Omineca Mountains ecoregion and the Parsnip Trench ecosection. It is in the sub-boreal spruce moist cool biogeoclimatic

subzone (SBS mk2 variant). The area contains site units through the complete described site series for the SBS mk 2. The forest types are predominantly aspen and birch. Lesser amounts of lodgepole pine occur on the drier areas and black spruce dominates the treed wetlands.

The landforms within the sensitive area are of glaciofluvial origin. Surface soils are mostly sand and gravel interspersed with clay lenses in the depressions. These thin clay layers resist water movement, resulting in the formation of small lakes or bogs in most of the depressions.

Although some of the larger lakes are connected by streams, most of the wetlands and lakes are isolated. One spring in Tutu Bay within the area at the north end remains open year round. There is a wide range of nutrient and pH conditions between individual wetlands/lakes ranging from low pH, nutrient poor floating bogs to near neutral pH, fertile lakes with *Polygonum*, pond-lilies and abundant aquatic invertebrates.

The combination of water, wetland and mixed forest supports a variety of wildlife species including reptiles, amphibians, birds and mammals. The species known to occur here are listed in Appendix 2 (this is considered to be a 'living' list with contributions received from the residents of Mackenzie and the volunteers of the MNO).

2.2 Identified Values and Uses

The Mugaha Marsh area has a high value for many wildlife species, particularly birds. Waterfowl, songbirds, and raptors use the area intensively throughout the migration and nesting periods. A few species of warblers and flycatchers use the area in very high numbers in late summer. These species apparently congregate here after the breeding season to molt and prepare for their southward migration.

There is a recreational trail running from about the midpoint of the proposed sensitive area off the road near the banding station, north to Tutu Bay through the middle of the area. The trail receives moderate use by hikers and horses.

The wildlife viewing site established by BC Hydro next to the banding station receives moderate use throughout the year.

There is a limited amount of hunting in the area for waterfowl and moose, though the discharge of rifles is prohibited in the portion of the area within the Mackenzie municipality.

Canadian Wildlife Service and Mackenzie Nature Observatory (MNO) have conducted a songbird migration monitoring program on the site since 1994. The MNO is a registered charity (#88801-9296RR001) and an incorporated society (S-36498) and plans to continue this program in the future. Moderate habitat improvements to the site have been conducted for example, in 1997 an osprey nesting platform was constructed to replace the

natural nest tree which had blown down the previous winter. The wall tent erected annually next to the viewing site for use as the banding lab has now been replaced by a building with a corresponding Licence of Occupation (#7407628) filed with BC Assets and Land Corporation. It lies in the mid-portion of the sensitive area and covers 8.5 ha (official date is August 2, 1999 for a term of ten years).

Both Mugaha Bay and Tutu Bay are within BC Hydro's Williston Reservoir and may be subject to periodic flooding to an elevation of approximately 675.1 meters ASL. To date, the reservoirs highest level has been approximately 672.7 meters and the normal annual high water level is approx. 672.1 meters. The periodic higher water levels assist in maintaining riparian vegetation over much of the Mugaha Bay area. Areas below 675.1 meters ASL are within the BC Hydro's water licence.

The area covers parts of two registered traplines.

The main road through the area is used and maintained by Chico Wood Fibre Ltd. It is a non-status unpaved single lane road leading to Special Use Permit S09250 registered to Johnson Salvage Ltd. There is one round metal culvert passing through it near the banding station that drains the east open water pond.

Approximately 367 ha of the area is covered by commercial forest. About 210 ha is coniferous forest, of which approximately 27 ha has been harvested within the last 10 years. The remainder of the commercial forest, about 157 ha, is predominantly deciduous species.

There are no mineral claims or placer claims in the area which is assessed as having high mineral potential.

The area is not included in the land being claimed by the McLeod Lake Indian Band under Treaty 8, however, it is within the general area traditionally used by their people.

3.0 Objectives and Strategies

LRMP participant consensus recommended that government create and use the sensitive area mechanism to conserve and manage this area's unique combination of forest, water and riparian vegetation. Strong support for this designation has been received from the members of the MNO.

Sensitive area objectives are statements of desired future condition for the landbase. They provide legally-binding direction for forest management and are implemented through operational plans. The associated strategies provide recommended approaches to achieving the objectives. They represent District Manager policy and will be considered in the approval of operational plans.

The objectives and strategies for the Mugaha Marsh Sensitive Area are intended to address the following key values and uses:

- the retention and enhancement of wildlife habitat, especially bird habitat;
- wildlife monitoring and research;
- non-motorized recreational use and wildlife viewing.

Management Objectives	Strategies
<ul style="list-style-type: none"> • Maintain the current mix of forest and wetland habitat for resident and migratory wildlife species. 	<ul style="list-style-type: none"> - Within the limits of BC Hydro’s water license, manage water levels on Mugaha Marsh to maintain riparian vegetative cover. - Limit timber harvesting within the sensitive area to a maximum of 10% of the commercial forest area, as defined in Section 2.2 of this plan, in any 10 year time period and utilize silvicultural practices that encourage the growth of native deciduous tree species appropriate for the site. Herbicides are considered incompatible. - Maintain a minimum 100m wide unlogged reserve zone adjacent to all lakes and wetlands, except where harvest of the zone is necessary for long-term retention of habitat values. Pesticides are considered incompatible. -On all disturbed areas, utilize practices that encourage the regrowth of native shrubs and other vegetation of high habitat value and discourages alien and noxious weeds. -Allow for limited habitat improvements for birds and wildlife within the context of maintaining general habitat values (to include mechanical vegetation control for transects, trails, netlanes and management within the marsh).
<ul style="list-style-type: none"> • Allow for wildlife monitoring and research activities within the sensitive area that do not conflict with other objectives. 	<ul style="list-style-type: none"> - Encourage non-destructive identification and documentation of all living species in the area. - Encourage the continuation of the ongoing songbird monitoring and research program.

Management Objectives	Strategies
<ul style="list-style-type: none"> Maintain the current range of non-motorized recreational uses and opportunities including wildlife viewing. 	<ul style="list-style-type: none"> - Allow the construction and use of research facilities within the sensitive area that do not conflict with the management objectives. - Enhance opportunities for wildlife viewing without reducing wildlife and bird habitat. - Permanent roads are limited to those identified on the map. Any other roads are to be kept to a minimum, considered temporary and revegetated in order to limit motorized access. - Limit the use of motor vehicles (including ATV's and snowmobiles) to existing roads only.
<ul style="list-style-type: none"> Provide reasonable precautions for the safety of users of the area. 	<ul style="list-style-type: none"> - Post signs cautioning road users of slow traffic and pedestrians along the road through Mugaha Marsh. -Regular research users to provide Chico Wood Fibre with a schedule of their activities.

4.0 Implementation Strategy

All provisions of the higher level plan take effect as of the date specified in the attached order. A statement of higher level plan transition is therefore not required.

The sensitive area and objectives will be reviewed during the planning process for the Parsnip Resource Management Zone/Landscape Unit as determined by the LRMP implementation strategy currently being developed by the Ministry of Forests. If at that time these objectives are found to be in conflict with those of the resource management zone or landscape unit, the sensitive area may be cancelled or amended. Otherwise the sensitive area and its objectives will be reviewed in ten years as outlined in the guidebook, *Higher Level Plans: Policy and Procedures*.

5.0 References Cited

MacKinnon, A., C. DeLong, and D. Meidinger. 1990. *A Field Guide for Identification and Interpretation of Ecosystems of the Northwest Portion of the Prince George Region*. Land Management Handbook #21 and 2000 Draft revision. BC MOF, Victoria, BC.

Ministry of Forests and BC Environment. 1995. *Biodiversity Guidebook*. Forest Practices Code of British Columbia.

Ministry of Forests and BC Environment. 1996. *Higher Level Plans: Policy and Procedures*. Forest Practices Code of British Columbia.

Ministry of Forests, BC Environment and LUCO. 1998. *Guide to Writing Resource Objectives and Strategies*.

Appendix 1

1.0 Rationale

Section 5 of the *Forest Practices Code of British Columbia Act* enables a district manager to establish a sensitive area and objectives if he or she believes that the area should be treated differently from adjacent areas in order to manage or conserve the forest resources.

A proposed sensitive area must also meet the following criteria in order to be established:

1. the area must be less than 1000 hectares in size;
2. the circumstances associated with the management or conservation of the area must be special and not broadly present in the district; and
3. the resource must be unique or locally significant.

These criteria are part of the chief forester policy outlined in Chapter 6 of the *Higher Level Plans: Policy and Procedures* document.

I believe that the Mugaha Marsh area meets these criteria. The purpose of the sensitive area and its objectives is to conserve the locally significant qualities of the area in accordance with the Parsnip resource management zone direction from the Mackenzie LRMP.

1.2 Consideration of public input

I received three written public submissions providing comments to the Sensitive Area plan. This public input was considered and as a result two strategies were reworded to clarify their intent. I would like to reiterate that although the sensitive area objectives are legally binding, the associated strategies are recommended approaches to achieve the objectives. The strategies are district manager policy and will be considered in my application of Section 41(1)(b) of the Forest Practices Code.

There was concern that a 100m reserve zone adjacent to all lakes and wetlands is not necessary and that riparian requirements of the Forest Practices Code should suffice. I considered this input but I will keep 100m reserve zone in order to ensure that the values of the sensitive area are maintained. The Forest Practices Code requirements are based on managing for these values at a landscape level and are insufficient to manage these values in a small area such as this.

There was also concern expressed over the encroachment of cutblocks in the sensitive area. It is important to remember that by establishing the sensitive area I am placing restrictions on the amount of harvest within a time period, not excluding harvest.

There has been some interest in the enhancement of recreational opportunities within the Mugaha Marsh sensitive area. Any increase in recreational activities must be not negatively impact the wildlife and bird habitat.

Based on public comment, I recommend that the Ministry of Land, Air and Water Protection consider the implementation of a no hunting zone in the Mugaha Marsh sensitive area.

2.0 The Planning Process

2.1 Information Assembly

Recognition and protection of the Mugaha Marsh area was first proposed by the Mackenzie Fish & Game Association - Environment Section (now formally organized as the Mackenzie Nature Observatory) in 1995. MNO members have collected and recorded information on the site since 1994. The sensitive area idea gained support at the LRMP table, resulting in a recommendation by that table in June of 1997, that government pursue some special management designation for the area. Because the values and use of the area were strongly related to the wildlife resource, BC Environment became the lead agency in the planning process. In July of 1997, the Ministry of Forests district manager agreed to consider sensitive area designation for the site and Mugaha Marsh was proposed as part of the MOF pilot project for sensitive areas. Due to budgetary constraints and other priorities for Ministry of Forests staff, information gathering, boundary determination, consultation and referrals were completed in-house by BC Environment staff. The LRMP process for Mackenzie gained momentum at the same time however, and so, due to the limited resources of Ministry of Environment, Lands and Parks, this proposal was not completed until late into 2000.

The boundary of the sensitive area was based on the recommendation of MNO and on the objective of including: Mugaha Marsh (a part of Mugaha Bay of Williston Reservoir); the system of small lakes and wetlands north of the marsh to Tutu Bay; and the forest edge around the marshes, lakes and wetlands. The boundary has been reviewed in the field by BC Environment staff.

In addition to the boundary recommendation, MNO members provided input to most of the management objectives and documentation for the species list in Appendix 2.

2.2 Consultation and Referrals

Initial public input has been provided by the Mackenzie LRMP table and Mackenzie Nature Observatory. Donohue Forest Products (DFP) has had opportunities for input through both of these organizations. Opposition is not anticipated to the proposal, therefore the public review process may be run concurrently with the agency review.

A public comment and review was held in April and May of 2001. Copies of the draft plan and map were made available at the Mackenzie Forest District and Prince George

Forest Region offices. Stakeholders in the area were sent copies of the draft for review and comment.

The comments have been received and the plan was revised as appropriate., Details of my consideration of the public input are outlined in the rationale. A “Notice of Impending Order” will be published in the local newspaper. The sensitive area will take effect on??

3.0 Relationship to Other Higher Level Plans

3.1 Mackenzie LRMP and Resource Management Zones

The Mugaha Marsh Sensitive Area is located within the “Parsnip” and “Mackenzie Townsite” Resource Management Zones (RMZ’s) of the Mackenzie LRMP. While the townsite falls under the settlement designation, the Parsnip RMZ has been assigned General Management Direction, General Zone Category Direction and the following specific RMZ objectives:

- 1) Fish – Maintain or enhance habitat of threatened or endangered (red listed) or vulnerable (blue listed) fish and shellfish species.
-Manage fish habitat and fish stocks for sustainable sport and sustenance fisheries.
- 2) Wildlife – Maintain habitat need of all naturally occurring wildlife species.
- 3) Energy – Maintain opportunities and access for oil and gas exploration, development and transportation while having due regard to impacts on other resource values.
- 4) Outdoor Recreation – Maintain opportunities for quality public and commercial recreation experience consistent with the management direction of each RMZ.
- 5) Visual Quality – Manage for visual quality in identified visually sensitive areas.

Although opportunities for resource extraction activities are limited within the sensitive area, resource development and extraction will occur throughout most of the rest of the RMZ.

3.2 Landscape Units and Biodiversity Emphasis Options

The Mugaha Marsh Sensitive Area is within the Parsnip Landscape Unit (LU) and the Mackenzie townsite. Parsnip LU had been given the interim biodiversity emphasis option of intermediate. Interim biodiversity emphasis options were jointly agreed to by the Ministry of Forests and Ministry of Environment, Lands and Parks for most of the LU’s in the Mackenzie Timber Supply Area in 1996. The LRMP implementation strategy is being developed at this time and to date, the LU objectives are considered equivalent to the RMZ objectives.

These biodiversity emphasis options, along with the recommended practices found in the biodiversity guidebook, recommends targets for forest seral stage distribution within a Landscape Unit. The management objectives and strategies for this sensitive area can be incorporated into and are consistent with the recommended practices for the Landscape Unit and the Resource Management Zone.

Appendix 2

Animal Species of Known Occurrence within Mugaha Marsh Sensitive Area
(data from BC Environment, Canadian Wildlife Service and Mackenzie Nature
Observatory)

Reptiles

Western garter snake, *Thamnophis elegans*
Common garter snake, *Thamnophis sirtalis*

Amphibians

Long-toed salamander, *Ambystoma macrodactylum*
Western toad, *Bufo boreas*
Spotted frog, *Rana pretiosa*
Wood frog, *Rana sylvatica*

Birds

Common loon, *Gavia immer*
Pied-billed grebe, *Podilymbus podiceps*
Horned grebe, *Podiceps auritus*
Red-necked grebe, *Podiceps grisegena*
Great blue heron, *Ardea herodias*
Tundra swan, *Cygnus columbianus*
Trumpeter swan, *Cygnus buccinator*
Greater white-fronted goose, *Anser albifrons*
Canada goose, *Branta canadensis*
Green-winged teal, *Anas crecca*
Mallard, *Anas platyrhynchos*
Northern pintail, *Anas acuta*
Blue-winged teal, *Anas discors*
Northern shoveler, *Anas clypeata*
American widgeon, *Anas americana*
Canvasback, *Aythya valisineria*
Redhead, *Aythya americana*
Ring-necked duck, *Aythya collaris*
Greater scaup, *Aythya marila*
Lesser scaup, *Aythya affinis*
Barrow's goldeneye, *Bucephala islandica*
Bufflehead, *Bucephala albeola*
Hooded merganser, *Lophodytes cucullatus*
Common merganser, *Mergus merganser*
Red-breasted merganser, *Mergus serrator*
Osprey, *Pandion haliaetus*
Bald eagle, *Haliaeetus leucocephalus*

Northern harrier, *Circus cyaneus*
Sharp-shinned hawk, *Accipiter striatus*
Coopers hawk, *Accipiter cooperii*
Red-tailed hawk, *Buteo jamaicensis*
Rough-legged hawk, *Buteo lagopus*
American kestrel, *Falco sparverius*
Merlin, *Falco columbarius*
Peregrine falcon, *Falco peregrinus anatum*
Spruce grouse, *Falcipennis canadensis*
Ruffed grouse, *Bonasa umbellus*
Sora, *Porzana carolina*
American coot, *Fulica americana*
Sandhill crane, *Grus canadensis*
Killdeer, *Charadrius vociferus*
Greater yellowlegs, *Tringa melanoleuca*
Lesser yellowlegs, *Tringa flavipes*
Solitary sandpiper, *Tringa solitaria*
Spotted sandpiper, *Actitis macularia*
Semipalmated sandpiper, *Calidris pusilla*
Western sandpiper, *Calidris mauri*
Least sandpiper, *Calidris minutilla*
Pectoral sandpiper, *Calidris melanotos*
Short-billed dowitcher, *Limnodromus griseus*
Common snipe, *Gallinago gallinago*
Bonaparte's gull, *Larus philadelphia*
Herring gull, *Larus argentatus*
Black tern, *Chlidonias niger*
Great horned owl, *Bubo virginianus*
Snowy owl, *Nyctea scandiaca*
Northern hawk owl, *Surnia ulula*
Barred owl, *Strix varia*
Short-eared owl, *Asio flammeus*
Northern saw-whet owl, *Aegolius acadicus*
Common night hawk, *Chordeiles minor*
Black swift, *Cypseloides niger*
Calliope hummingbird, *Stellula calliope*
Rufous hummingbird, *Selasphorus rufus*
Belted kingfisher, *Ceryle alcyon*
Yellow-bellied sapsucker, *Sphyrapicus varius*
Red-naped sapsucker, *Sphyrapicus nuchalis*
Red-breasted sapsucker, *Sphyrapicus ruber*
Downy woodpecker, *Picoides pubescens*
Hairy woodpecker, *Picoides villosus*
Three-toed woodpecker, *Picoides tridactylus*
Northern flicker, *Colaptes auratus*, 2 subspecies

Olive-sided flycatcher, *Contopus cooperi*
Western wood-pewee, *Contopus sordidulus*
Yellow-bellied flycatcher, *Empidonax flaviventris*
Alder flycatcher, *Empidonax alnorum*
Least flycatcher, *Empidonax minimus*
Hammond's flycatcher, *Empidonax hammondii*
Dusky flycatcher, *Empidonax oberholseri*
Western flycatcher, *Empidonax difficilis*, group
Eastern kingbird, *Tyrannus tyrannus*
Tree swallow, *Tachycineta bicolor*
Violet-green swallow, *Tachycineta thalassina*
Northern rough-winged swallow, *Stelgidopteryx serripennis*
Bank swallow, *Riparia riparia*
Cliff swallow, *Petrochelidon pyrrhonota*
Barn swallow, *Hirundo rustica*
Gray jay, *Perisoreus canadensis*
Stellar's jay, *Cyanocitta stelleri*
Blue jay, *Cyanocitta cristata*
Black-billed magpie, *Pica pica*
American crow, *Corvus brachyrhynchos*
Common raven, *Corvus corax*
Black-capped chickadee, *Poecile atricapillus*
Boreal chickadee, *Poecile hudsonicus*
Red-breasted nuthatch, *Sitta canadensis*
Brown creeper, *Certhia americana*
House wren, *Troglodytes aedon*
Winter wren, *Troglodytes troglodytes*
Golden-crowned kinglet, *Regulus satrapa*
Ruby-crowned kinglet, *Regulus calendula*
Mountain bluebird, *Sialia currucoides*
Townsend's solitaire, *Myadestes townsendi*
Gray-cheeked thrush, *Catharus minimus*
Swainson's thrush, *Catharus ustulatus*
Hermit thrush, *Catharus guttatus*
American robin, *Turdus migratorius*
Varied thrush, *Ixoreus naevius*
American pipit, *Anthus rubescens*
Bohemian waxwing, *Bombycilla garrulus*
Cedar waxwing, *Bombycilla cedrorum*
Northern shrike, *Lanius excubitor*
European starling, *Sturnus vulgaris*
Solitary vireo, *Vireo solitarius*, group
Warbling vireo, *Vireo gilvus*
Red-eyed vireo, *Vireo olivaceus*
Tennessee warbler, *Vermivora peregrina*

Orange-crowned warbler, *Vermivora celata*
Yellow warbler, *Dendroica petechia*
Magnolia warbler, *Dendroica magnolia*
Yellow-rumped warbler, *Dendroica coronata*, 2 subspecies
Townsend's warbler, *Dendroica townsendi*
Blackpoll warbler, *Dendroica striata*
Black and white warbler, *Mniotilta varia*
American redstart, *Setophaga ruticilla*
Ovenbird, *Seiurus aurocapillus*
Northern waterthrush, *Seiurus noveboracensis*
MacGillivray's warbler, *Oporornis tolmiei*
Common yellowthroat, *Geothlypis trichas*
Wilson's warbler, *Wilsonia pusilla*
Western tanager, *Piranga ludoviciana*
American tree sparrow, *Spizella arborea*
Chipping sparrow, *Spizella passerina*
Clay-colored sparrow, *Spizella pallida*
Savannah sparrow, *Passerculus sandwichensis*
Fox sparrow, *Passerella iliaca*, 2 subspecies
Song sparrow, *Melospiza melodia*
Lincoln's sparrow, *Melospiza lincolnii*
Swamp sparrow, *Melospiza georgiana*
Harris sparrow, *Zonotrichia querula*
White-throated sparrow, *Zonotrichia albicollis*
Golden-crowned sparrow, *Zonotrichia atricapilla*
White-crowned sparrow, *Zonotrichia leucophrys gambelii*
Dark-eyed junco, *Junco hyemalis*, 3 subspecies
Lapland longspur, *Calcarius lapponicus*
Snow bunting, *Plectrophenax nivalis*
Red-winged blackbird, *Agelaius phoeniceus*
Yellow-headed blackbird, *Xanthocephalus xanthocephalus*
Rusty blackbird, *Euphagus carolinus*
Brewer's blackbird, *Euphagus cyanocephalus*
Broom-headed cowbird, *Molothrus ater*
Pine grosbeak, *Pinicola enucleator*
Purple finch, *Carpodacus purpureus*
White-winged crossbill, *Loxia leucoptera*
Common redpoll, *Carduelis flammea*
Pine siskin, *Carduelis pinus*
Evening grosbeak, *Coccothrustes vespertinus*

Mammals

Common shrew, *Sorex cinereus*
Pygmy shrew, *Sorex hoyi*

Water shrew, *Sorex palustris*
Little brown myotis, *Myotis lucifugus*
Snowshoe hare, *Lepus americanus*
Southern red-back vole, *Clethrionomys gapperi*
Meadow vole, *Microtus pennsylvanicus*
Muskrat, *Ondatra Zibethicus*
Northern bog lemming, *Synaptomys borealis*
Beaver, *Castor canadensis*
Deer mouse, *Peromyscus maniculatus*
Porcupine, *Erethizon dorsatum*
Northern flying squirrel, *Glaucomys sabrinus*
Least chipmunk, *Tamias minimus*
Red squirrel, *Tamiasciurus hudsonicus*
Western jumping mouse, *Zapus princeps*
Coyote, *Canis latrans*
Gray wolf, *Canis lupus*
Red fox, *Vulpes vulpes*
Lynx, *Lynx canadensis*
Wolverine, *Gulo gulo luscus*
River otter, *Lontra canadensis*
Marten, *Martes americana*
Striped skunk, *Mephitis mephitis*
Ermine, *Mustela erminea*
Mink, *Mustela vison*
Black bear, *Ursus americanus*
Grizzly bear, *Ursus arctos*
Moose, *Alces alces*
Mule deer, *Odocoileus hemionus*
White-tailed deer, *Odocoileus virginianus*



British Columbia
Assets & Land Corporation
An agency of the government of British Columbia

Our File: 7407628

July 11, 2000

Mackenzie Nature Observatory
Box 1598
Mackenzie, BC
V0J 2C0

Dear Sirs:

Re: License of Occupation

Enclosed is an originally executed copy of License No. 703817, covering un-surveyed Crown Land in the vicinity of Mugahe Pond, Cariboo District containing 8.5 hectares, more or less.

This License is issued in the name of the Mackenzie Nature Observatory for a term of 10 years, commencing on the 2nd day of August 1999, for bird banding and observatory purposes.

Should you have any further questions, please contact Cheryl A. Dyson at (250) 565-8855.

Yours truly,

Cheryl A. Dyson
Documentation Clerk

/CD
Eric

c.c. Crown Land Registry Services, Victoria
BC Assessment Authority, Prince George
Regional District of Fraser-Fort George
Ministry of Forests, Mackenzie

Land Management Division - Okanagan/Peace Region - Prince George Office
455 - 1011 Fourth Avenue, Prince George, BC, V2L 3H9
Telephone (250) 565 - 6779 Fax (250) 565 - 6941

486000 (10)

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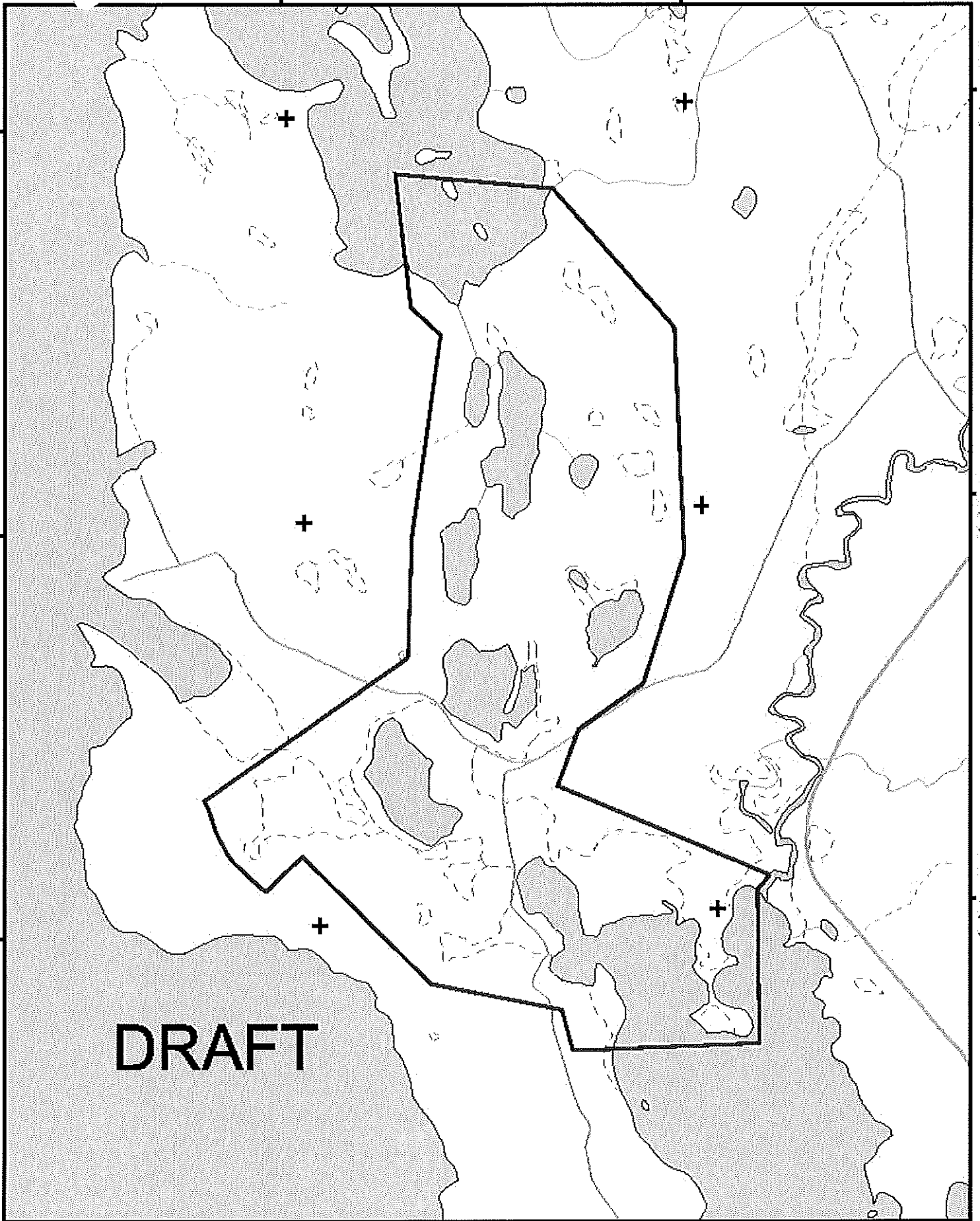
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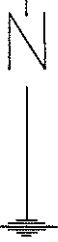
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DRAFT





FILE: FN02554 (Map Notation)

SHOWN AS A

BOLD SOLID LINE

Pulpwood Agreement

BCGS Reference Maps:

0930034 0930044
0930035 0930045

NAD 27/83 27

Reg. Compt. L
69 50
69 51
69 52

Drawn by PL

Date 2001-10-24

Revised by

Date

Planning Cell
A031 B001

ODM Map ID FN02554

ORCS * 12550-20

Scale 1: 20,000

CASCADES E A032

Area
hectares 611.3

ALL POINTS TAKEN FROM
TRIG. STN. TUCK
EXCLUDING THEREOUT
-R02299 Sec 3+4

FINLAY PROV FOREST

