

**Bob's Lake site**  
**Plan of Subdivision**  
**Township of South Frontenac**  
**DRAFT---Environmental Impact Assessment (EIA)**

## 1.0 Introduction

### 1.1 Background

Niblett Environmental Associates Inc. was retained by McIntosh-Perry Consulting Engineers Ltd. to undertake a review of the natural environment in regards to a proposed plan of subdivision. This Environmental Impact Assessment (EIA) is part of an application for a plan of subdivision on a property on Bob's Lake.

### 1.2 Location and Study Area

The property was located on Part of Lots 34 and 35, Concession 5 and Part of part 1, and all of parts 2-6, Plan 1316982 and Part of Lots and 33 and all of Lots 34 and 35, Concession 6 and Parts 1-12 of Plan 13R-16988 in the geographic Township of Bedford, now in the Township of South Frontenac.

The study area for the EIS included the boundaries of the property as shown on Figures 1 and Figure 2. The study area for identifying significant natural features extended 120 m further in all directions.

The property was located on a peninsula of land between Crow Lake (north) and Mud Bay of Bob's Lake (south). Access to the site was from the east from Alder Lane west of Badour Road and from the north along Alf Patterson Road from Crow Lake Road.

## 2.0 Study Rationale

The rationale for the completion of an EIA for the development proposed was based primarily on the presence of the two lakes (Bob's Lake and Crow Lake) and concern for water quality and fisheries. The presence of several stream crossings and a possible pike spawning area requires the completion of an EIA.

The property is designated as rural and zoned rural and agricultural. The on-site ponds and wetland pockets are designated Environmental Protection and Environmentally Sensitive Areas. The EP designation (s 5.2) includes a wide variety of features including wetlands, watercourses and lakes, as well as floodplains, erosion hazards, poor drainage, organic soil and steep slopes. *The ESA overlay identifies lands that should be developed in an environmentally sensitive manner and/or protected in the long term. Lands include sensitive groundwater recharge and discharge areas, natural connections between natural heritage features, fish habitat and significant wildlife habitat.* The features identified as EP are wetlands or ponds with none of the natural features on the site designated as significant woodlands, portion of the habitat of endangered or threatened species, ANSI's or provincially significant wetlands. Section 5.2 states that *all lands within 90 metres of the highwater mark of all lakes and rivers which are not designated EP are included as ESA's.*

Section 5.2.7 (b)(i)(4) states: *development and/or site alterations proposed within 30 metres of the high water mark will require an EIA, prepared in accordance with section 5.2.11 which evaluates the potential negative impacts on fish habitat.*

In addition the Township has specific policies (s. 5.2.8) related to lake trout due to a high concentration of inland lake trout lakes in their jurisdiction. The OP identifies lakes in the Township which are defined as either highly sensitive or moderately sensitive to new development and site alterations. Crow Lake was identified as a moderately sensitive lake trout lake. The Mud Bay portion of Bob's Lake that defines the southern shore of this property is not considered a lake trout lake.

Moderately sensitive lake trout lakes are considered to have limited capacity for additional development. Section 5.2.8 (b)(i) *requires the proponent of a development proposal to undertake a Lake Impact Assessment (as per section 5.2.10) to determine if the lake can accommodate the proposed development.* The Lake Impact Assessment

is completed to determine if the development will have a negative impact on the adjacent waterbody by causing impairments to water quality and indirectly impact on fish habitat.

This EIA report incorporates both the EIA requirements (s. 5.2.11) and the Lake Impact Assessment into one report.

Section 5.2.11 states *an EIA will consist of :*

- a) *a description of the proposed development.....*
- b) *a description of the negative impacts that will be caused or that might reasonably be expected to be caused to the environment and the ecological functions and features associated with the feature;*
- c) *description of the negative impacts the proposed development will have on fish habitat including water quality requirements or effect on other features and functions;*
- d) *a statement indicating whether negative impacts will result from the proposal and a description of the actions necessary ... to prevent, change or to mitigate the negative impacts ...upon the environment and/or ecological functions and features as a result of the proposed development*
- e) *a description of how the mitigative measures will be implemented and/or enforced*
- f) *any measures, where deemed appropriate, to monitor the mitigation measures and to assess the long term impacts associated with the proposal*

## 3.0 Study Methodology

### 3.1 General Approach

NEA completed the natural environment study of the subject lands in three phases. The first phase was a review of the background biological information on the site including fisheries data, creek habitat information, Natural Heritage Information Centre, Ministry of Natural Resources and other sources.

In the second phase site visits were conducted on June 12<sup>th</sup>, July 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and September 9<sup>th</sup>, 2003 by our terrestrial and fisheries biologists to survey the vegetation and wildlife on the property and the shoreline and fish and fish habitat in the vicinity of the creeks, ponds and lakes.

The final phase was to incorporate both the field data and literature into this report.

### 3.2 Detailed Study Methodology

#### 3.2.1 Fish and Fish Habitat

Bob's and Crow Lakes have been sampled in recent years and the results are compiled as part of the Fish Habitat of the Tay River Watershed : Existing Conditions and Opportunities for Enhancement ( DRAFT ) watershed study published in June of 2003.

As such, no fish sampling was conducted in either of these lakes. Fish habitat assessments were carried out as per Stanfield et. al. (2001) and included habitat mapping and photodocumentation.

Fish habitat sampling was conducted at the six proposed creek crossings for the internal roads by two method sampling. Minnow traps were set overnight in waters of sufficient depth and electrofishing was conducted in shallow streams.

Fish habitat descriptions and visual observations of fish were also made for the Mud Bay shoreline by boat survey along the proposed waterfront lots.

### 3.2.2 Water Quality and Lake Capacity

In completing our analysis no new, original data was used. Existing information from the Ministry of the Environment, the Ministry of Natural Resources and the Rideau Valley Conservation Authority were used. Specifically MOE/MNR (1993) and OMNR/DFO/PCRC/RVCA (undated) were used to provide information to allow the used of the Lakeshore Capacity Study or Dillon model (LCS, 1986).

### 3.2.3 Vegetation

Background information was collected from the Ministry of Natural Resources (MNR), Natural Heritage Information Centre (NHIC) and forest resource inventory mapping. Prior to field visits, the vegetation communities, potential linkages and corridors were delineated on air photos.

In the second stage, field inventories were conducted in June, July and September 2003 to document species throughout the growing and breeding seasons. Community boundaries and descriptions delineated on air photos were ground truthed. Specimens were collected of species requiring verification and/or photos taken of unusual species. Adjacent properties were visited to ascertain the extent of community boundaries beyond the property limits and to inventory the species present.

General notes on disturbance, topography, soil types, soil moisture and state of each community were also compiled.

Plant checklists for each community and a master plant species list (Appendix 1) were compiled from field notes in the final phase. Naming of the vegetation community types was based on the Ecological Land Classification for Southern Ontario (Lee et. al., 1998) and was done to the community type level.

Species significance or rarity on a national, provincial, regional and local level was based on published literature and standard status lists. These included COSEWIC (June 2003), COSSARO (May 2003), NHIC (2003), Argus et. al. (1982-90), OMNR (1993) and Cuddy (1991).

### 3.2.4 Birds

Breeding bird surveys were conducted on June 12<sup>th</sup>, July 9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup>, 2003. Surveys included a combination of point count and wandering transects and covered all portions of the property and all habitats. The surveys were focused in the proposed plan of subdivision area but incidental observations were recorded for northern portions of the site. Nests of colonial waterbirds and ospreys were also noted.

A breeding bird species list was generated from the Atlas of the Breeding Birds of Ontario (Cadman et. al., 1987 and OBBA, 2002) for the 10 x 10 km atlas squares (18UR75) that contains the study area. Records of any vulnerable, threatened or endangered species were also solicited from MNR and NHIC.

Bird species significance on a national, provincial, regional and local level was based on published literature and current status lists. These included COSEWIC (June 2003), COSSARO (May 2003), NHIC (2003) and OMNR (1993 and 2000 updates).

### 3.2.5 Herpetozoa

Incidental observations of reptiles and amphibians were made during the site visit. Species significance on a national, provincial, regional and local level was based on COSEWIC (June 2003), COSSARO (May 2003), NHIC (2003) and Oldham (1996).

### 3.2.6 Mammals

Incidental observations of mammals were made during the site visit. Observations included direct sightings and indirect evidence such as calls, tracks, scat, burrows, dens and browse. Deer trails and wildlife corridors and linkages to adjacent areas were also noted and mapped.

Species significance on a national, provincial, regional and local level was based on COSEWIC (2003), COSSARO (2003), Dobbyn (1994) and Sutherland (1994).

## 4.0 Resource Inventory

### 4.1 Fish and Fish Habitat

#### 4.1.1 On-site creeks

The only fish captured during two method sampling of all the stream crossings in the study area were five (5) northern redbelly dace (*Phoxinus eos*). The presence of this fish species, as well as the general habitat features observed indicate that creeks in the study area could only support a warmwater fishery.

The section of the creeks within the study area were broken into “reaches”, or sections of differing stream pattern and characteristics. Site reach descriptions are numbered following the proposed crossings (C1-C6) (see Figure 2).

#### Stream Crossings C1 to C4

Crossings C1 to C4 could not be fished extensively due to the intermittent nature of the streams. Most creek channels were dry at the time of the field visit (July 7 to 10th, 2003), or had isolated pools with minimal flow (less than 5 cm of water) connecting them.

Stream Crossing C1 was a meadow marsh in a heavily used cattle pasture. The channel lacked definition and showed no signs of banks, flow or alluvial substrate. Canopy was almost 100 percent open in this section, and the shallow wetted areas supported dense cattail growth. No water of sufficient depth to survey was found in this open pasture section (Photo 1).

Immediately downstream, the channel pattern changed abruptly as the stream course entered a wooded ravine leading to Stream Crossing C2. The channel pattern became well defined with a riffle pool morphology and flowed for 60 m through a small forested valley. Overhead cover was approximately 75 to 100 percent full shade. Instream cover included boulders and overhanging vegetation. No instream vegetation was present. Water clarity was extremely clear and visibility was good to the stream bottom, which consisted of gravel and sand. Depths were shallow at the time of field visit (20 cm maximum in pools) and minimal flow was present. Although not a formal crossing, two minnow traps were set overnight in an attempt to assess fish use of the habitat connecting C1 and C2. No fish were captured or observed.

C2 was a narrow connection between two small forb marshes. Downstream of the crossing, C2 had a narrow (30 cm wide) channel that was dry at the time of survey and dense with cattails and reed canary grass (Photo 2). Upstream of the crossing, no channel was observed as the channel diffused into a small forb marsh.

C3 was an extensive forb marsh running through an active cattle pasture. It had no defined channel, no flow and no banks or alluvial substrate present and showed great impact from livestock entering the watercourse. The substrate was approximately 40 cm of muck churned up by livestock (Photo 3). Upstream the watercourse passed through a forested section of the property, where the channel had definition at Stream Crossing C4, but C4 was dry at the time of survey. The bottom in this section consisted of sands and gravels, sloping banks were present and overhead cover was approximately 80 % (Photo 4).

Upstream of C4 - Five (5) northern redbelly dace (*Phoxinus eos*) were captured in an isolated pool (Photo 5). As they are a common fish species of beaver ponds, they were likely washed over the beaver dam approximately 25 m upstream (Photo 6), as opposed to traveling upstream from Bob's Lake. However, their presence in the upstream section of this system and lack of barriers downstream means that crossings C1 to C4 must be considered as potential seasonal fish habitat for minnow species.

#### Stream Crossings C5 to C8

C5 was located at the eastern end of a large meadow marsh flooded by beaver activity. The crossing will be located where a small watercourse enters the wetland. At the time of the surveys the wetland contained no standing water. A defined channel approximately 80 m upstream cut through an incised valley with rock substrate before entering a series of small beaver floodings and narrow meadow marshes. Although a defined watercourse (30 cm wide) was observed in the meadow marsh including at the crossing location, no water was present. The channel substrate was silt and gravel (Photo 7).

C6 was located downstream of C5 at the outlet of a large meadow marsh and upstream of the existing Alder Road crossing. A beaver dam at the outlet created a small shallow flooded area. Downstream of the dam the watercourse passed through a narrow gap in the rock outcrops and through an old wooden beam culvert. This culvert had been replaced recently. The channel then flowed through two small beaver floodings with 5 m elevation changes and greater than 2:1 slopes between before

entering the lake (Photo 8). No fish were observed in the channels or the beaver floodings..

Although not a formal crossing, a small watercourse upstream of both C5 and C6 located at a newly constructed road crossing on Alder Road was surveyed to assess potential fish populations upstream of the wetland. The culvert on the south side of Alder Road was hanging by 5 cm on the morning of July 7<sup>th</sup>, but heavy rains that night caused the water level to rise to the culvert's lip by the morning of July 8<sup>th</sup>. The south side of this crossing was a small (50 x 50 m marsh) that acts as the headwater pond. It was cut off from connection with any upstream water bodies by steep surrounding slopes. The north side was a moderately deep and wide channel (average 1 m wide, some pools of 50 cm depth) that spread into large wet pockets to create a 15 - 20 m wide flooded area with dense wetland vegetation. This small open clearing changed abruptly to a small shallow pond heavily used by frogs. The pond was likely larger in the past, as evidenced by the drawdown from the riparian vegetation edge and the presence of a blown beaver dam at the north end of the pond.

Downstream of the blown dam, the stream morphology changed abruptly once more and became an incised stream channel down a steep forested ravine. There was no water or flow at the time of the survey. Flat angular rock was distributed throughout the dry channel and it exhibited step-pool morphology with a 1 m drop at the forest edge downstream. A short 15 m section leading from this gradient barrier exhibited a low gradient stream bed, with some gravel in the bottom. Small ponded areas of water (5 cm maximum) were connected by minimal flow that lead directly to the wetland downstream (Stream Crossing C5). No fish were captured in the overnight minnow traps set at the culverts and the pond, nor during the 890 seconds of electrofishing of the wetted areas of the site. However, the pond was good amphibian habitat as evidenced by the numerous frogs and tadpoles observed and by the mudpuppy captured in the isolated pool at the northern culvert. As with the other crossings located along the proposed subdivision road paralleling Alder Road, the impacts of livestock access were substantial and widespread. Although the gradient barriers downstream at Bob's Lake are not as prohibitive as elsewhere along the shoreline, this crossing is still unlikely to provide fish habitat on even a seasonal basis. An extensive and active beaver dam on the upstream side of Alder Road has created an alder swamp and blocked downstream flow at stream crossings C7 and C8. Small areas of standing water were present downstream of Alder Road, but the short section of defined

channel was only 10 cm wide and exhibited minimal flow. After approximately 5 m, the channel lost definition and dispersed into a small low lying seasonally flooded area with cattle tracks evident throughout (Photos 9 and 10). No fish were captured in minnow traps set overnight in the beaver pond, and fish would not be able to access this area from Bob's Lake on a seasonal basis as the gradient at the shoreline was approximately 2:1. No fish were captured at any of the stream crossings along the proposed subdivision road that parallels Alder Road in spite of two-method sampling at suitable locations. Due to the significant gradient barriers at the Mud Bay shoreline, lack of connectivity of the channels and the historical impact of livestock, the stream crossings at C5 to C8 do not seem capable of supporting viable fish populations on either a permanent or seasonal basis.

Overall, the watercourses associated with crossings C1-C4 are considered fish habitat. The watercourses associated with crossings C5-C8 do not seem capable of supporting viable fish populations on either a permanent or seasonal basis.

#### 4.1.2 Mud Bay- Bob's Lake

The East Basin of Bob's Lake has a mean depth of 17.4 m and a maximum depth of 25.6 m. Mud Bay was the westernmost bay in the East Basin of Bob's Lake, and with a 6 m metre maximum depth, was one of the shallowest sections of this basin. Bob's Lake was inhabited by smallmouth bass, largemouth bass, northern pike, walleye and lake trout, as well as a variety of forage fish such as rock bass. The East basin once supported a natural population of lake trout, but due to the collapse of this fishery in the 1960's, the MNR has been stocking the East Basin on an annual basis. 75,000 lake trout have been stocked in the East Basin since 2000. Even so, lake trout are not considered common in the east Basin, and it is thought they prefer the deeper waters of the West Basin ( mean depth 11 m, maximum depth of 24 m (Marleau, 2002).

The shoreline of Mud Bay was assessed by boat survey on June 12<sup>th</sup>, 2003 and found to provide good habitat for littoral zone species such as centrachids (sunfish and bass). The dominant bottom substrate was boulder and cobble with very little gravel, sand or silt present. No active or inactive bass or sunfish nest were observed in the study area. The water was tannic and very dark, such that the bottom was not visible in most areas within 2 m from shore. This is also attributable to very steep drop offs (ranging from 3 to 6 m) present along the shoreline in the study area. Aquatic vegetation was scant

to absent. Otherwise, a good diversity of habitat features were present and included small and large woody debris, old beaver caches, boulders, undercut banks and overhanging vegetation. Banks varied from gradually sloping, to areas showing small undercutting and many areas of steep rock faces (to a maximum of 15 m in height). The riparian vegetation present was also variable, in that in some areas, the shoreline was 100 percent open, with no shoreline vegetation present and in other places, mature trees grew right at the water's edge, with a full understory of pole and sapling trees, shrubs, ferns and vascular plants. Baseline water chemistry data was collected at the proposed Lot 1. Water temperature was 25.8 degrees C, conductivity was 0.14 ms/cm, total dissolved solids were 0.07 g/l and pH was 8.4, all within normal ranges for aquatic life.

#### 4.1.3 Crow Lake

Crow Lake has a surface area of 436.4 ha, a perimeter length of 17 km, a mean depth of 14.5 m and a maximum depth of 38.1 m (Marleau, 2002). Sportfish present in Crow lake are smallmouth bass, largemouth bass, walleye, northern pike and lake trout. Crow Lake was not included in the field survey of this study, as none of the proposed development abutted its shoreline.

## **4.2 Water Quality and Lake Capacity**

In completing our analysis no new, original data was used. Existing information from the Ministry of the Environment, the Ministry of Natural Resources and the Rideau Valley Conservation Authority were used. Specifically MOE/MNR (1993) and OMNR/DFO/PCRC/RVCA (undated) were used to provide information to allow the used of the Lakeshore Capacity Study or Dillon model (LCS, 1986).

In using this model several assumptions were made :

1. The number of development units identified in the literature were used for the model. No additional units were added except those proposed by this application.
2. Watershed phosphorus export coefficient used was that for an igneous watershed with forest plus pasture ( 9.8 mg/m<sup>2</sup>/yr).
3. A total of 24 trailer sites have been removed from Crow Lake (16 active

- sites plus 8 vacant lots).
4. An average of 70 cattle have been pastured on this property over the past 40 years contributing nutrients mainly to Mud Bay. This agricultural use will be discontinued.
  5. The percentage of seasonal to permanent use of units built on this property will be similar to that already on the lakes.
  6. The proposed development will result in an additional seven lots on Crow Lake (minus the 24 trailer sites) and twenty-six new lots on Mud Bay.

	Crow Lake (Oxic)		Mud Bay - Bobs Lake (Anoxic)	
	Existing	Future	Existing	Future
Phosphorus				
- Watershed	645 kg/yr	645 kg/yr	127 kg/yr	107 kg/yr
- Cattle			5.75 kg/yr	0 kg/yr
- Development	131 kg/yr	131 kg/yr	40.3 kg/yr	55 kg/yr
Total	777 kg/yr	776 kg/yr	173 kg/yr	161 kg/yr
Concentration				
- Predicted [P]	11 µg/l	11 µg/l	10.2 µg/l	9.5 µg/l
- Measured [P]	21 µg/l*		> 20 µg/l	
	9 µg/l **			
- Measured chl-a	1.8 µg/l		> 5 µg/l	
- Predicted chl-a	2.34 µg/l	2.34 µg/l	2.09 µg/l	1.88 µg/l

\* MNR/MOE 1992 data

\*\* OMNR/DFO/PCRC/RVCA

## Results

The LCS model used in this analysis significantly underestimates the concentration of phosphorus in both Crow Lake and Mud Bay of Bobs Lake. In Crow Lake the measured phosphorus concentration was 21 µg/l according to MOE/MNR (1993), whereas the predicted phosphorus concentration was 11 µg/l. The phosphorus concentration reported by OMNR/DFO/PCRC/RVCA was 9 µg/l, quite close to that predicted.

Mud Bay is reported as being eutrophic (MNR/DFO/PCRC/RVCA) which generally implies a phosphorus concentration greater than 20 µg/l and chlorophyll-*a* concentration greater than 5 µg/l. Predicted concentrations are 10.2 µg/l for phosphorus and 1.88 µg/l for chlorophyll.

Although the model appears to require substantial revision to the input parameters, it does consistently show that future conditions with the proposed development will lead to an improvement in lake water quality (Table X). Phosphorus was predicted to remain essentially unchanged in Crow Lake, however, that analysis does not include consideration of removal of cattle from the watershed. During our site visit cattle were observed to have had significant impact on both lake subwatersheds, most significantly on the Mud Bay area. For Mud Bay the model predicts a decrease in phosphorus concentration and chlorophyll as a result of this development. In fact this analysis may also underestimate existing impacts from cattle on this property. In addition to the phosphorus from defecation, which we estimated in this study, accelerated erosion caused by removal of vegetation through grazing and tramping may partially account for the observed high nutrient status of Mud Bay.

Since Crow Lake has been identified as a moderately sensitive lake trout lake, this impact analysis has been completed to address the requirements of the Official Plan for protection of such sensitive waterbodies. In addition the Official Plan requires a setback of no less than 30 metres and up to 90 metres from all bodies of water, depending on site conditions. In determining the appropriate setback for lots on both Crow Lake and Mud Bay a more detailed analysis of each lot is required to select the minimum allowable setback. Greater setbacks will be recommended where appropriate.

### **4.3 Vegetation**

A total of 220 plant species were identified on the property (Appendix 1). Twenty-one vegetation communities were identified by NEA on the property (Figure 2).

Vegetation community types included open pasture, dry-moist old field meadow, beaver ponds, alder thicket swamps, sedge meadow marshes, mixed forest, oak deciduous forest, sugar maple deciduous forest and savannahs. Cattle on the property

have had access to all portions of the property and all habitat types. As a result heavy grazing, trampling and trails were evident, particularly in the wetlands near the shore and open field areas.

In general the property was dominated by open pasture grassland and patches of deciduous forest in the northern portion. The central portion between Mud Bay and Crow Lake contains two large interconnected beaver ponds with active dams. The upland was rock outcrops with variable tree and shrub cover where soil was present. The southern portion of the property contained several wet meadows, beaver ponds, cattail marshes and riparian zones. The eastern part was a hilly area with steep slopes near the shoreline and a moderate aged deciduous forest dominated by white birch, red oak and sugar maple. The land to the west was predominantly open pasture with patches of red oak, American elm and meadows with juniper and rock outcrops. The western part of the shoreline to the property line contained variable forest cover dominated by young stands of American elm, white ash, sugar maple and red oak and scattered mature specimens of these same species in the meadows, rock outcrops and shoreline slopes.

A more detailed description of each community will be included in the final report.

#### **4.4 Birds**

A total of 45 species of birds were observed during the site visits. Species included a diversity of forest, field and lakeshore species. The forested areas harboured eastern wood-pewee, red-eyed vireo, black-capped chickadee, great-crested flycatcher, downy woodpecker and ruffed grouse. The edge habitats and tree stands within the fields contained indigo bunting, gray catbird, brown thrasher, common yellowthroat, house wren, eastern kingbird and brown creeper. The open fields contained savannah sparrow, eastern meadowlark, vesper sparrow, field sparrow and chipping sparrow. The wetland areas and ponds contained common yellowthroat, yellow warbler, wood duck, belted kingfisher, mallard, tree swallow and red winged blackbird.

A red-shouldered hawk was observed east of the property line from Alder Lane. Osprey and common tern were observed foraging offshore within Bob's Lake.

Three nesting areas were observed during the field visits. These included a single great-blue heron nest in the central portion of the property on the large southern pond,

a possible osprey nest in the wetland north of Alder Lane in the eastern portion of the property and a small colony of great-blue heron at the west end of the southern pond in the central portion of the property.

#### **4.5 Wildlife**

Mammal species observed directly or by identified from indirect evidence included white-tailed deer, eastern gray squirrel (*Sciurus carolinensis*), red squirrel (*Tamiasciurus hudsonicus*), eastern chipmunk (*Tamias striatus*), eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), woodchuck (*Marmota monax*), meadow vole (*Microtus pennsylvanicus*), and black bear (*Ursus americanus*).

Herptiles included northern leopard frog (*Rana pipiens*), American toad (*Bufo americanus*) and eastern garter snake (*Thamnophis sirtalis*).

### **5.0 Resource Significance**

#### **5.1 Natural Heritage Features and Functions**

A review of the Ontario Breeding Bird Atlas data (Cadman et. al., 1987 and OBBA, 2002) found that three vulnerable, threatened or endangered species (VTE's) have been recorded in the atlas square (18UR75). The species were bald eagle, cerulean warbler and prairie warbler. None of these species would find suitable habitat on the subject property. A literature review of the site found no nationally or provincially significant species, provincially significant wetlands, significant woodlands, significant valleylands, significant wildlife habitat, deer yards, Areas of Natural and Scientific Interest (ANSI's) or Environmentally Sensitive Areas (ESA's) (NHIC, 2003).

#### **5.2 Significant Species and Habitats**

A preliminary review of the plants, birds, mammals and herpetozoa identified by NEA for the site (Appendices 1-4) found that several were significant on a national, provincial or regional level (COSEWIC, 2003; NHIC, 2002, MNR, 1993, Riley,

1989). No significant vegetation communities were identified on the property (Bakowsky, 1997).

Species with some level of significance observed during field surveys included osprey, great-blue heron and red-shouldered hawk. The osprey is not listed as provincially significant but is considered a species of special concern and a managed species by MNR. The nest in the wetland was not active this season but may act as an alternate nest site.

The great-blue heron nest in the central pond was also not active but was on a stable tree and may be used in the future. The active colony was located outside of the development area and will be included within a open space area.

The red-shouldered hawk is listed as provincially vulnerable. The bird was observed east of the Alder Lane property line. A survey for a nest or suitable nest trees did not find any nests or trees on the property. More suitable habitat was present to the northwest of the property. The property may form part of the birds large foraging territory.

None of the other species documented in Table 1 are considered locally, provincially or nationally rare (COSEWIC, 2003) and COSSARO, 2003).

## 6.0 Description of Proposed Development

The proposed development includes large lots with single family houses/cottages with shoreline frontage on Mud Bay and Crow Lake. The detailed site plan prepared by McIntosh Perry should be consulted for lot locations and road layout.

## 7.0 Impact Assessment

### 7.1 Fish and Fish Habitat

The Mud Bay shoreline was very stable and provides amenities to the adjacent fish habitat. Careful changes to the terrestrial environment along this shore in terms of limited and carefully planned lots should have no impact on adjacent fish and fish habitat. Aquatic vegetative cover at the selected dock sites was scant to absent. The addition of floating or pipe docks will provide overhead cover and improve fish habitat. No overhanging trees, fallen trees, logs or stumps should be removed for the installation of docks.

The location of existing fish habitat should be included in the decision making process for the placement of floating or pipe docks . Water depth of 1 m (measured at the low water mark) is the normal accepted minimum for a floating dock and a dock approximately 2 m wide by 6 to 7 m in length is considered the minimum size for stability. Because a pipe dock is propped up on legs, it can be built smaller than a floating dock and still remain stable. The width of the dock should be at least 1 m and never less than the depth of the water. It can be extended as water depths permit. Water depths of over 2 m are considered too deep for pipe dock installation.

The fish species in Mud Bay will not be adversely affected by shoreline or dock construction as they are highly mobile species and for the most part tolerant to a wide range of environmental conditions. As such, there should be no adverse impact from dock placement at the proposed sites.

Although few fish were found within the inland portion of the property, beaver pond refugia were identified as supporting at least one species. Downstream areas may, therefore, be classified as seasonal fish habitat and disruption to these areas may require some form of compensation to ensure their continued use.

## 7.2 Water Quality

Due to the presence of adjacent significant fish habitat in both Crow Lake and Mud Bay, measures should be implemented to ensure erosion and the input of nutrients resulting from this development do not increase, and preferably are decreased. Due to the past history of cattle grazing on this property, achieving a net reduction of both sediment and nutrient addition to the lakes is achievable.

Especial measures will be needed during construction to ensure no construction related impacts. Long term nutrient and sediment additions will be achieved through the appropriate use of buffers, proper management of these buffers including revegetation where appropriate, and the proper siting and construction of the individual waste disposal facilities.

## 7.3 Vegetation

The development of the property will result in the loss of portions of the upland communities. The siting of building envelopes on the lots will be completed on a lot by lot basis incorporating shoreline setback requirements, septic setbacks and biological constraints. Due to the large size of the lots, the land to be cleared for a driveway, house and septic will be a relatively small percent of each lot. Building envelopes will be located close to the shoreline primarily in open field, disturbed forest and rock outcrop areas. The shoreline slope vegetation, wetland pockets and beaver ponds will be located outside of the development envelopes. If necessary crossings for driveways may impact on wetland pockets. The forested communities will be retained and will continue to provide slope stabilization and wildlife habitat. Cattle grazing on-site has resulted in cropping and removal of grasses, herbaceous plants, wetland plants, trees and shrubs over much of the property but particularly along the Mud Bay shoreline. The removal of the cattle will allow these areas to regenerate and successional meadows to recover.

There were no significant vegetation communities or sensitive habitats that would be impacted by the proposed development. The final design of the lots and driveway access will be completed in consultation with the appropriate resources agencies.

The site preparation and construction of the site will be the stage when impacts on these communities have the potential to occur. Mitigation measures and recommendations have been included in this report. Installation of snow and silt fencing at the outer limit of the tree branches (dripline) is critical to preserving the health of the mature trees.

## **7.4 Wildlife**

The development of the property will result in the loss of some wildlife habitat. Currently the property is heavily grazed with high disturbance from cattle trails. The species utilizing these habitats included deer and typical rural species. The site is part of a network of forest and lakes. The wildlife disturbance factors following development will include road traffic, cottage activities and minor noise and light. While there may be minor disturbance from seasonal use of the lots, a majority of the property will be open space with regenerating field and forest communities. The removal of cattle from the site will allow the fields to establish in early successional herbaceous species, trees and shrubs. The recovery of these communities will greatly increase the diversity and quality of the vegetation communities on site and consequently improve wildlife habitat.

Although there will be a loss of overall wildlife habitat area the species currently present will continue to find suitable habitat for foraging, cover, breeding and movement corridors within the proposed plan.

Regional and local wildlife corridors and linkages identified will be maintained post development.

Discussions with MNR regarding setbacks from the osprey nest and red-shouldered hawk nesting sites will be completed during the review process.

## 8.0 Conclusions

The development of the site as per the development concept plan will not have a significant impact on Bob's Lake, Crow Lake or on-site EP areas provided mitigation measures are implemented. A number of recommendations regarding the protection of fish habitat and wildlife have been made to minimize impacts during the site preparation, construction and post-construction period.

## 9.0 Recommendations

- 1) A detailed sediment and erosion control plan be prepared for the site preparation, construction and post-construction periods. Ditches and potential point sources of runoff flows should receive primary and secondary control measures.
- 2) Silt and snow fencing be installed along the shoreline and fish habitat buffers prior to any site grading or grubbing  
-Silt fencing should be properly installed and regularly inspected and maintained.
- 3) No construction activities or equipment crossings occur within the shoreline or creek buffers or impact erosion control structures.
- 4) Stockpiled materials (topsoil, subsoil and aggregate) shall be stored a minimum of 30 m from the shoreline buffer and creek channels and stabilized to prevent erosion.
- 4) Vehicle and equipment re-fuelling and/or maintenance shall be conducted a minimum of 30m from the shoreline and creeks.
- 5) Recommendations within the Stormwater Management Plan for the protection of the watercourses and post construction monitoring be followed
- 6) Wooded areas to be retained be staked and snow fencing applied to outer edge of branches (dripline)
- 7) Plantings within the subdivision, the shoreline buffer, fish habitat buffers and parkland should use native tree and shrub species and species similar to that of the adjacent woodlands.
- 8) Only dock sites mutually agreed upon through consultation with the appropriate agencies shall be constructed.

- 9) Appropriate setbacks for building envelopes be determined through a lot by lot analysis including the factors identified in the Official Plan, which originated from the Rideau Lakes Study.
- 10) The types of docks suitable for development along this shoreline are pipe, cantilever and floating docks. These structures will provide habitat and may result in a net gain of fish habitat.
  - No in-water structures (stumps, logs and boulders) should be removed for dock construction.
  - Boat traffic should be restricted to non-motorized and small motorized craft to prevent sedimentation and destruction of aquatic vegetation. Boats should approach the docks and shoreline slowly to reduce potential wake effects.

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