

# Badour Farm Subdivision

## Plan of Subdivision

### Township of South Frontenac

## Response to Peer Review

### Introduction

We wish to thank the County of Frontenac for this opportunity to respond to their Peer Review consultants' comments on our EIA report. We believe that the review by Michalski Associates (MMA) was thoughtful and well intentioned. We believe that the following responses address the concerns identified. Should further questions or concerns remain we would like to suggest that a meeting to resolve our different opinions or at least identify areas where we cannot agree would be more productive than further memos.

### Aquatic Habitat

#### Assessment of Existing Conditions

Page 2, 1<sup>st</sup> paragraph. *Other sources that should be identified include Rideau Valley Conservation Authority (RVCA) and any local conservation groups (e.g., Kingston Field Naturalist Club).*

RVCA was referenced, as they were part of the production team of one of the key background documents, namely:

OMNR/DFO/PCRC/RVCA. 2003. Fish Habitat of the Tay River Watershed: Existing Conditions and Opportunities for Enhancement - DRAFT. A Report completed by K. Esseltine, Ontario Ministry of Natural Resources Kemptville and Kingston.

Although the Kingston Field Naturalist Group was not contacted directly, the Ontario

---

Breeding Bird Atlas (OBBA) was used as a reference for the bird studies. The Atlas derives the vast majority of its data from volunteer birders who are very familiar with their study squares.

2<sup>nd</sup> paragraph. *Ontario Base Mapping is not provided for review of drainage patterns for the subject property and no date is provided for the aerial photograph...*

Digital topographic mapping was supplied by McIntosh Perry for the property and surrounding lands and was used to identify watercourses and waterbodies. This mapping shows 1 meter contour intervals.

The airphotos were taken on April 12, 2003 at 1: 8000 scale.

3<sup>rd</sup> paragraph. *The exact numbers and locations of some of these features were not documented in the EIA, and should be noted.*

The study site is shown in Figure 1, outlining the sections of both the Bob and Crow Lake shorelines within the study area. Hilltop and Twin ponds are shown on Figures 2 and 3 of our report, but were not named until after our EIA was prepared.

Page 3, continuation of 3<sup>rd</sup> paragraph above. *No mention was made of critical fish habitat having been documented adjacent to the proposed shoreline lots on either lake, for example, have spawning/nursery habitats been documented to occur in these areas. It is unclear whether this information was unavailable or not mentioned in the EIA.*

Page 3 of our report states that Crow Lake was identified as a moderately sensitive lake trout lake and that the Mud Bay portion of Bob's Lake is not considered a lake trout lake. Page 5 of our report states that Bob's and Crow Lakes have been sampled in recent years and the results compiled as part of the Fish Habitat of the Tay River Watershed: Existing Conditions and Opportunities for Enhancement - DRAFT published in June of 2003. As our fish survey was also conducted in June of 2003, we did not see the need for further fish sampling.

The Mud Bay shoreline of the study area is shown on Figure 2.3.2 of the above report. Pages 50 and 51 of the above report outline Critical Fish Habitat in Bob's Lake as

---

follows:

- No documented walleye, bass or northern pike spawning or nursery habitats on the Mud Bay shoreline within the study property boundaries.
- As mentioned previously, Mud Bay of Bob's Lake is not considered a lake trout basin lake and no known spawning shoals exist.

The Crow Lake shoreline of the study area is shown on Figure 2.3.5. of the report. Pages 52 and 53 of the above report outline Critical Fish Habitat in Crow Lake as follows:

- Eight (8) lake trout spawning shoals exist on Crow Lake, but none are within the boundaries of the study property. The only one of the eight in the vicinity of the study area is on the eastern shore of Crow Lake, adjacent to Crown Land, and approximately 400 m south of the study property boundary. As such it should not be affected by the proposed development, particularly with the designed 30 m or larger buffer.
- No documented walleye or bass spawning or nursery habitats on the Crow Lake shoreline within the study property boundaries.
- The potential pike spawning location documented on page 53 of the above report is explained at length on page 9 of our report. Although this spawning record was found not to be reliable, the tributary will be included as part of an open space block as per the Preliminary Subdivision Plan (McIntosh and Perry, September 2003).

Therefore, critical fish habitat was addressed in our report, however, none exists within the study area.

Please note that on page 52 (and elsewhere) of the above report, under Fish Habitat Enhancement Opportunities, it is recommended that "Practices that decrease nutrient and sediment loading should be strictly followed (i.e., shoreline buffers, restrict livestock access, monitor cottage septic systems, etc.)." A buffer of at least 30 metres is recommended for all permanent watercourses in the study area, and cattle have already been removed from the area, fulfilling two of the above recommendations.

Page 3, continuation of 3<sup>rd</sup> paragraph above. *The written comments of the shoreline survey provide only limited insight in terms of a critical habitat assessment of the shoreline as related to the areas fisheries potential.*

We conducted our field work the very month the most up-to date Tay River watershed report was produced. Critical fish habitat was not documented within the study property in this summary and we did not see the need to conduct further in-depth assessments. Our observations and assessment of the Mud Bay shoreline concurred with the above document, in that no active or inactive centrarchid nests were observed and the hard substrate and lack of aquatic vegetation provided very little in terms of fish spawning or nursery habitat to local fish populations (pages 12 and 13 of our report). Regardless, all fish habitat should be adequately protected with the proposed minimum 30 m buffer.

Page 3, continuation of 3<sup>rd</sup> paragraph above. *Temperature and dissolved oxygen data were not mentioned, and would be useful in confirming the comments that the ‘creeks in the study area could only support a warmwater fishery’.*

Page 8 of our report states most of the creek channels at the stream crossing sites were dry at the time of the field visit, or only had isolated pools with minimal flow (less than 5 cm of water) connecting them. Any water chemistry data collected would not be representative in such small pockets of water. The warmwater fishery assessment was therefore based on habitat characteristics, such as channel morphology, soft substrata on the creek bottoms, cattails in the channel at several stream crossing sites, and lack of permanent flow in the creeks (no groundwater present).

Page 3, continuation of 3<sup>rd</sup> paragraph above. *Some data were provided in the report on the fishbearing status of some of the ponds, but did not include information for either of the two larger ponds, Hilltop and Twin ponds.*

Hilltop Pond was not surveyed as it was assumed to be fishbearing by connection. Pages 9 and 10 of our report reference fish capture upstream of crossing C4. We stated that the five (5) northern redbelly dace captured in an isolated pool were likely washed over a beaver dam approximately 90 m upstream. This beaver dam is located at the outlet of Hilltop Pond. As northern redbelly dace are common inhabitants of

---

beaver ponds, we assumed Hilltop Lake was fishbearing. Twin Ponds were not surveyed as no construction was proposed for this part of the study property.

### Assessment of Resource Significance

Page 5, 2nd paragraph. *There is no discussion of the significance of the fish and fish habitat documented on or adjacent to the subject property for either the lakes or the watercourses in Section 5.0.*

Fishbearing status of the creek systems is summarized in Table 1, Section 4.1.1 and commented on in Section 7.1 (last paragraph). An assessment of the aquatic resources of Mud Bay is given in Section 4.1.2 and again in Section 7.1 (first paragraph).

Contrary to the reviewers' comment that these resources are *undoubtedly of significance*, the creek channels found on the study property were intermittent and/or dry, providing marginal, seasonal habitat at best (Stream Crossings C1-C4), while the remaining crossings (Stream Crossings C5-C8) were ill-defined channels heavily impacted by livestock, that also exhibited lack of connectivity to surrounding waterbodies. Downstream gradients to Mud Bay were also prohibitive to fish passage and use. As such, they do not seem capable of supporting fish populations on even a seasonal basis. Mud Bay supports a warmwater sport fish community, but has no species of special concern. The Crow Lake coldwater species will be adequately protected by the 30 m or larger buffer and by the recommendations made in Section 9.0 of our report.

With regard to the reviewer's comments that all fish habitat is protected under the federal Fisheries Act, please note that all fish habitat documented on or adjacent to the subject property, including marginal and/or seasonal fish habitat, has been protected by the proposed 30 m or greater buffer and by the recommendations made in Section 9.0 of our report.

### Evaluation of Potential Development Impacts.

Page 6, 3rd paragraph. *Limited information was provided on the location of critical fish habitat along the shoreline abutting Bob's and Crow Lakes.*

No critical fish habitat was documented on either shoreline.

*Page 6, 4<sup>th</sup> paragraph. No impact assessment of fish and fish habitat was completed for these water bodies in terms of required road/driveway crossings and building envelopes.*

Fish and fish habitat was identified and assessed in our report. At the time of our impact assessment no design details of road crossing had been finalized. We commented on the locations of the crossings in terms of avoiding fish habitat. We also made recommendations (Section 9 of our EIA) for the mitigation of any impacts to fish habitat. (See specifically Recommendations 1, 2, 3, 4, 5, 6, 9, 11, 12 and 13).

## Water Quality

### *Peer review Page 3*

We agree with MMA that the LCS model used in our analysis poorly predicts the existing conditions in either Mud Bay or Crow Lake. This is partially due to the lack of adequate water quality data for either lake. In fact we noted this poor agreement between predicted and measured data in our report (page 15). We are also in agreement that additional data, re-calibration of the model and application of amendment to the model could be completed. Due to the paucity of data on Mud Bay and, to a lesser extent Crow Lake, we believe completing such an exercise would require:

1. collection of additional water quality data from both lakes over a minimum of at least one season
2. an accurate delineation of the number of cottages/homes on each body of water and the location of their septic systems
3. more detailed information of soils in both watersheds
4. incorporation of wetlands into the model
5. estimation of phosphorus retention in shallow lakes
6. calibration of anthropogenic phosphorus sources
7. incorporation of phosphorus retention by soils

- 
8. consideration of distance of development from shorelines
  9. revising the per-capita phosphorus contribution
  10. validation of phosphorus usage figures

and

11. consideration of other sources of phosphorus.

All these factors are described in the paper provided by the peer reviewer (Hutchinson *in France*, 2002).

Our approach was to ignore the lack of agreement between phosphorus concentration predicted by this model and measured values, and instead, focus on the changes resulting from this proposed development on loadings to each lake. To complete the studies required to construct a model sufficiently calibrated to reflect actual conditions in both these lakes would, result in significant delays and costs to the owners of this property. Responsibility for such lake models generally rests with the municipality while developers are responsible for demonstrating that their project will either not exceed guidelines or will result in an improvement to existing conditions. Since we did not rely on the LCS model, we did not provide the little water quality data available. We agree with the reviewers that good water quality data is necessary to reliably calibrate the model, but in this instance, it is not available. That is why we chose a different approach, specifically to show that the proposed development would result in an improvement of water quality, regardless of its' present state.

In our case we chose to look at only the effect of the replacement of two land uses (cattle pasture and trailer park) with another (residential development).

MMA correctly point out our lack of explanation of the number we derived for the calculation of cattle impacts in terms of nutrient input. The equation we used was:

Nutrient loading per urination(or defecation) X the probability of a single cow urinating (or defecating) in the water X the number of watering events per day X the number of cows with water access X the number of days per growing season X the total number of cows with water access.

This equation was taken from Demal et.al. (undated). This reference is provided in our EIA References section. The actual numbers used for each lake were:

nutrient loading per urination (or defecation) = 1.2 gm P

probability of a single cow urinating (or defecating) in the water = 17.9 %

number of watering events per day = 2.5

number of days per growing season = 153

total number of cows with water access = 30

The calculation results in an estimation of 2.465 kg/yr (see table 2, our EIA report).

We note that this calculation was developed on a model calibrated for southwestern Ontario agricultural farms and ignores the possibility of cattle defecating on the shoreline and the resultant loading from runoff. In the case of this property the probability of runoff is greatly exacerbated by the steep shoreline and shallow soils. As such this model probably underestimates the true impacts of cattle on this property affecting the nutrient state of the lakes. The model also ignores the impact of accelerated erosion resulting from the cattle disturbing the shoreline vegetation.

Finally we agree with the peer review consultant who states that if the appropriate setbacks from the Rideau Lakes study methodology are incorporated into the plan of subdivision there will be no trophic state impacts. In fact these setbacks have been reviewed by the Rideau Valley Conservation Authority and they have acknowledged “*Analysis using criteria (slope, soils type and depth and vegetation) from the Rideau Lakes Study was calculated and verified for each proposed lot.*” This makes the need for the expense and delay inherent in calibrating and verifying the LCS model, prior to consideration of this development application, even more redundant.

## Vegetation

### Vegetation-Assessment of Existing Conditions

---

Page 4: a table summarizing ELC's that correspond to the Figure 2 vegetation community labels... would be helpful. The following table presents this data.

| Community No. | ELC classification - vegetation type       | ELC code | General description  |
|---------------|--|----------|--|
| 1             | dry-fresh sugar maple-oak deciduous forest | FOD5-3   | Deciduous forest dominated by sugar maple with basswood, beech, red oak and yellow birch       |
| 2             | shoreline                                  |          | Small wet low banks at water line with blue flag, marsh fern and dogwood                       |
| 3             | bluejoint mineral meadow marsh             | MAM2-1   | Headwater tributary marsh with Canada bluejoint and purple loosestrife.                        |
| 4             | reed canary grass mineral meadow marsh     | MAM2-2   | Beaver flooding with reed canary grass and cattail dominant. Dead cedar and hardwoods present. |
| 5             | bluejoint organic meadow marsh             | MAM3-1   | Marsh with Canada bluejoint, sedges and woolgrass.   |
| 6             | speckled alder organic thicket swamp       | SWT3-1   | Marsh used by cattle for water. Alder thicket swamp with little understory due to trampling.   |
| 7             | narrow leaved sedge organic meadow marsh   | MAM2-5   | Isolated wetland dominated by sedges and deep organic soils. Variety of wetland plant species. |
| 8             | speckled alder organic thicket swamp       | SWT3-1   | Beaver flooding dominated by speckled alder and slender willow.                                |
| 9             | Twin ponds                                 |          | Open pond with emergent vegetation along shore and floating plants.                            |
| 10            | Hilltop pond                               |          | Large beaver flooding with emergent vegetation along shore.                                    |

|    |  |        |  |
|----|--|--------|--|
| 11 | pasture  |        | Heavily grazed pasture with scattered trees on steep slopes and shoreline.   |
| 12 | dry-fresh sugar maple-white ash deciduous forest | FOD5-8 | Young and moderate aged deciduous forest with sugar maple, white ash, red oak, basswood and elm.                                       |
| 13 | reed canary grass mineral meadow marsh           | MAM2-2 | Low lying area with reed canary grass.   |
| 14 | bluejoint mineral meadow marsh                   | MAM2-1 | Two wet meadow marshes with reed canary grass and Canada bluejoint.  |
| 15 | dry-fresh sugar maple deciduous forest           | FOD5   | Ravine and laneway with mature sugar maple.  |
| 16 | hay field  |        | Active hay field.  |
| 17 | bluejoint mineral meadow marsh                   | MAM2-1 | Wetland on headwater tributary with bluejoint and purple loosestrife ( <i>Lythrum salicaria</i> ).                                     |
| 18 | rural  |        | Hedgerows, thickets and meadows surrounding existing cottage lots.   |
| 19 | mixed forest                                     | FOM    | Woodlands of second growth deciduous and mixed forest.   |
| 20 | dry-fresh white birch deciduous forest           | FOD3-2 | Large portion of property with white birch forest. Other species such as oak, pine and spruce. Diverse understory of ferns and asters. |
| 21 | pasture  |        | Heavily grazed open pasture on north portion of property.  |
| 22 | bluejoint mineral meadow marsh                   | MAM2-1 | Meadow marsh east of Hilltop pond dominated by reed canary grass.  |

Plant rarity at local level

There are no local reference lists for this area of Frontenac region.

Table 1 (page 4, 4<sup>th</sup> paragraph)

The reference to Table 1 on page 25, section 5.2 should refer to Appendix 3, List of Breeding Bird Species.

## Wildlife

Wildlife Corridors (page 4, last paragraph)

The location of the property between two lakes and the local corridors present is described in section 7.4. In a regional context, a 1 kilometer wide landmass between Crow and Bob's Lake which includes the property at the north end (see Figure 1 in the report) would funnel wildlife between the two lakes. Blocks 38-40 follow ridges, wetlands and the shorelines of the ponds that provide open space and natural corridors. Wildlife using this corridor for movement utilize the shorelines and the interior. The main regional wildlife corridors exist west of Crow Lake and east of Bob's Lake.

The habitat assemblages to the north and south of the property are similar with second growth woodlands and pocket wetlands. There are no specific significant natural heritage features within 5 km of the property, including between the two lakes that would act as core areas for wildlife. Linkage of core natural areas is important for maintaining wildlife populations.

Assessment of Resource Significance Page 5

The EIA states that there are no significant vegetation communities on the subject

---

property (Bakowsky, 1997).

The diversity of habitat types on the property included 22 vegetation communities including meadow marsh, thicket swamp, deciduous forest, mixed forest and ponds. The rolling topography, Shield rock outcrops and shoreline slopes create a diversity of microclimate and soil conditions for plants and trees to inhabit. The highest diversity of plants were found in the deciduous forest and wetland communities.

The presence of a diversity of small habitat patches and predominance of edge habitats allows for a higher number of breeding bird species and mammals that utilize these habitat types. Most of the bird species are generalists or edge species that take advantage of thickets and patchy forest cover. Seventeen species are considered area sensitive species. These same species are also listed as forest interior species. They require large contiguous forest blocks and prefer interior portions greater than 100 m from the edge. These species of birds were found primarily in the contiguous forest on the eastern and central portion of the property (communities 1, 12, 15, 19 and 20). These communities were not restricted to the subject property but stretched to the east to Badour Road. The concentration of area sensitive species in these larger communities is a function of the size of the woodlands and lack of disturbance in a majority of the community which is not grazed by cattle on the adjoining properties.

The locations of the osprey and heron nests are provided in our EIA on Figure 3. These are the key critical wildlife habitat features on site. Other observations of the presence of species are described in text form. Since many wildlife species are mobile we describe the habitat where they occur rather than designate a specific location. On a different day the species could quite probably be in adjacent suitable habitat, therefore the location of specific features such as nests or dens are mapped but observations of transient habitat use only described in text form.

The presence of the shoreline and interior wetlands and ponds adds greatly to the diversity and allows a wider range of species of plants and wildlife that require wet conditions and both aquatic and terrestrial habitats. The number of amphibians documented including blue-spotted salamander (community 17) and mudpuppy (community 3) was due to the presence of pocket wetlands and creeks.

While a diversity of species and communities were present, there were no

---

communities that are considered particularly significant or sensitive.

*Description of proposed development Page 5 last paragraph*

The development plan has a 30 m minimum for a setback along the shoreline of Bob's Lake and Crow Lake. Building envelopes will be located outside of the 30 m but facing the water. The lake side of the lot will be left in its natural state. The topography of the lots with steep slopes, wetlands and rock outcrops create physical constraints to construction of driveways, homes and septic beds. The driveways will be one lane and follow the existing topography and gradual slopes. The building envelope will not occupy more than 30 x 50 m on a typical lot. This equals approximately 15% of the lot area on the smallest shoreline lot.

Evaluation of Potential Impacts

*Upland Page 6 last paragraph*

The loss of portions of the upland communities will occur as a result of building envelopes and driveways. As well, construction of interior roads has and will result in additional tree clearing. The portions of the vegetation communities along the shoreline within the 30 m or greater setback will be preserved. Large mature trees are associated with the steep shoreline slope and the setback. The building envelopes of lots 1-4 and 11-16 will remove some forest cover in communities 1 and 12. The impact on the forest will be minimal as the building envelopes are small. The loss of tree cover will not result in a loss of forest interior habitat as the building envelopes are at the top of bank and within 60 m of the forest edge at the shoreline. There will be no impact on the area sensitive species identified. While the trees in the building envelope and driveway may be used for foraging, they constitute only a portion of each pair of bird's territory or home range. Driveways will be narrow and winding to accommodate lower grade slopes and avoid large mature trees and wetlands.

The interior lots 22-23 and 27-35 are located in forested areas. The building envelope will be located on upland areas where slopes allow. The cutting of the building envelope will open the forest. Due to staggered nature of the building envelopes on each lot and the size of the lots, there will be substantial tree cover retained between envelopes. This will create scattered openings in the forest but it will retain the

corridor, wildlife habitat and interior forest functions and not have a significant impact on the forest.

The lots on Crow Lake are located on a former trailer park site. Disturbance in this area has already occurred. The scattered nature of successional thickets and forest cover will not be altered by the building envelopes for the new lots.

Wetlands Page 6 last paragraph

The building envelopes and driveways will be located outside of the pocket wetlands and riverine wetlands on the property. Where crossings of wetlands are required, maintenance of existing flow regimes will be maintained by installing culverts. This will occur on lots 7, 8, 14 and 24 where pocket wetlands are present. Driveways will be located to avoid crossing wetland habitats to minimize impacting the wetland hydrology and ecological features. A number of large wetlands in the eastern and northern portion of the property and the Twin Ponds and Hilltop Pond are located outside of the development areas (lots). Blocks 38, 39 and 40 are proposed for common ownership that will encompass these features.

New Road construction

The access road proposed crosses several wetland areas including community 4, reed canary grass mineral meadow marsh. The crossing will require fill to be placed and a net loss of wetland area. However the flow regime will be maintained by a culvert to allow existing flow south to Bob's Lake. The loss of wetland area will not be significant. The wetland is a beaver pond that has drained and is succeeding into meadow marsh. The habitat is similar throughout the wetland with some ponding at the proposed crossing. The loss of the habitat for the road footprint will not impact on the features and functions of this wetland. The wildlife habitat, amphibian habitat and use as nesting, foraging and roosting site for a variety of birds, mammals and amphibians will continue after construction.

The access road will be utilized by residents of the shoreline lots with no public access to the lake. The volume of traffic is expected to be low with low speeds due to the curves on the road. The main concern of new roads through forested areas is loss of wildlife habitat, loss of interior forest habitat, increased access to parasitic bird species and nuisance mammals, road mortality and disruption of wildlife corridors.

The road access proposed follows the outer edge of several forest and wetland communities but is primarily located on pasture lands. Due to the high level of disturbance in these areas, impacts on the functions listed above is not expected. The two areas where roads will be cut into forest communities are at the western end of the road and on the cul-de-sac at the southeast corner of the property. The clearing of trees for the western end will be to widen the existing road across the property. Widening of the existing road will not add to the disturbances and impacts already present. The cul-de-sac construction will result in a loss of forest cover, but similar to the building lots for the lots fronting on this cul-de-sac, the area is small. Traffic volumes will be low and not disrupt migration and movement corridors across the road and on the lots to the south.

### Recommendations to Mitigate Impacts

#### *Page 7 – 1<sup>st</sup> bullet*

Recommendations 9, 11, 12 and 13 in Section 9.0 of our EIA address potential constraints and processes for dock construction. Recommendations 1, 2, 3, 4, 5, and 6 address fish habitat. At the site plan stage of this development application more specific mitigation measures could be specified.

#### *Page 7 – 2<sup>nd</sup> bullet*

We agree these guidelines exist and should be addressed at the site plan stage.

#### *Page 7 – 3<sup>rd</sup> bullet*

We agree and ongoing discussions with RVCA have already addressed many of these issues.

#### *Page 7 – 4<sup>th</sup> bullet*

Recommendations 1, 2, 3, 4, 5, and 6 address mitigation measures and call for the preparation of erosion and sediment control plans. This is appropriate for the site plan stage of this development application.

*Page 7 – 5<sup>th</sup> bullet*

Construction and location of septic beds have already been discussed with RVCA and the health unit.

*Page 8 – 1<sup>st</sup> paragraph*

We agree that monitoring is appropriate. We anticipate that specific monitoring requirements will be a condition of draft approval.