Appendix H

Terrestrial Environment

Note

Prior to the release of the Draft EA, the Project was referred to as the *Island Falls Hydroelectric Project*. Following release of a draft environmental assessment report for review by First Nations, agencies, and members of the public, numerous comments were received. As a direct result of agency and public consultation, YFP made a decision to relocate the Project two kilometres upstream of Island Falls to Yellow Falls. Accordingly, the Project name has changed to the "Yellow Falls Hydroelectric Project" and the Project nameplate capacity has changed from 20 MW to 16 MW.

The following Vegetation and Wildlife report details existing conditions and was prepared for the Island Falls location. Project relocation has not appreciably altered descriptions of existing conditions.

ISLAND FALLS VEGETATION AND WILDLIFE ASSESSMENT

APPENDIX H

File No. 160960168

Prepared for:

Yellow Falls Power LP
34 Harvard Road
Guelph, ON N1G 4V8

Prepared by:

Stantec Consulting Ltd.
361 Southgate Drive
Guelph ON N0B 1T0

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1.0 Introduction

Yellow Falls Power Limited Partnership ("YFP") is proposing to build and operate the Island Falls Hydroelectric Project (the "Project"). The Project is a 20 Megawatt ("MW") run-of-the-river hydroelectric generating station at Island Falls on the Mattagami River, approximately 18 km upstream from the Town of Smooth Rock Falls, Ontario. Stantec Consulting Ltd. ("Stantec") was retained by YFP to conduct a terrestrial field sampling program to obtain baseline data for use in the assessment of potential effects of the Project.

Proposed wildlife and vegetation field sampling programs were circulated to the Ontario Ministry of Natural Resources ("MNR") and Environment Canada ("EC") for comment. Comments received from MNR (D. Clement, May 26, 2006) and EC (M. Shaw, June 19, 2006) were used to prepare the final field sampling program, dated July 10, 2006 (**Attachment A**).

1.1 STUDY AREA

The Study Area (**Figure H1-1**) for the terrestrial field sampling program includes:

- The proposed headpond, consisting of an inundated area of approximately 111 ha and extending approximately nine kilometres upstream of Island Falls along the Mattagami River
- The project's ancillary facilities (i.e., transmission lines, alternative access routes)
- The plant site

The Study Area includes the zone of potential influence, along with buffer lands:

- Within 200 metres of the proposed headpond boundary
- Within 300 metres of the plant site
- Within 100 metres of the alternative access and transmission line routes

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Figure H1-1 Study Area

Back of Figure

The Study Area is located within the Boreal Forest zone (Rowe, 1972). The dominant cover consists of black and white spruce (*Picea mariana, P. glauca*), balsam fir (*Abies balsamea*), tamarack (*Larix laricina*), trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), black ash (*Fraxinus nigra*), and white birch (*Betula papyrifera*). Bogs and fens are abundant in the general area, but few occur within the Project Study Area. Non-peatland wetland ecosystems are found along major rivers in the area, including the Mattagami.

Vegetation along the Mattagami River valley slopes is generally semi-mature to mature with a diverse forest structure. Natural disturbances in these areas include fire (historical), wind throw and, to a lesser extent, disease and insect damage. Vegetation communities along the proposed access and transmission routes also experience disturbance from roads, all-terrain vehicle trails and logging. Approximately half of the Study Area west of the river has been influenced by logging, whereas the portion of the Study Area on the east side of the Mattagami River is less disturbed.

1.2 STUDY PURPOSE

The field program is designed to provide answers for the following list of questions. The answers to each of these questions will provide a basis for future monitoring work and for identifying appropriate mitigation measures to minimize the potential effects of the Island Falls Hydroelectric Project on terrestrial organisms and habitat in the affected areas.

I. What are the distributions, types, structures, and compositions of upland communities within the Study Area?

II. What are the distributions, types, structures, and compositions of wetland communities within the Study Area?

III. What is the abundance and distribution of vegetative resources that are significant to wildlife within in the Study Area?

IV. What are the abundances, distributions, and species of breeding birds present within the Study Area?

V. What species of amphibians and reptiles are present within the Study Area?

VI. What species of mammals are present within the Study Area?

VII. What are the predicted effects of the project infrastructure on existing vegetation units, wildlife, and wildlife habitat?

VIII. What are the predicted effects of inundation of the headpond area on existing vegetation units, wildlife, and wildlife habitat?

The answers to these questions will:

- Provide a basis for identifying potential effects of the proposed Island Falls Hydroelectric Project on wildlife, vegetation communities and habitat
- Allow for identification of appropriate mitigation measures to minimize or eliminate potential effects
- Assist in the development of a post-construction monitoring program

2.0 Approach and Methodology

2.1 BACKGROUND RESOURCES

Acres International Limited 1990 Environmental Appraisal for the Project contained preliminary information on the composition and functions of the vegetation resources. One of the goals of the present field sampling program was to obtain more detailed information through a rigorous survey of the Project site.

Prior to conducting field investigations, existing information was compiled from a variety of sources, including:

- MNR Natural Resources & Values Information System ("NRVIS") database
- Aerial photography and topographic maps to identify major vegetation cover types and principal topographic features
- NHIC database (2007) to identify any natural areas of provincial significance or species of conservation concern
- Ontario Herpetofaunal Summary Atlas (Oldham and Weller, 2000)
- Atlas of the Breeding Birds of Ontario (www.birdsontario.org/atlas/datasummaries)
- Atlas of the Mammals of Ontario (Dobbyn, 1994)
- Significant Wildlife Habitat Technical Guide (MNR, 2000)
- Ducks Unlimited Canada
- Local trappers

Lists of flora and fauna of conservation concern that could potentially occur within the Study Area were assembled from the background research to aid with terrestrial field work.

2.2 VEGETATION SURVEY

Fieldwork was conducted to characterize existing conditions within the Study Area and assess the natural heritage features present. Data collected during terrestrial fieldwork included the distribution, type, structure and composition of vegetation communities within the upland and wetland areas of the Project Study Area. Floristic surveys of aquatic, wetland and terrestrial habitats were conducted concurrently. Other vegetative resources that are important to wildlife, such as potential moose feeding areas, waterfowl habitats, and old-growth forest stands, were recorded if present.

Major vegetation cover types were initially interpreted and delineated on aerial photographs and topographic maps. Preliminary vegetation mapping was prepared using the Field Guide to Forest Ecosystem Classification ("FEC") for Northeastern Ontario (2000) and the Terrestrial and Wetland Ecosites of Northwestern Ontario framework (Racey et al., 1996). The vegetation polygons were surveyed in detail through ground-truthing in the summer and fall of 2006 (July 5-11; August 23-28; October 1). Fixed-area plots were spatially distributed throughout the Study Area to survey a range of ecosystem types representative of the various topographic features, soil types, and moisture and drainage regimes.

Forest communities were sampled using the sampling techniques described in the FEC. This included selecting plots in representative locations of forest polygons and collecting quantitative data on the tree, shrub and herbaceous understorey layers. Major cryptogams (mosses, lichens and ferns) were recorded based on the Braun-Blanquet cover-abundance scale. A total of fifty-five 20 m x 20 m sample plots were established. Plant cover-abundance was visually estimated within each plot using the following strata:

- Main canopy
- Secondary canopy
- Tall shrubs (2-10 m)
- Low shrubs (0.5-2 m)
- Dwarf shrubs (<0.5 m)
- Forbs and graminoids
- Cryptogams

Detailed notes were also made on the topographic location, soil type, moisture, and drainage characteristics. Only forest stands greater than 2 ha that could be definitively categorized were assigned a specific FEC label. If a forest stand could be further catergorized to include the vegetation type ("V-Type"), this label was also assigned to the community.

Wetland communities along the Mattagami River and lower reaches of tributaries were generally accessed by canoe and boat. Presence, cover-abundance of vascular plant species, and habitat characteristics were recorded in each representative polygon.

A running floristic list was kept and updated throughout the field investigations as species were encountered during the survey. Particular attention was placed on the potential presence of species of conservation concern. The common and scientific nomenclature used generally follows Newmaster et al. (1998).

Soils were sampled using a Dutch auger and described using the methodology detailed in the Field Manual for Describing Soils in Ontario (Denholm and Schut, 2001). Horizon type, depth/thickness, and texture were recorded.

2.3 WILDLIFE SURVEYS

2.3.1 Breeding Birds

The objective of the breeding bird surveys was to collect data on the species, abundance, and distribution of birds in the Study Area. Information from existing documents was compiled as part of the assessment of species diversity and to help identify potential species of concern or areas of importance to birds within the Study Area. Major sources of information for the background research were the District MNR office, Ducks Unlimited, the Atlas of the Breeding Birds of Ontario, and the NHIC database.

In April, 2006, Stantec consulted the MNR (E. Prevost, pers. comm.) and Ducks Unlimited Canada (C. Mitchell, pers. comm.) to determine the importance of the Mattagami River for migrating waterfowl. The Canada Land Inventory[1] land capability for waterfowl mapping shows that the Mattagami River, within the Study Area, is designated as Capability Class 6, thus having “severe limitations to the production of waterfowl”. Based on these consultations and background research, coupled with Stantec’s knowledge of the setting and ecology in this part of the river, it was determined that waters within the Study Area are not significant staging areas for migrating waterfowl or significant for breeding waterfowl.

The Study Area was initially assessed using aerial photography and topographic map interpretation as part of the vegetation survey. This step identified major cover types (e.g., coniferous forest, deciduous/mixed forest, marshes, bogs/fens) and principal topographic features (e.g., slopes, river terraces, creek and river valleys).

Breeding bird surveys were conducted from June 18-21 and July 6-10, 2006. Five vegetation community types (beaver pond, coniferous forest, mixed forest, deciduous forest, and clear-cut areas) were surveyed for breeding birds. Surveys in forest habitat consisted of area searches and were conducted on foot, walking transects through the community. River habitat and wetlands along the river were accessed from a boat. All birds seen or heard, or observations of distinctive signs, were recorded.

In addition to area searches and incidental observations, 54 point counts were used to collect quantitative, reproducible data on breeding birds. Protocols were consistent with those of the Atlas of the Breeding Birds of Ontario. Five-minute point counts, placed at least 250 m apart, were conducted in five vegetation community types. All birds seen or heard within 100 m of the surveyor were recorded. Birds observed either visually or audibly outside the 100m radius were recorded on a second list. Data recorded in this manner permitted the calculation of bird species density in each habitat type.

[1] The mapping of land capability for waterfowl uses a national system developed with the aid of the Canadian Wildlife Service. Capability for waterfowl production requires a sufficient quantity and quality of food, protective cover, and space to meet the needs for survival, growth, and reproduction.

2.3.2 Amphibians and Reptiles

Amphibian and reptile populations within the Study Area were expected to be representative of the Boreal Forest. The Study Area offers some marsh and muskeg-like habitat for breeding amphibians, and upland forest habitat for foraging adult amphibians and snakes.

Area searches, done in conjunction with other natural heritage investigations, were utilized to ensure thorough coverage of each habitat within the Study Area. Area searches are often used to survey birds, and Environment Canada (2006b) describes this field method as “an effective means for developing a species list for a site”. The method, adapted for non-avian species searches, involved visiting habitat types in the Study Area and listing species encountered. This was accomplished during other natural heritage field surveys (April through August, 2006), where effort was directed at turning over rocks to look for snakes on rocky outcrops, and flipping logs and other organic debris to look for salamanders throughout the Study Area.

Calling frogs were recorded when visiting wetlands during the breeding bird and vegetation surveys. An assessment of suitable salamander breeding habitat was conducted along the potential transmission line and access road routes.

2.3.3 Mammals

Observations of mammals, or distinctive mammal signs such as tracks, were primarily opportunistic. Field staff completing aquatic, breeding bird and vegetation surveys between April and August 2006 recorded observations along the proposed access road and transmission line routes, as well as in the vicinity of the plant site.

Information from the Atlas of the Mammals of Ontario (Dobbyn, 1994) was compiled to obtain a list of species occurring in the 100 x 100 km block that includes the Study Area. Local trapper Yvon Arsenault (pers. comm., January 25, 2007), who has operated a trap line east of the Mattagami River for over 30 years and whose family had conducted similar activities for several decades, was consulted to refine this list, to obtain more site-specific information, and provide information on mammal community trends.

3.0 Results of Terrestrial Field Sampling Program

3.1 VEGETATION

3.1.1 Vegetation Communities

A total of fifty-five 20 x 20 m plots were sampled within thirty-six vegetation types. Figures in **Attachment B** depict the type and distribution of the vegetation communities along the access roads and transmission lines, the area proposed for inundation and the plant site. A detailed description of each community is provided in **Attachment C**. Despite the overall flat terrain within the Study Area, a diverse range of vegetation types was recorded. Most of the diversity can be attributed to the Mattagami River and its in-flowing tributaries.

On the tableland areas, the natural diversity and heterogeneity of microhabitats were coupled with logged areas that have naturally or artificially regenerated. Mesic and wet-mesic sites were found on the tableland areas, typically covered by a diverse mixed forest with various associations of dominant species such as trembling aspen, balsam poplar, white birch, white and black spruce and balsam fir. These species occurred in numerous combinations and varying proportions, making definitive classifications of some forest stands difficult.

Generally, forested areas with well-drained soils supported a high cover of white spruce, balsam fir, white birch and trembling aspen. Bottomlands contained more balsam poplar and black spruce. Pure deciduous or pure coniferous stands were uncommon in the Study Area. Poorly drained sites on organic peat soils were typically dominated by black spruce and tamarack forests, interspersed with open communities resembling muskegs.

Speckled alder (*Alnus incana*), willow (*Salix sp.*) and red osier dogwood (*Cornus stolonifers*) thickets were the dominant woody vegetation along Mattagami River tributaries, while the open areas that flood with spring run-off supported various meadow communities.

Well-drained mixed woods and occasional birch or aspen stands were the dominant communities covering the slopes of the Mattagami River valley. The steeper sections of the slopes commonly contained white cedar (*Thuja occidentalis*) and white spruce vegetation types. The bottom of the slopes and the low lying islands in the river contained diverse meadows with varying compositions and proportions of broad-leaf herbs, sedges and grasses.

Aquatic vegetation communities, such as those dominated by submerged pondweeds, have limited representation in the Study Area. These communities were generally recorded in slow current areas and in sheltered bays along some sections of the Mattagami River. Approximately 14% of the Mattagami River shoreline supported aquatic vegetation (linear measurement).

3.1.2 Vascular Plant Species

A total of 288 vascular plant species were recorded in the Study Area during the field investigations (**Attachment D**). The majority (89% or 257 species) of the species are native to Ontario, which reflects the natural character of the Study Area.

91% of the native species are ranked S5 (common, widespread and abundant in Ontario). A total of 21 species are ranked S4 (uncommon but not rare in Ontario and apparently secure). One species, yellow-rattle (*Rhinanthus minor* ssp. *groenlandicus*) is ranked S3 (vulnerable in the province due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation). This species is absent in southern Ontario, hence its provincial rarity ranking; however, this plant was commonly found along roadsides and trails off Highway 655.

3.1.3 Plant Species at Risk

No rare, threatened or endangered aquatic or terrestrial plant species at the provincial or national scale were recorded, with the exception of yellow rattle.

3.2 WILDLIFE

A total of nine butterflies, four amphibians, one reptile, 103 birds (98 breeding birds) and five mammal species were directly observed during surveys conducted for this study. These species, along with additional species known to occur in the Study Area, are listed in **Attachment D**.

Most species known to occur or potentially occur in the Study Area are designated S5 (secure, common, widespread and abundant in Ontario), S4 (apparently secure, uncommon but not rare in Ontario) S4S5, or SE (exotic, not a native component of Ontario's fauna).

3.2.1 Birds

The Atlas of the Breeding Birds of Ontario (2006) lists 180 species that were recorded during 2001-2005 in the 100 x 100 km block (UTM reference 17ME) that includes the Study Area (**Attachment E**). The Study Area occupies two 10 x 10 km squares, representing 2% of the Atlas block. Waterfowl, shorebirds and grassland birds were recorded in the block, but not in the Study Area due to the absence of suitable habitat. Seven owl species were also recorded in the 100 x 100 km block, but not in the Study Area, perhaps because they are more readily detected by call in late winter and early spring than in the summer.

A total of 103 bird species were observed during field surveys conducted for this study (**Attachment E**). All species are designated S5 (secure, common, widespread and abundant in Ontario) or S4 (apparently secure, uncommon but not rare in Ontario), and one species, the European Starling, is ranked SE (exotic, not a native component of Ontario's fauna). 98 species were expected to breed in the study area. Four colonial species (Great Blue Heron, Ring-billed

Gull, Herring Gull and Common Tern) were observed foraging or moving through the Study Area, but no breeding colonies were present. A Northern Pintail was observed flying over the Study Area, which is outside its regular breeding range.

Bald Eagles, a provincial species of Special Concern, were observed flying over the Study Area. No nests were observed in the Study Area during surveys conducted in 2006; however, an active nest was observed along the west side of the Mattagami River approximately 120 m south (upstream) of the mouth of the Muskego River during the fisheries surveys in the spring of 2007.

Attachment G lists the fifteen most abundant bird species recorded in each of five habitat types: beaver pond/meadow (10 point counts), coniferous forest (11 point counts), mixed forest (19 point counts), deciduous forest (6 point counts) and clear cut (4 point counts). An additional four point counts were located in coniferous or mixed forest with a beaver pond component.

White-throated Sparrow was the most abundant species in the Study Area, and was the most abundant species in every habitat type, with the exception of deciduous forest. Other species that were ubiquitous in the Study Area include Swainson's Thrush, Yellow-rumped Warbler and Nashville Warbler (**Attachment G**). These species, and many others detected on point counts, are area-sensitive forest species that require a minimum of 30 to 100 ha of suitable forest habitat for breeding.

3.2.2 Amphibians and Reptiles

A review of the Ontario Herpetofaunal Summary Atlas (Oldham and Weller, 2000) indicated that the eastern garter snake is the only reptile species likely to be present in the Study Area. The Atlas also indicates a total of eleven species of amphibians potentially occur in the Study Area (**Attachment E**). Based on the Atlas, the amphibian species known to occur in the general geographic area include the American toad, spring peeper, boreal chorus frog, gray treefrog, wood frog, northern leopard frog, green frog, mink frog, blue-spotted salamander, spotted salamander, and northern two-lined salamander.

Four species of frogs/toads were observed during the 2006 field surveys, with most wet areas along Red Pine Road supporting American toads, northern leopard frogs and spring peepers that called throughout the day. Mink frogs were heard earlier in the day at several locations. However, very little potential habitat for snakes (potential hibernacula, cobble, boulder or sandy areas) or salamanders (large logs) was observed along the potential road and transmission line routes. Rocky outcrop habitat was generally limited to small areas near Island Falls and Yellow Falls. One garter snake was observed in suitable cobble and boulder habitat below Island Falls.

3.2.3 Mammals

The Atlas of the Mammals of Ontario (Dobbyn, 1994) lists 26 species of mammals in the 100 x 100 km block that includes the Study Area (**Attachment E**). All species are designated S5 (secure, common, widespread and abundant in Ontario) or S4 (apparently secure, uncommon

but not rare in Ontario), and one species, house mouse, is ranked SE (exotic, not a native component of Ontario's fauna). The Atlas also lists wapiti (elk), which does not occur in the Study Area, and white-tailed deer, which might very rarely appear in summer, south of the Study Area (Y. Arsenault, pers. comm.). White-tailed deer were far more common in earlier decades, but have been generally replaced in the vicinity of the Study Area by moose. Caribou, which are not listed in the Atlas for the block, may occur sporadically at a considerable distance north of the Study Area (Y. Arsenault, pers. comm.).

Lynx and marten were virtually absent in the area in the 1940's, and reappeared over the next few decades (Y. Arsenault, pers. comm.). In recent years, lynx have been regularly encountered, but populations vary cyclically as they are dependent on snowshoe hare populations. Lynx populations in the vicinity of the Study Area have been very low for the last few years (Y. Arsenault, pers. comm.).

The following mammal species were observed by Stantec during field studies:

- Beaver (Castor Canadensis)
- Black Bear (Ursus americanus)
- Grey Wolf (Canis lupus)
- Moose (Alces alces)
- Red Squirrel (Tamiasciurus hudsonicus)
- Snowshoe Hare (Lepus americanus)

3.2.4 Wildlife Species at Risk

The monarch butterfly is listed as a federal species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada ("COSEWIC") and the Committee on the Status of Species at Risk in Ontario ("COSSARO"). The Bald Eagle is listed in northern Ontario as a species of Special Concern by COSSARO and not at risk by COSEWIC.

The monarch regularly occurs throughout southern Ontario and its range extends north of the Study Area (Layberry et al., 1998). It requires milkweed species (*Asclepias syriaca*) for laying eggs and as larval food plants, although the adult feeds on a variety of wildflower nectar. This migratory species has been designated under the federal *Species at Risk Act* ("SARA") because it is threatened by increasing use of pesticides, loss of old field and meadow breeding habitat, and loss of wintering habitat in Mexico (Environment Canada, 2006a).

Although Bald Eagles are widespread in Canada and the United States, their abundance varies regionally. In Ontario, 31 active nests were present in the southwest in 2006, while northern populations are healthier. Bald eagles mainly on fish, but also rely on birds, small mammals, and carrion. Their nests are usually large stick platforms placed in trees located near large open water bodies. In northern Ontario, populations declined as a result of pesticide use (e.g. DDT) beginning in the 1950s. Main threats to this species today are shooting, accidental trapping, poisoning, and electrocution (Royal Ontario Museum, 2006; MNR, 1987)

4.0 Analysis

4.1 VEGETATION

4.1.1 Potential Effects - Headpond Area

The headpond will extend from Island Falls to Loon Rapids, located approximately nine km upstream. The total headpond area is approximately 230 ha, approximately half of which is presently occupied by the existing river area.

The proposed headpond will result in inundation of approximately 111 ha of predominately forested land. For the most part, natural cover in the area proposed for inundation consists of mixed forest communities with a lesser extent of coniferous and deciduous forest. Although these vegetation types are common in the Study Area and in the regional landscape, the valley of the Mattagami River in this location is characterized by older forest on moderately steep slopes, with good forest structure, and is undisturbed except by natural occurrences such as fire and wind throw. Some larger trees, snags and logs along the shoreline provide potential feeding and denning habitat for furbearing wildlife. These shoreline characteristics are expected to develop at many locations along the margins of the proposed headpond. **Table 4.1** describes vegetation community types that will be affected by formation of the headpond.

The headpond will also replace some thicket swamp and small areas of meadow marsh. Similar habitat is expected to develop at the edges of the new headpond. River velocity will be reduced over existing conditions, potentially encouraging the development of additional wetland communities. Approximately 14% of the shoreline currently supports aquatic vegetation; this proportion is expected to remain the same or increase under post-construction conditions.

Headpond clearing will affect on the following vegetation types (**Table 4.1**):

Table 4.1 Vegetation Types (Headpond)

Symbol	Vegetation Type	Area (hectares)
Upland/Mixed Communities		
BPBA-FOD	Balsam Poplar – Black Ash	0.97
BPOF-FOD	Balsam Poplar – Ostrich Fern	0.24
BPWB-FOD	Balsam Poplar – White Birch	4.67
BSTA-FOC	Black Spruce – Tamarack – Sphagnum - Feathermoss	1.83
CWS-FOC	White Cedar – White Spruce	0.77
CWS-FOC_WSF-FOC	White Cedar – White Spruce/White Spruce – Balsam Fir	2.26
FWSA-FOC	Balsam Fir - White Spruce - Trembling Aspen	0.17

Table 4.1 Vegetation Types (Headpond)

Symbol	Vegetation Type	Area (hectares)
HETH	Speckled Alder – Leatherleaf – Labrador-tea Heathland	3.42
SFBA-FOM	Spruce – Balsam Fir - White Birch – Trembling Aspen	53.17
SFBA-FOM_TABP-FOD	Spruce – Balsam Fir - White Birch – Trembling Aspen/Trembling Aspen – Balsam poplar – Speckled Alder	10.2
SMTS	Shoreline Mixed Herb-Rich Thicket	0.68
CWS-FOC	White Cedar – White Spruce	1.1
TAMM-FOD	Trembling Aspen – Mountain Maple	2.47
WBF-FOM	White Birch – Balsam Fir	5.73
WBMM-FOD	White Birch – Mountain Maple	1.27
WSF-FOC	White Spruce – Balsam Fir	7.21
Total		***96.16***
Marsh Communities		
GFMM	Mixed Graminoid-Forb Meadow Marsh	0.82
SEMM	Sedge Meadow Marsh	0.37
SGMM	Sedge-Grass Meadow Marsh	1.08
Total		***2.27***
Swamp Communities		
ROTS	Red Osier Thicket Swamp	0.09
ROTS_SATS	Red Osier Thicket Swamp/Speckled Alder Thicket Swamp	6.35
SATS	Speckled Alder Thicket Swamp	1.68
Total		***8.12***
Other		
Pond		0.17
CC	Clear cut	0.8
Total		***0.97***
TOTAL		**108**

4.1.2 Potential Effects - Access and Transmission Routes

Access to Island Falls on the north and west sides of the Mattagami River are proposed by upgrading Red Pine Road to a two-lane road (14 km) plus seven km of new road, which will follow an existing ATV trail. The 115 kV transmission line will utilize the same right-of-way as the access road and will require additional clearing. Construction and staging will also require vegetation clearing. Vegetation communities affected include primarily mixed forest with some coniferous and deciduous stands, as well as clear-cut or previously logged areas that are regenerating with secondary tree and shrub growth (**Attachment B**). The extent of tree clearing required for the road and transmission line is small compared to the clear cuts for logging that has occurred and is ongoing in this area. **Table 4.2** describes vegetation community types that will be affected by access and transmission line construction.

Some smaller wet areas of thicket swamp, usually located where small creeks intersect the Red Pine road, will also be affected by the road upgrade and construction works. The amount of these habitats that will be affected by construction of the road and transmission lines is very small relative to the habitat available. Standard good construction practices such as properly installed and maintained sediment controls and installation of properly sized culverts where required will minimize effects to wetland features.

The alternate access route on the east side of the Mattagami River is characterized by mixed and coniferous forest and thicket swamp (**Attachment B**). The east side has experienced less logging disturbance, although the proposed access follows an existing ATV trail.

Yellow rattle, a provincially rare plant species, is commonly found along Highway 655 and roadside trails. It was not noted in access, construction, staging, and transmission areas and is unlikely to be affected by construction. If any occurrences are noted, plants should be transplanted to a more suitable location.

Table 4.2 Vegetation Types (Access, Construction, Staging, and Transmission)

Symbol	Vegetation Type	Area (hectares)
Upland/Mixed Communities		
BSH-FOC	Black Spruce – Herb Rich	1
BSLA-FOC	Black Spruce – Labrador-tea – Speckled Alder – Stair-step Moss	5.67
BSPH-FOC	Black Spruce – Tamarack – Sphagnum	2.6
BSTA-FOC	Black Spruce – Tamarack – Sphagnum - Feathermoss	1.67
CC/SFBA-FOM	Clear cut/ Spruce – Balsam Fir - White Birch – Trembling Aspen	24.5
FTA-FOM	Balsam Fir – Trembling Aspen	4.18
RES/FARM	Residential/Farm	0.51
SATS	Speckled Alder Thicket Swamp	11.86
SFBA-FOM	Spruce – Balsam Fir – White Birch – Trembling Aspen	72.61
TABP-FOD	Trembling Aspen – Balsam poplar – Speckled Alder	1.44
TAMARACK FEN	Tamarack Fen	2.5
TAMM-FOD	Trembling Aspen – Mountain Maple	4.63
TAMM-FOD	Trembling Aspen – Mountain Maple	6.75
TASF-FOC	Tamarack – Sphagnum - Feathermoss	15.39
BSLT-FOC	Black Spruce – Labrador-tea – Feathermoss – Sphagnum	1.68
Total		***156.99***
Marsh Communities		
BGMM	Blue-joint Grass Meadow Marsh	8.59
SEMM	Sedge Meadow Marsh	0.58
Total		***9.17***
Swamp Communities		
SATS	Speckled Alder Thicket Swamp	11.86
WATS	Willow - Speckled Alder Thicket Swamp	3.16
Total		***15.02***

Table 4.2 Vegetation Types (Access, Construction, Staging, and Transmission)

Symbol	Vegetation Type	Area (hectares)
Other		
CC	Clear cut	65.2
CC/Regeneration	Clear cut/Regeneration	32.05
Total		***97.25***
TOTAL		**278.43**

4.2 WILDLIFE

4.2.1 Importance of the Study Area

The wildlife community in the Study Area is typical of the boreal forest with some anthropogenic influence, reflected in the presence of three non-native species (cabbage white butterfly, European Starling and house mouse). Two species of Special Concern, monarch butterfly (federally listed) and Bald Eagle (provincially listed) were observed, but there was no evidence of breeding within the Study Area. Monarchs rely on stands of milkweed species, which were not recorded in the Study Area. This species is known to occur north of the Study Area (Layberry et al., 1998), and individuals observed in June were likely migrants moving through.

Wildlife habitat was generally uniform, with primarily mixed forests dominated by varying proportions of white and black spruce, poplar species and balsam fir. Pure deciduous or coniferous stands were rare. Amphibian habitat in the form of floodplains and beaver ponds was abundant, and area-sensitive birds were ubiquitous. Specialized habitat for snakes, salamanders, cavity-nesting or roosting birds and mammals was scarce, and no cave or cliff habitat was present. Habitat that could provide significant staging or breeding areas for shorebirds and waterfowl was also absent.

Potential aquatic feeding areas for moose and feeding and denning areas for mink, otter, and marten may be present along the shores of the Mattagami River. However, very little shallow aquatic habitat with preferred moose food plants such as pond lilies, sedges, water milfoil, bladderwort, or macroscopic algae (MNR, 2000) was recorded in the Study Area. The feeding and denning characteristics listed by MNR (2000) as criteria for determining significance for furbearers, such as large trees more than 40 cm in diameter (marten) and shorelines with numerous dead falls, large logs, log jams, and rock piles (mink and otter) were present to some extent. MNR (2000) notes that for mink, otter and marten feeding and denning sites, habitat assessments should be approached at a landscape level; if these species are present in the area and large blocks of suitable habitat are represented post-development, these species are likely to continue to be present.

4.2.2 Potential Effects

Potential effects to wildlife could result from loss of habitat through inundation, access road, transmission line, power plant and dam construction, or through disturbance and increased human activity during construction and operation of the proposed facility.

Birds

Several species of waterfowl were observed using or flying over the portion of the Mattagami River that will be inundated. However, the river at this location has been designated as Capability Class 6 by the Canada Land Inventory, defined as having "severe limitations to the production of waterfowl". The river provides negligible breeding or staging habitat for waterfowl. Creation of a headpond will result in more opportunities for waterfowl, through the creation of a flat water body and diverse shoreline habitat. Other waterbirds such as foraging herons or gulls will also have similar or enhanced feeding opportunities.

The preferred breeding habitat for Bald Eagle is adjacent or close to relatively clear and shallow (< 1 m) water bodies with productive fish populations. Most significant nesting habitats have numerous large conifer and/or deciduous trees in good condition along the shoreline, providing birds with good visibility and clear flight line to the nest (MNR, 2000). Bald Eagles do not currently nest within the Study Area, but the proposed headpond will increase the littoral zone (< 2 m depth) by 17% (**Appendix G**). Water velocities will be reduced compared to existing conditions and provide for an increase in potential foraging habitat.

Several bird species in the Study Area depend on extensive forest habitats. Some habitat will be lost through headpond formation, and construction of the access road and transmission lines will result in the removal of some forest (**Table 4.2**), but this will be linear, and a large part will follow existing roads or trails. Relative to the amount of forest in the area, tree clearing required for construction of the plant will be negligible. Localized displacement of some area-sensitive forest birds will likely occur as a result of the Project but no effects to regional populations are anticipated.

Disturbance to birds during construction may arise from noise, human activity and habitat loss. It is expected that the more sensitive birds, such as forest raptors, will temporarily avoid the forest areas adjacent to construction. It is recommended that tree clearing for the access road, transmission line and power plant, as well as the area to be inundated by the headpond take place outside the core breeding season for forest birds, to avoid disruption or destruction of their nests. The core breeding season for forest birds, May 9-July 23, may need to be refined in consultation with Environment Canada for this latitude. Tree clearing activities for the project are scheduled for the winter months, and thus effects on breeding birds are not anticipated. If tree clearing is required during the breeding season, a prior nest survey by an ornithologist should be undertaken to identify nesting birds. Identified nests should be provided with an appropriate no-clearing buffer until breeding season has ended and young have fledged.

Disturbance during operation will result from limited road traffic and low-level noise from the power plant. The bird species present are expected to become quickly habituated to these types of disturbances and plant operations will not have a measurable effect on regional populations.

Amphibians and Reptiles

Four species of frogs and toads were widespread throughout the Study Area, mostly in wet areas along the proposed access road and transmission line routes. The amount of habitat that will be affected by construction is small relative to the habitat available. Good construction practices, effective sediment controls, and properly sized and installed culverts (where required) will minimize potential effects to these wetland habitats.

The creation of the headpond, with its associated reduction in river flow velocity, may also create additional habitat suitable for amphibian breeding. Preferred habitat for the garter snake (potential hibernacula, cobble, boulder, rock outcrops or sandy areas) is limited in the Study Area. One garter snake was observed in suitable cobble and boulder habitat below Island Falls and this habitat will remain unchanged as a result of construction and operation of the run-of-river hydro facility. Much of the limited rocky outcrop habitat will be lost due to inundation.

Mammals

As a result of headpond inundation, additional areas suitable for moose feeding will be created. Approximately 14% of the shoreline supports aquatic vegetation under pre-construction conditions, although a much smaller proportion is composed of the preferred food plant species. Moose feeding area may slightly increase post-construction, since the area of the littoral zone (< 2 m in depth) is expected to increase by 17% and flow velocities will be significantly reduced, encouraging establishment of additional aquatic macrophytes. (**Appendix G**).

Inundation will result in the loss of current shoreline habitat that potentially provides feeding and denning habitat for mink and otter, and denning habitat for marten. Similar habitat is expected to natural establish along the margins of the headpond within a relatively short timeframe.

Disturbance during operation will result from limited road traffic (operations staff only) and low-level noise from the plant. Direct vehicle access by the public to Island Falls will be prevented by a gate at the junction of Red Pine Road and the new access road. No direct vehicle access presently exists. Most species of wildlife will become quickly habituated to this type of disturbance. Species that are more sensitive to disturbance, including marten and lynx, will likely continue to avoid areas with even low levels of human activity. Traffic is not expected to be at levels sufficient to influence mammal movement.

5.0 Conclusions

A wide range of forest habitat of varying species composition occurs in the Study Area. Approximately 111 ha of relatively undisturbed mixed forest and small, isolated wetland communities will be replaced by the headpond, although new wetland communities are expected to become established within the littoral zone of the headpond and throughout riparian areas. Clearing for the access roads and transmission lines will result in the loss of additional disturbed forest, including clear cut areas and secondary growth. Locating access road and transmission line infrastructure on or adjacent to existing roads and trails will reduce the amount of forest to be removed and thereby minimize environmental effects. Some wetland areas, primarily thicket swamp, will also be removed along these routes, but effects to the remaining habitats can be minimized through the use of good construction practices, including sediment control and maintenance of surface water flow patterns.

The wildlife community in the Study Area is typical of the Boreal Forest with some anthropogenic influence. All of the species known to occur or potentially occur in the Study Area are designated S5 (secure, common, widespread and abundant in Ontario), S4 (apparently secure, uncommon but not rare in Ontario) S455 or SE (exotic, not a native component of Ontario's fauna). Monarch, a federal species of Special Concern, was observed passing through the area, and Bald Eagle, a provincial species of Special Concern, breeds in region, but no nests were observed within the Study Area.

Habitat may be created or enhanced for breeding or staging waterfowl and Bald Eagle through inundation. Habitat effects on area-sensitive forest birds will be minimal. Disturbance during construction will be largely indirect and can be partly mitigated by conducting activities at appropriate times (e.g. tree clearing to occur outside of breeding bird window). Some mammal species that are more sensitive to disturbance, such as marten and lynx, avoid areas with even low levels of human activity.

In general, effects on wildlife are expected to be minimal, and will be minimized through implementation of industry standard construction practices and mitigation measures. These effects are considerably less than the effects to wildlife associated with the historic and ongoing logging activities in the area.

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Attachment A

Terrestrial Field Program

ATTACHMENT A
YELLOW FALLS TERRESTRIAL FIELD SAMPLING PROGRAM

File No. 160960168
November 2007

Prepared for:

Yellow Falls Power
Limited Partnership
c/o 500, 1324 – 17th Avenue SW
Calgary, AB T2T 5S8

Prepared by:

Stantec Consulting Ltd
361 Southgate Drive
Guelph ON N1G 3M5

ATTACHMENT A
YELLOW FALLS TERRESTRIAL FIELD SAMPLING PROGRAM

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ATTACHMENT A
YELLOW FALLS TERRESTRIAL FIELD SAMPLING PROGRAM

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1.0 Introduction

The terrestrial field sampling program has been prepared to address the proposed development of the Island Falls Hydroelectric Project at Island Falls on the Mattagami River, by Yellow Falls Power Limited Partnership (“YFP”).

The Study Area for the terrestrial field sampling program includes the terrestrial and wetland habitat affected by: the inundation of approximately nine kilometres of the Mattagami River upstream of Island Falls; the project’s ancillary facilities (i.e., transmission lines, alternative access routes), and the plant site.

The Study Area includes the zone of potential influence along with buffer lands. This will include the lands along the Mattagami River within the inundated area, within 200 metres of the proposed headpond boundary, within 300 metres of the plant site, and the lands within 100 metres of the alternative access and transmission line routes.

The field sampling program has been designed to be comprehensive and to address all pertinent aspects of baseline terrestrial data collection related to the installation of the proposed hydroelectric facility. Stantec Consulting Ltd. (“Stantec”) has designed this program in conjunction with YFP and with regard for Appendix M of the 1990 Waterpower Program Guidelines (“WPPG”).

Comments from the Ontario Ministry of Natural Resources (“MNR”) and Environment Canada (“EC”) will be used to refine and focus efforts so that data collected in the field will allow YFP to address relevant questions regarding project effects and potential mitigation and compensation strategies.

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2.0 Island Falls Terrestrial Field Sampling Program Rationale

The field program is designed to provide answers for the following list of questions. The answers to each of these questions will provide a basis for future monitoring work and for identifying appropriate mitigation measures to decrease or nullify the effects of the Island Falls Hydroelectric Project on terrestrial organisms and habitat in the affected areas.

I. What is the distribution, type, structure, and composition of upland communities within the Study Area?

II. What is the distribution, type, structure, and composition of wetland communities within the Study Area?

III. What is the abundance and distribution of vegetative resources that are significant to wildlife within in the Study Area?

IV. What is the abundance, distribution, and species of breeding birds present within the Study Area?

V. What species of amphibians and reptiles are present within the Study Area?

VI. What species of mammals are present within the Study Area?

VII. What are the predicted effects of the project infrastructure on existing vegetation units, wildlife, and wildlife habitat?

VIII. What are the predicted effects of inundation of the headpond area on existing vegetation units, wildlife, and wildlife habitat?

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3.0 Island Falls Terrestrial Field Sampling Program

The following sections outline the basic tasks associated with each of the components of the comprehensive terrestrial field sampling program. The Study Area will be surveyed and examined using the methods detailed in this field sampling program.

3.1.1 Vegetation Survey

Objectives

The vegetation survey will collect the data on the distribution, type, structure, and composition of vegetation communities within the Study Area. A floristic survey of vascular plant species will be conducted concurrently. The vegetation survey will concentrate on wetland areas and forests within the Study Area. Other vegetative resources in the project area that are significant from the wildlife viewpoint, such as moose feeding areas, mineral licks, waterfowl habitats, and old-growth forest stands will also be surveyed.

Characteristics of Study Area

The Study Area is located within the Boreal Forest zone. The dominant cover is that of black and white spruce, balsam fir, and tamarack, while trembling aspen, balsam poplar, black ash, and white birch represent the deciduous species. Bogs and fens are abundant in the general area, but few appear to occur near the project site. Non-peatland wetland ecosystems are found along major rivers, such as the Mattagami.

Acres International Limited conducted an initial survey of the project area in 1989-90. The resulting Environmental Appraisal Report contained preliminary information on the features and functions of the vegetation resources. The present fieldwork program aims to supplement the Environmental Appraisal Report through a rigorous survey of the Study Area.

Methods

The Study Area will be initially assessed using air-photo and topographic map interpretation to identify major cover types (e.g., coniferous forest, deciduous/mixed forest, marshes, bogs/fens) and principal topographic features (e.g., slopes, river terraces, creek and river valleys). Preliminary vegetation mapping will be prepared, using the Forest Ecosystem Classification (“FEC”) for Northeastern Ontario. Land and vegetation polygons identified through air-photo and topographic map interpretation will be surveyed in detail during ground-truthing in the summer of 2006.

Prior to conducting field invesigations, existing background research will be collected from a variety of sources, including the MNR's Natural Resources & Values Information System ("NRVIS") database and their Natural Heritage Information Centre ("NHIC") database. This background information will be used to help focus the field surveys and in the interpretation of results. It will also assist with the identification of any vulnerable, threatened, or endangered species.

Forest communities will be sampled using the methodology developed for the FEC. Briefly, this will consist of selecting plots in representative locations of forest polygons and collecting quantitative data on the trees and shrub and herb understorey, along with notes on the topographic location, soil type, moisture, drainage, etc. Forested areas will be traversed on foot on pre-determined transects along topographic catena.

Wetlands along the river will be generally accessed from the boat, while wetlands in other parts of the Study Area will be traversed on foot. In representative polygons plot data will be collected on the presence and cover-abundance of vascular plant species and habitat characteristics. This data will be used to characterize wetland habitat and plant community structure, providing a general classification of wetland areas.

A running floristic list will be kept to document all species encountered during the survey. Particular attention will be placed on any rare or significant species. Voucher specimens of plants will be collected, as necessary, for laboratory identification.

Time Schedule

It is proposed that the vegetation survey take place during two periods. An early July survey will focus on forest communities, while an August survey will concentrate on wetlands.

3.1.2 Breeding Bird Survey

Objectives

The objective of the breeding bird survey will be to collect data on the species, abundance, and distribution. The bird surveys will include, but are not limited to, waterfowl and waterbirds breeding in the wetlands, forest nesting raptors and songbirds. The survey will concentrate on collecting data from each vegetation community identified within the Study Area during the initial assessment using air-photo and topographic maps (**Section 3.1.1**). Background research will be compiled to identify potential species of concern or areas of importance to birds within the Study Area. Point counts will also be used to collect quantitative, reproducible data on breeding birds.

Surveys for migrating waterfowl have not been included in the workplan. Background research to-date has included recent consultations with biologists at MNR (E. Prevost, per comms) and Ducks Unlimited (C. Mitchell, per comms) to investigate the importance of the Mattagami River

for migrating waterfowl within the Study Area. In addition, the Canada Land Inventory[1] provides mapping of the land capability for waterfowl. The Mattagami River in the Study Area is designated as Capability Class 6, defined as having "severe limitations to the production of waterfowl". Based on these consultations and background research, coupled with Stantec's knowledge of the setting and ecology in this part of the river, it has been determined that the waters within the study area are not significant staging areas for migrating waterfowl. Migrating waterfowl may pass over the site, however high concentrations of waterfowl are not anticipated within the waters of the study area.

It is thought that Bald Eagles may inhabit this region of northern Ontario. As such, the field studies will place emphasis on determining presence and/or status of breeding Bald Eagles within the Study Area.

Characteristics of Study Area

The bird population is expected to be representative of the Boreal Forest. The dominant habitat is coniferous forests of black and white spruce, balsam fir, and tamarack.

Methods

Secondary information sources will be collected on bird activity within the Study Area. Major sources of information for the background research will be the local MNR, Ducks Unlimited, the Breeding Bird Atlas of Ontario, and the Birds of North America website. This information will also assist with the identification of any vulnerable, threatened, or endangered species.

The Study Area will be initially assessed using air-photo and topographic map interpretation as part of the vegetation survey (**Section 3.1.1**). This step will identify major cover types (e.g., coniferous forest, deciduous/mixed forest, marshes, bogs/fens) and principal topographic features (e.g., slopes, river terraces, creek and river valleys). The breeding bird study will be based upon the identified vegetation communities as noted below.

Each type of vegetation community will be visited. Surveys in forest habitat will be conducted on foot, walking transects through the community. Surveys of river habitat and wetlands along the river will be accessed from a boat. Visual observations will be made, but the survey will focus on observations of birdcalls.

Point counts will be taken in each type of vegetation community. Protocols similar to those used by the Breeding Bird Atlas of Ontario and Bird Studies Canada will be used to conducted the point counts. Point counts will be conducted by standing in one location for five minutes. A list will be compiled of all birds seen or heard within 100 m of the surveyor. A second list will be made of birds observed outside the 100 m radius. Appropriate calculations will be done to

[1] The mapping of land capability for waterfowl uses a national system developed with the aid of the Canadian Wildlife Service. Capability for waterfowl production requires a sufficient quantity and quality of food, protective cover, and space to meet the needs for survival, growth, and reproduction.

determine density of bird species. Point counts will be placed at least 500 m apart. If possible, at least five point counts will be taken in each vegetation type.

Time Schedule

The breeding bird survey is scheduled to take place in early July, concurrent with the typical height of breeding activity.

3.1.3 Amphibian and Reptile Surveys

Objectives

The objective of the amphibian and reptile surveys will be to determine species presence within the zone of potential influence and buffer lands. Potential effects to amphibian populations are not considered to be significant. Amphibian habitat is considered to be abundant within the vicinity of the study area. However, the majority of marsh, muskeg and other suitable habitat for breeding amphibians are contained outside the zone of potential influence. As the amount of disturbance to amphibian habitat is significantly low on the regional scale, an intensive monitoring program is not proposed.

Characteristics of Study Area

The amphibian and reptile populations are expected to be representative of the Boreal Forest. The Study Area offers marsh and muskeg for breeding amphibians and upland forest habitat for non-breeding foraging of adult amphibians and snake populations.

The NHIC's Herpetofaunal Atlas (2002) has indicated that the eastern garter snake is the only reptile species likely to be observed in the Study Area. A number of amphibian species are known to occur in this geographic area, including American toad, spring peeper, boreal chorus frog, grey treefrog, wood frog, northern leopard frog, green frog, mink frog blue-spotted salamander spotted salamander and northern two-lined salamander.

Methods

Secondary sources of information on amphibian and reptiles in the Study Area will be reviewed. Sources for the background information will include MNR and NHIC's Ontario Herpetofaunal Summary Atlas. Opportunistic garter snake observations will be made while conducting the breeding bird and vegetation surveys. Effort will be made to turn over rocks and to look for garter snakes on rocky outcrops, particularly during early morning bird surveys.

Area searches[2] will be utilized to ensure thorough coverage of each habitat within the study area. These surveys will be done in conjunction with other natural heritage investigations.

Emphasis will be placed on detecting calling frogs when visiting wetlands during the breeding bird and vegetation surveys. Surveys will not be conducted to observe salamander species, however, an assessment of suitable salamander breeding habitat will be made.

Time Schedule

Amphibian call observation and salamander breeding habitat assessments will be carried out during the late June and early July breeding bird survey. Reptile observations will take place throughout the field program, from June to August.

3.1.4 Mammal Survey

Objectives

The objective of the mammal survey will be to determine species presence within the Study Area. Emphasis will be placed on large mammal observations along the proposed access road and transmission line routes as well as in the vicinity of the plant site. The habitat contained within the zone of potential influence provides mainly mixed forests of black spruce, aspen and birch. These communities are well represented in the vicinity of the study area. The overall impacts to mammal species are therefore not considered to be significant.

Characteristics of Study Area

The Study Area is located within the Boreal Forest zone dominated by coniferous forest cover of black and white spruce, balsam fir, and tamarack. Bogs and fens are abundant in the general area, but few appear to occur near the project site. As such, it is anticipated that mammal populations will be representative of Boreal Forest communities, including species such as moose, bear, lynx, marten and northern flying squirrel.

Methods

Along the proposed access road and power line alternatives, as well as the plant site, emphasis will be placed on detecting large mammals such as moose and bears. Observations of large mammals will rely on opportunistic sightings and identification of tracks.

Observations within the Study Area will also focus on small mammals, including furbearers. Observations of smaller mammals will rely on identification of tracks and opportunistic sightings

[2] The term “area searches” most often refers to bird surveys, and Environment Canada describes this field method as “an effective means for developing a species list for a site”. The method, adapted for non-avian species searches, will involve visiting all of the different habitat types in the study area and keeping a list of all species encountered. EC describes the requirements of this method: “In its simplest form, an area search does not require standardized effort, although the amount of effort should be recorded”.

during the fieldworks. Area searches, described in **Section 3.1.3**, will be utilized to ensure thorough coverage of each habitat with the study area. A list of all mammal species observed, including the habitat they are using, will be recorded These surveys will be done in conjunction with other natural heritage investigations.

Information from local trappers is expected to provide valuable information on the presence of mammal species within the study area. Other secondary sources of information, such as MNR records of moose densities and furbearer locations will be used where available. This information will supplement the field investigations.

Time Schedule

Mammal observations will be taken from June to August, throughout the field program.

4.0 Results of Terrestrial Field Sampling Program

The results of the breeding bird, amphibian and reptile, mammal, vegetation and floristic surveys will be presented in stand alone technical reports as appropriate, with associated mapping and species lists. The reports will identify potential terrestrial effects associated with the proposed project.

The vegetation section will include a vegetation map, floristic analysis, and detailed descriptions of vegetation cover types, assessments of the significance of the vegetation communities and how representative they are for the region. Analyses will determine changes to vegetation as a result of the proposed project.

The breeding bird section will include a map of survey and point count locations and the location of significant species. Discussions on breeding birds will include species diversity, density of species and the identification of predicted effects of the proposed project.

Discussions on amphibians, reptiles, and mammals will focus on the presence and diversity of species. The potential effects of the proposed project on reptiles, amphibians and mammals will be identified. Identification of the potential effects on mammal movements will also be considered.

Building upon the field data, coupled with data collected as part of the Fisheries Work Plan and secondary information sources, suitable habitat(s) within the Study Area will be identified for key wildlife species (i.e., Red-necked Grebe or Bald Eagle). Data collected during the field survey will also be used to establish how the habitat(s) are primarily used (e.g., nesting sites, feeding areas, and wintering areas) by key species.

This work, along with any recommended protective or mitigative measures, will be integrated into the Project Information Package/Environmental Review Report being prepared for the project.

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5.0 Conclusion

This terrestrial field sampling program has set out the specific tasks designed to answer the questions listed in **Section 2.0**. This will in turn provide baseline data for post-construction monitoring of the Island Falls Hydroelectric Project, as well as provide scientifically defensible data from which mitigation plans can be derived.

In summary and for continued reference, the following list explicitly demonstrates how the detailed field sampling program (**Section 3.0**) will answer each of the eight questions posed in **Section 2.0**:

Q1: What is the distribution, type, structure, and composition of upland communities within the Study Area?

- Analysis of air-photo and topographic maps to identify major vegetation cover types and principal topographic features;
- Review of secondary information to identify significant upland communities, vascular plant species and distribution; and,
- Surveys of upland vegetation communities as outlined in the vegetation survey methodology (**Section 3.1.1**).

Q2: What is the distribution, type, structure, and composition of wetland communities within the Study Area?

- Analysis of air-photo and topographic maps to identify major vegetation cover types and principal topographic features;
- Review of secondary information to identify significant wetland communities, vascular plant species and distribution; and,
- Surveys of wetland vegetation communities as outlined in the vegetation survey methodology (**Section 3.1.1**)

Q3: What is the presence and distribution of vegetative resources that are significant to wildlife within the Study Area?

- Review of secondary information to identify vegetation resources that may be significant to wildlife; and,
- Surveys of vegetative resources that are significant from the wildlife viewpoint as outlined in the vegetation survey methodology (**Section 3.1.1**).

Q4: What is the abundance, distribution, and species of breeding birds present within the Study Area?

- Review of secondary information to identify presence and population size of key bird species likely to be found within the Study Area; and,
- Surveys of the breeding bird population characteristics in the Study Area as outlined in the breeding bird survey methodology (**Section 3.1.2**)

Q5: What species of amphibians and reptiles are present within the Study Area?

- Review of secondary information to identify the presence of amphibian and reptile species likely to be found within the Study Area; and,
- Surveys of amphibian and reptile populations as outlined in the amphibian and reptile survey methodology (**Section 3.1.3**)

Q6: What species of mammals are present within the Study Area?

- Review of secondary information to identify presence and population size of key mammal species likely to be found within the Study Area; and,
- Surveys of mammal populations as outlined in the mammal survey methodology (section 3.1.4)

Q7: What are the predicted effects of the project infrastructure on existing vegetation units, wildlife and wildlife habitat?

- The findings of the wildlife and vegetation surveys, in combination with data collected during review of secondary information sources and as part of the Fisheries Work Plan, will be used to define the baseline conditions within the Study Area. This information, coupled with the proposed infrastructure construction plans, will be used to identify changes to vegetation units, wildlife, and wildlife habitat;

Q8: What are the predicted effects of inundation of the headpond area to existing vegetation units, wildlife and wildlife habitat?

- The findings of the wildlife and vegetation surveys, in combination with data collected during review of secondary information sources and as part of the Fisheries Work Plan, will be used to define the baseline conditions within the Study Area. This information, coupled with the proposed post-construction headpond conditions, will be used to identify changes to vegetation units, wildlife, and wildlife habitat.

6.0 References

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Prevost., E. 2006. Planning Biologist. Cochrane District Ministry of Natural Resources. Personal Communication to Andrew Taylor, April 2006.

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Attachment B

Ecological Land Classification Figures

FRAME 1

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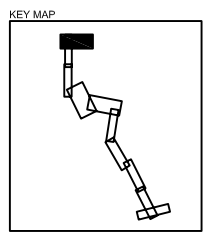
1. BASE CONTOURS FROM LiDAR SURVEY FLOWN JUNE 2005 BY TERRAPOINT CANADA INC.
2. ELEVATIONS ARE CANADIAN GEODETIC DATUM.
3. MINIMUM RIVER INVERT PROFILE ESTIMATED.
4. WATER SURFACE PROFILES ESTIMATED FROM HEC-RAS MODELLING.
5. TOP OF ISLAND FALLS DAM BASED ON 2m FREEBOARD FOR 1 IN 100 YEAR WIND INDUCED WAVES ON 2km FETCH.

KEY MAP



Canadian Projects Limited

Yellow Falls Power LP

Stantec

0 200 400 600 800 Metres

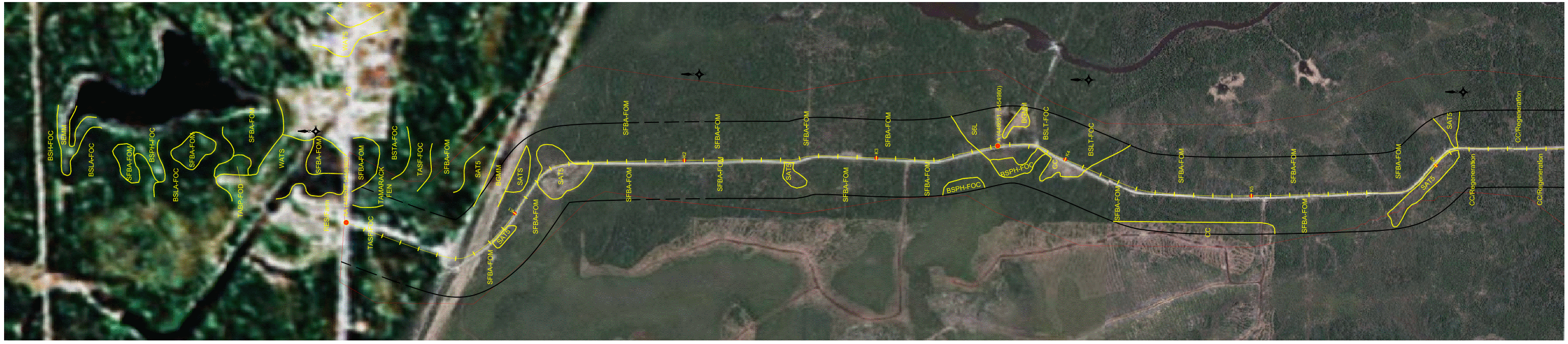
Scale 1:20000

ISLAND FALLS HYDROELECTRIC PROJECT
VEGETATION & WILDLIFE ASSESSMENT

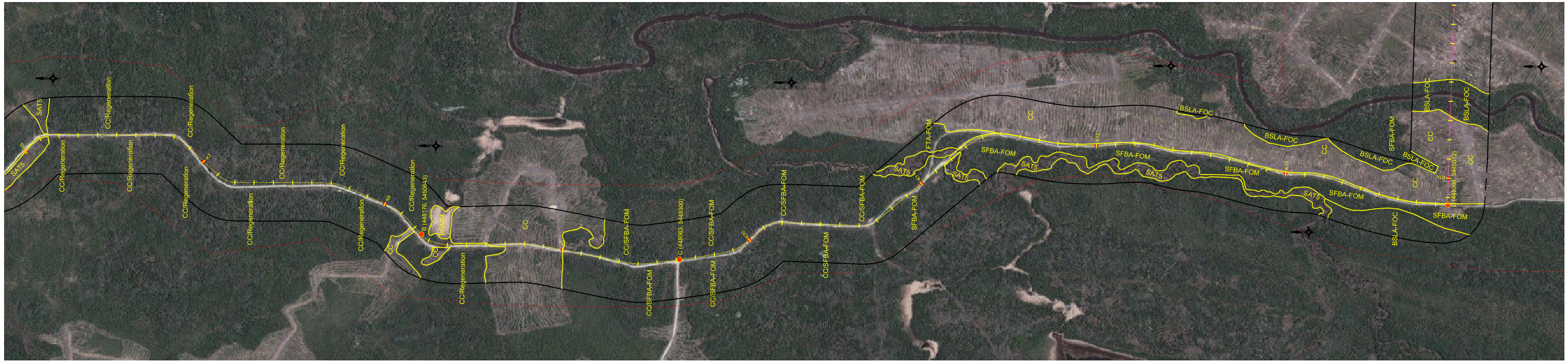
Figure No. 1 of 7

ELC FOR ACCESS ROADS AND TRANSMISSION LINES

FRAME 2



FRAME 3



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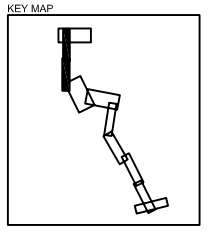
1. BASE CONTOURS FROM LiDAR SURVEY FLOWN JUNE 2005 BY TERRAPOINT CANADA INC.
2. ELEVATIONS ARE CANADIAN GEODETIC DATUM.
3. MINIMUM RIVER INVERT PROFILE ESTIMATED.
4. WATER SURFACE PROFILES ESTIMATED FROM HEC-RAS MODELLING.
5. TOP OF ISLAND FALLS DAM BASED ON 2m FREEBOARD FOR 1 IN 100 YEAR WIND INDUCED WAVES ON 2km FETCH.

KEY MAP



Canadian Projects Limited

Yellow Falls Power L.P.

Stantec

0 200 400 600 800 Metres

Scale 1:20000

ISLAND FALLS HYDROELECTRIC PROJECT
VEGETATION & WILDLIFE ASSESSMENT

Figure No. 2 of 7

ELC FOR ACCESS ROADS AND TRANSMISSION LINES

FRAME 4

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1. BASE CONTOURS FROM LiDAR SURVEY FLOWN JUNE 2005 BY TERRAPOINT CANADA INC.
2. ELEVATIONS ARE CANADIAN GEODETIC DATUM.
3. MINIMUM RIVER INVERT PROFILE ESTIMATED.
4. WATER SURFACE PROFILES ESTIMATED FROM HEC-RAS MODELLING.
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Canadian Projects Limited

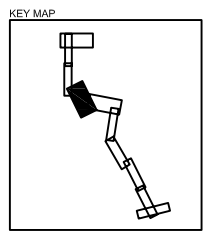
Yellow Falls Power LP

Stantec

0 200 400 600 800 Metres

Scale 1:20000

KEY MAP



ISLAND FALLS HYDROELECTRIC PROJECT
VEGETATION & WILDLIFE ASSESSMENT

Figure No. 3 of 7

ELC FOR ACCESS ROADS AND TRANSMISSION LINES