EEPAC REVIEW: MUD CREEK SUBWATERSHED EA/EIS

Review of: **Mud Creek Subwatershed Class Environmental Assessment Draft Report and Environmental Impact Study**

Reviewers: Kat Doughty, Caitlin Kushnir, Lauren Des Marteaux, Natalie St. Amour, Michael Thorn
London's Environmental and Ecological Advisory Committee (EEPAC)

Date: Aug 25, 2016

The document under review is an Environmental Assessment (in draft) for the Mud Creek Subwatershed. It also includes a combined Subject Lands Status Report/Environmental Impact Study, a fluvial geomorphology assessment, an archaeological assessment, and hydrologic and hydraulic modelling. The purpose of the assessment is to reduce erosion and sedimentation within the channel, mitigate flooding, and protect and enhance the natural heritage features. The preferred Alternative 4, proposes to deepen, widen and realign sections of Mud Creek, enlarge the CNR culvert, and relocate the Oxford Street culvert. Although Alternative 4 will involve removal of trees and disturbance of wildlife species and habitat, EEPAC feels it is the best option for addressing flooding concerns and enhancing the ecological features and functions of Mud Creek corridor. Overall, the report is well-written, thoroughly addresses the impacts expected, and provides detailed outline of the mitigation efforts proposed.

Some additional issues are noted below:

General Comments:

- Some areas zoned for development (e.g., residential, north of Oxford Street) contain significant woodlands along the Mud Creek tributaries. These are also within the existing and future regulatory floodplains. New development should not be in these areas. Development plans should consider adequate buffer zones to protect woodland areas and incorporate LID opportunities in building design.
- Whenever possible, avoid cutting down trees during construction of culverts and renovation/relocation of Mud Creek by finding flexible ways to incorporate the trees' location into the design plan. Reducing negative impacts due to disturbance is key, and so retaining as much of the existing native vegetation is important, especially in preserving wildlife habitat and saving mature trees which take many years to grow. For example, when creating access roads, look for options to deviate to the side of mature trees rather than cutting it down and follow path of lower tree density. Another example would be to transplant native trees (small trees should be doable) to a nearby location within the corridor instead of cutting it down. A third example, where tree revetments are planned, is to leave original trees intact whenever possible, which will provide better bank stabilization. Fourthly, make all attempts to protect the vegetation communities on slopes, especially along both sides of the CNR tracks during construction of the culvert.

- Ensure that the renovation and revitalization of Mud Creek improves corridor function and linking to Thames R. Compensation plan to replace the removal of woodland should be aimed at enhancing this corridor. In addition, in compensating trees 3:1 that the species of trees being replaced be appropriate to the environmental conditions of the location, and also to consider replacing the same type of vegetation communities (especially if it contains native and rare plants and promotes diversity) that were affected during construction.
- Show a map that identifies areas of woodland and/or mature trees proposed for removal. This would visually clarify what vegetation communities are affected in the construction.
- Ensure that wildlife and nests are safely moved. Check for cavities, etc. Ensure adequate compensation, especially in removal of habitat known to contain SAR species - that these are replaced and/or moved according to protocol. Place bat boxes and other wildlife habitat installations before construction.
- EEPAC supports the monitoring plan proposed, and should include water quality measurements.

Specific Comments:

Mud Creek Subwatershed Class Environmental Assessment

- Maps showing the preferred Alternative 4 alignment of Mud Creek at the CNR crossing does not seem to reflect the proposed shift for the enlarged CNR culvert. Although the shift is small compared to the scale of the map, Alternative 4 planform is straight going into the CNR culvert (e.g., Figure 6-7), but the plan (Figure 7-1) creates more of a bend in the creek, and would cut through woodland. This difference is especially noted in Figure 6 map showing both the alternative and existing water courses overlapping. This may likely be a scale issue and/or difficulty in discerning flow in flooded area, but in general, need to ensure that details in design during the planning stages are consistent.
- Section 7.3.4 and touched on in 7.3.6 – The EA specifies that the size of the gravel used in the riffles of the designed channel should be determined using the shear stress of the hydrological modelling. Though I agree with this practical consideration, the design should also strongly consider the aquatic fauna likely to inhabit the new stream habitat (said in passing within 7.3.6). Many fishes require a specific type of gravel composition and the selection of gravel should consider the type of fish likely to inhabit the stream. Furthermore, the final design should avoid the use of relatively homogeneous gravel because most natural systems have a relatively heterogeneous gravel composition, which increases the potential habitat of macroinvertebrates and fish species capable of utilizing the habitat. Perhaps the gravel composition of relatively productive parts of the Mud Creek system can be used to provide a general idea of a biologically relevant gravel composition for the design stream sections. The EA could have better addressed these concerns in the section 7.3.6 given that information on fish and macroinvertebrates is available.

- The PCSWMM files for hydrological modelling were supposed to be in appendix K, but no such appendix was provided.
- Page 45: Wording is confusing. What is meant by "upstream of Wonderland Road"?
- Page 59, section 4.2.2.2. begins with “All three woodlands” – the use of the word ‘three’ is confusing.
- Unsure of the exact location of the first two photos in Appendix I. Need some clarification or could use a map to show locations of the photos.

Appendix B – Subject Lands Status Report and Environmental Impact Study

- Data for the stream fish assessment was used from previous studies on Mud Creek, but there are no details as to the methodology employed or the effort of the sampling. The consultants merely say they deem the data sufficient. This makes the stream fish assemblage section of the EIS difficult to evaluate and such a problem is evident in most EIS documents we see containing aquatic environments.
- Page 74 - Table 16 under Mitigation for Loss of Aquatic Habitat: I agree that the planned stream habitat improvements will provide enhanced water quality and habitat for stream fishes. However, the significant stream alterations that will occur between the Oxford Road and CN rail line will likely displace the fishes currently inhabiting the stream. Is there or will there be sufficient connectivity and fish upstream of the site to repopulate the altered stream sections? Furthermore, do the upstream sections of Mud Creek possess the diversity of fishes to maintain the biodiversity of the remediated stream section?
- Page 75 - Table 16 under Mitigation for Sedimentation: The listing of the warm water fish timing window is reversed (July 1 to March 31) making it appear as if the timing window is much larger. It dates should read: March 31 – July 1.
- Page 77 under Terrestrial Habitat and Communities Construction Mitigation: There are contradictory statement being made when the consultants say “Re-vegetate and restore disturbed areas with native vegetation immediately after construction or for periods of inactivity. Use of native, non-invasive species and complementary vegetation in all open spaces created”. They say that native species should be used when restoring disturbed areas, but then say non-natives can be used in open spaces created. This is a confusing switch because the restoration or modification of a natural area should not result in the introduction of a non-native species. Instead, it should be an opportunity to enhance native vegetation communities. I recommend the statement be altered to say that native species should be used in all replanting activities.
- For the adaptive monitoring plan, the consultants list several areas to monitor post construction. Though they acknowledge this is not an exhaustive list, I think an incredibly important aspect of the monitoring should be the recolonization and use of

remediated/modified stream reaches by fish and benthic macroinvertebrate communities. The aquatic environment will be the major disturbed area and should be intensively monitored. Aquatic communities are often forgotten about in environmental impact studies and, especially, during post-construction monitoring studies. Also, strong post-construction monitoring of the stream will help provide the City of London with information for any future stream restoration efforts.

- Survey for migratory birds in spring and fall appear not to be conducted. This should be included in the surveys for May and September.

Comments for benthic survey - Mud Creek EIS

Lauren Des Marteaux, August 2016

1. The EMG requires a 'benthic survey', timing recommendation for 'wetland species' is summer (mid-July/early August). Are benthic invertebrates are considered 'wetland species' in the EMG? If so, the EIS 'benthic invertebrate collection' was completed in the fall on October 17, rather than in summer. Note there can be different assemblages of invertebrates at different times of year

2. Were benthic survey stations chosen haphazardly?

3. Hilsenhoff recommends sampling at least 100 arthropods for the Biotic Index (likely to increase accuracy), but the calculation is a ratio and therefore having fewer than 100 arthropods does not make the index calculated for station 4 'invalid'.

4. The Biotic Index values in the 1987 Hilsenhoff article (below) do not match this EIS. According to the table, station 2 is 'very poor' (BI=9.88), stations 1 and 3 are 'poor', and station 4 is 'fairly poor'. I'm not sure that this would change the conclusions, but should still be reported accurately.

Table 1. Evaluation of water quality using biotic index values of samples collected in March, April, May, September, and early October.

Biotic Index	Water Quality	Degree of Organic Pollution
0.00–3.50	Excellent	No apparent organic pollution
3.51–4.50	Very Good	Possible slight organic pollution
4.51–5.50	Good	Some organic pollution
5.51–6.50	Fair	Fairly significant organic pollution
6.51–7.50	Fairly Poor	Significant organic pollution
7.51–8.50	Poor	Very significant organic pollution
8.51–10.00	Very Poor	Severe organic pollution