Review of the Parson's environmental impact studies for the Central Experimental Farm

By Nina Munteanu
March 15, 2022

Nina Munteanu is a limnologist with over 25 years' experience as a field scientist and environmental consultant.

MAY 2021 Environmental Impact Statement / OCT 2021 Environmental Effects Assessment

I would like to offer the following observations, comments, and opinions based on my experience as limnologist/ecologist and what I read in the two Parsons reports:

General Observations:

The May 2021 EIS report reads more like a short overview summary/inventory than an actual Environmental Impact Statement. My impression of the report is that it was rushed to meet a deadline. The introduction to the May 2021 EIS report reveals that the purpose of the document "is to outline the natural environment existing conditions in the project area, study area, and relevant features within the surrounding lands." While the project area is described, the description appears surficial and lacks context and connection to potential impacts. Ecological relevance is not clearly described. I found it rather surprising that a single site visit (April 14, 2020) was undertaken by one researcher (terrestrial biologist with a Master of Art degree) to "inspect the natural environment features including habitat suitable for Species at Risk and other wildlife habitat, and to characterize the existing conditions of the site"—the latter of which encompasses so much, including an entire lake ecosystem.

The EIS may appear complete (like a checklist) but it lacks coherence. Coherence brings relational aspects into consideration to provide meaning (to that checklist). Not providing an understanding of coherence is like having a recipe with an ingredient list but no instructions. The reader/stakeholder has little means to use the report to make their own judgments.

For instance, in Section 2.0 of the May 2021 EIS, which delineates provincial and municipal environmental policies, it is not made clear which policies are relevant to the study site and how. The report simply lists these without context, which is obtuse and not useful for interested parties and stakeholders.

I found no figure that showed significant wetlands in Ecoregions 5E, 6E and 7E. Do these fall within the study area? Why mention these if they are not relevant?

What is the topography of the site? I saw no topographical map and did not find any discussion on slope considerations. While information on soils and geology was provided in Section 4.2, their EI role in conjunction with slope was not discussed. I saw no mention and consideration of EI risk for slope destabilization, erosion, loss of functional coherence in soils (including mycorrhizal community).

In Section 3.0 (Methodology) of the May 2021 EIS, specific names of contact persons in the various government agencies are not provided; context of contact is also not provided. These should all be in an appendix for reader transparency. The appendix does include a few example emails but is not comprehensive and does not match the general list provided in this section.

Section 4.0 of the May 2021 EIS is extremely brief, overly general and at times vague—particularly to do with EI relevance. The descriptions again read like the ingredient list of a recipe without the instructions. Where is the connection to susceptibility, ecological niche, adaptability and resilience, succession, overall system function, connectivity, risk? This is an Environmental Impact Statement, not an inventory. Where is the meaning?

The October 2021 EEA focuses on impacts of the Phase 2 project area and does not appear to provide a comprehensive impact assessment for the entire project area (all phases) and affected adjacent areas. Table 15 in the October 2021 EEA identifies several potential impacts posed by: release of polluting substances to land, water or air; clearing of vegetation, deforestation, alteration of water quality/flow in a water body and groundwater resources. The EEA report suggests that these can be managed through mitigation measures (Table 20). Mitigation measures appear to mainly address construction phase, not the ongoing effects of permanent removal and alterations of ecosystems, and installation of structures associated with the project. Planting trees and vegetation is not the same as establishing a functioning ecosystem. Compensation (planting elsewhere as per DFO mandate) does not address the impact onsite.

The October 2021 EEA acknowledges potential impact from construction activities to the nearby waterbody (Dows Lake and associated wetlands). This includes “use of concrete, lime or mortar” during construction. They also acknowledge that “disturbed or stockpiled materials that may be eroded during rainfall events may flow into storm sewers and into watercourses, delivering sediment [and other deleterious materials] into the aquatic environment.” These statements in Table 20 acknowledge the connectivity of ecosystems (terrestrial and aquatic); yet in Table 13, the report suggests no connectivity: “no wetland features are located within or in proximity to the Phase 2 project area…the nearest surface water feature, Dow’s Lake, is located over 50m [in fact it is less than 70m] from the project limits, and is separated by high volume roadways, pedestrian pathways/boardwalk, and highly manicured landscaping.” These seem contradictory to me. Either potential impact through connectivity is recognized or it isn’t. Which is it?

Ultimately, I am not convinced that the ecosystem value of the study area was sufficiently characterized by the Parsons EIS and EEA. My opinion is that they were hastily put together, appear to internally contradict, and lack key detail and context for reader/stakeholder understanding. The EIS and EEA read more like checklists with a goal to meet regulatory criteria than actual environmental effects investigations. Biological components and pathways appear over-simplified, without functional context, and possibly agenda-driven.

General Description of the Natural Environment:

1. The general description in the May 2021 EIS is overly brief and without significant discussion. The "naturalized landscape feature"—simply described as a "narrow remnant woodlot" (Carling Avenue Woodlot)—is insufficiently described. It is only mentioned. Is this the 23% of the 20 hectare area of wooded terrain mentioned? What is its ecosystem service? Is it a complex or simple ecosystem and in what stage of succession and ecosystem service?
2. In the report introduction and in an email to Parks Canada, Parsons terrestrial biologist Nicole Nolan, BA. described the environmental study area as consisting of a "120 m buffer on the anticipated impact area in order to capture surrounding terrestrial habitat features that may be impacted by the proposed project and implementation." What does this actually mean? It is vague on all counts (spatially, temporally, existentially, and meaningfully). How will this "buffer" area serve to "capture surrounding terrestrial habitat features" of the project? What, for instance, is a habitat feature? How does one describe the dynamic role and interplay of a functioning ecosystem and various habitats within it? Upon what sound scientific criterion was this 120 m distance from the project based? Both terrestrial and aquatic based ecological connectivity can easily extend farther than 120 m, based on topography, landscape, wildlife movement and other modes of communication and transport, domain, weather, precipitation, and other environmental factors. Based on the map of the project, the northwest corner (where a substantial tree removal is proposed) is less than 70 m from Dow's Lake, with obvious influence on that aquatic ecosystem. To compartmentalize representability through an arbitrary distance seems overly naïve and limiting.
3. I get no sense of how each component described is related to others through ecosystem function and structure. What, for instance, are the facilitation cascades? Are there any risks of trophic cascades? What are the keystone species and how do they function in the spatial and temporal scale relationships of the study area and adjacent region? What are the wildlife corridors and how would they be affected by the project? What about the ecotones and the role they play in biodiversity and resilience (e.g. forest edges, wetlands)?
4. Section 2.3.7.3 (tree conservation and replacement) of the EEA report acknowledges the value of tree canopy cover in providing ecosystem services such as "habitat for wildlife, contributing air-quality, rainwater infiltration, noise-buffering, and mitigation of heat-

island effect in an urban setting, as well as providing accessible urban greenspace for the public." The EEA then provides the goal of planting "one tree for every five parking spaces," as though applying a simple formula. I find this engineer's approach to a complex ecological phenomenon limited and misguided. The report seems to confuse 'trees' for 'habitat'. Trees are NOT a forest. Trees only provide major ecosystem services through community and 'habitat' as a forest. "Forests aren't simply collections of trees," argues Suzanne Simard, forest ecologist at the University of British Columbia. Intact functioning forests include so much more than trees, such as mosses, fungi, soil and litter, decaying organic matter, undergrowth, insects and other life that together contribute and maintain a functional ecosystem. The complex processes and interactions of this community reach way beyond the forest. These include water and nutrient cycles, and climate.

5. What major ecosystem services does this area currently provide? How does the study area locally address climate change such as carbon sequestration? Intact functioning forests and wetlands provide significant carbon sinks and actively remove carbon from the atmosphere. The key to successful carbon sequestration is that they operate as functional ecosystems (not just a big tree here or there without its supporting community or a fragmented wetland without its contiguous land and littoral zone of lake). The EIS and the EEA make no mention of this important consideration.

Landforms, Soils and Geology:

Section 4.2 of the EIS is overly superficial and provides no context for the brief description. How do these environmental conditions relate to a potential impact through disturbance of soils and other related activities? What risk factors are associated with these conditions? The report mentions that some (how much?) of the area was "historically disturbed by development including commercial, transportation, recreational trails and manicured parkland." What is their environmental significance to any potential impact of this proposed project?

Surface Water, Groundwater, and Fish Habitat:

Section 4.3 of the EIS is brief and lacks details and context for potential groundwater and surface water impact posed by the project. Sections 2.3.1 (Wetlands) and 2.3.4 (Aquatic Environment) of the EEA focus on direct impacts of the Phase 2 project area (only a portion of the larger project) and dismiss these environments as being outside the NCD site and state categorically that these "will not be impacted by the proposed work." Yet, elsewhere they acknowledge connectivity with storm sewers and mitigation procedures aimed at reducing erosion of disturbed soils, etc. I find this contradictory.

1. **Groundwater:** The EIS report acknowledges that "indicators of groundwater discharge (e.g., springs/seeps, watercress, iron staining, significant temperature change, rainbow mineral film) were not observed within the study area." But they do not provide observations or measurements of groundwater movement. However, from the October

2021 EEA, I understand that Golder installed six groundwater monitoring wells which yielded some issues with contamination (e.g. PAHs, vanadium, conductivity, sodium and chloride and chloroform) apparently from former use as landfill and demolition debris from the previous presence of buildings, and road salt use in the parking area.

2. **Surface Water:** The EIS acknowledges the two principle surface water bodies in/near the study area as Dow's Lake and the Rideau Canal. However, Dow's Lake is not characterized. There is only a vague description focused on fish species; nothing else is given about the lake, its connectivity with the study area (which lies completely within its watershed and with the project's northeast corner located less than 70 m from the lakeshore). Is this lake already stressed by current infrastructure? How is storm water runoff currently addressed? What is the current water quality of the lake? Is the lake eutrophic? What about its biota: algae, benthos, amphibians, reptiles—not just fish? (Benthic invertebrates—the food for many fish—can be far more susceptible to inorganic and organic pollution and toxins in non-point sources of terrestrial disturbance). All this information is necessary to make the following assessment: how much more pollution/disturbance will tip the lake into a state that is detrimental to a healthy and functioning lake ecosystem where fish can thrive?
3. **Surface Water:** The report does not mention or discuss other urban surface water phenomena that may be affected by the project through disturbance of soils, potential erosion, removal of buffer forest and associated vegetation, and placement of large areas of impervious surfaces that will increase urban runoff and storm water discharge with additional impact to the lake. The EIS does not provide sufficient baseline information on these current phenomena in the study area. Instead, the report moves on quickly to describe fish species in Dow's Lake based on a 2017 study (not current to the 2021 reports). The EIS and EEA reports acknowledge some species at risk (e.g. American eel) and potential species of conservation concern. Again, no mention of risk posed by the project connects to this biota and waterbody. The EEA, while on the one hand dismisses the wetlands and the lake as outside the influence of the project, on the other provide mitigation actions to do with construction (aimed at several key species). Page 22 of the EEA also acknowledges the presence of stormwater sewers that flow into Dow's Lake.
    a. **Urban runoff and storm water management**: Urban runoff is any kind of surface runoff of rainwater created by urbanization such as impervious surfaces: rooftops, streets, sidewalks, parking lots and driveways. Mostly in the form of contaminated storm water runoff, it is a major source of urban flooding and water pollution in urban communities worldwide; urban runoff is also recognized by governments as the leading source of water quality problems in urban settings. Runoff from impervious surfaces picks up gasoline, motor oil, heavy metals, trash, salt and other pollutants from roadways and parking lots. Polycyclic aromatic hydrocarbons (PAHs), are combustion byproducts of gasoline and other fossils fuels. Heavy metals such as nickel, copper, zinc (from galvanized gutters), cadmium, and lead are often part of urban runoff. I saw little consideration in both reports of this non-point source of pollution to aquatic

habitats potentially posed by vegetation removal, deforestation, winter salting, and increased impervious surfaces of the project.

4. **Wetlands:** The nearby wetlands, associated with Dow's Lake, are not clearly characterized based on their ecosystem role and their connectivity with ground water below the project site and their coherence with the natural park upslope (e.g. birds, wildlife, insects). The October EEA argues that "no wetland features are located within or in proximity to the Phase 2 projected area…the nearest surface water feature, Dow's Lake, is located over 50 m from the project limits." The distance is less than 70 m, which is close (in fact, page 39 of the EEA report acknowledges that the distance of Dow's Lake is 50 m east of the project). The report also acknowledges that high volume roadways, boardwalk and manicured landscaping already provide impact. Surely this is argument for a precautionary approach to the risk of additional impact posed by the project, resulting in cumulative effects with potential exceedances of threshold levels for deleterious substances.

General Mitigation:

While mitigation measures appear comprehensive in the EEA, virtually all address disturbances to do with construction and on-site activities (e.g. siltation, erosion etc.). There appears no mention of mitigation measures to address permanent removal of a functional ecosystem and placement of extensive impervious surfaces. How will removal of that situational ecosystem-service be mitigated or compensated? How will *ongoing* effects of the project itself impact both terrestrial and aquatic ecosystems and communities that use them? There is no risk assessment that incorporates overall ecosystem service to make this clear—and therefore no mitigation list associated with it.

It seems odd that one of the mitigating measures suggests that "vegetation that is removed should be replaced with an appropriate native mix of vegetation endemic to the area and compatible with the existing land features." This is odd, given that mitigation is not provided for removal of large sections of forest ecosystem including the removal of 1232 trees (and associated ecosystems) and replacement with concrete or other impervious surface.

Both reports fail to consider and discuss the ecosystem role that these to-be-removed tree stands with associated understory and natural (ungroomed) vegetation and undisturbed soils (with associated communities) play in land stabilization, erosion protection, flood control, water quality, and air quality—not to mention wildlife habitat, general aesthetics for Ottawa citizens and overall connectivity. No organism or system operates in isolation. Ecology recognizes the interconnectivity of all things. What, for instance, is the cost to the city's green infrastructure and connectivity incurred through permanent removal of this large green space with significant natural woodlot? What is the larger scope of impact posed by this development project? On the remaining natural area by the lake? On the city's nearby community? On the city itself? In 2013, the Economist Intelligence Unit (sponsored by Siemens) ranked Canadian cities in a Green City Index based on 9 evaluation criteria (CO_2, land use, energy, buildings, air,

transport, water, waste, and environmental governance). Ottawa ranked a green score of #12 due to its land use, good public transit system and low CO2 emissions. The capital however lags way behind Vancouver (at #2); Ottawa does not have enough LEED certified buildings and needs to improve its environmental governance (green action plans and management, funding, etc.). Considering its stature as Canada's capital city, I would think that the city should be striving to lead the country in green infrastructure and climate change response, not follow...

My Take Home:

It seems to me that this rather unique natural landscape in the heart of urban Ottawa should be preserved for ALL to enjoy and may provide a far more valuable service for the city as a park through an essential ecosystem service of biodiversity, coherence, natural buffer, etc.
I say this because it is my understanding that another site located near transit, which is NOT adjacent to the lake, NOT located on a slope with a substantial natural woodlot and established parkland, is available for the project. Given that the adjacent land use of the project site is largely medium and high density residential, commercial, and institutional land uses, the currently existing land use of open space/park with wooded areas (or something like it) provides some necessary green infrastructure to the area. What appears more sound to me is that the natural wooded ridgeline and associated park be managed, not removed. Given the abundance of invasive plant species (e.g. common buckthorn, dog-strangling vine), a sound vegetation management plan with additional planting could improve the ecosystem service provided by this unique parkland and aquatic buffer.

My ultimate question is: Did the May 2021 EIS and the October 2021 EEA provide a sufficiently detailed risk assessment based on ecological coherence and overall service? Did the reports use the precautionary principle with sound scientific assessment?

Risk Assessment / Precautionary Principle:

The scientific method relies on accurately measuring certainty and therefore reliably predicting risk. This means accounting for all biases and errors within an experiment or exploration. In my work as a field scientist and environmental consultant representing a client, we often based our formal hypotheses in statistics, which considered two types of error: Type I and Type II errors. Type I errors are false positives: a researcher states that a specific relationship exists when in fact it does not. This is akin to an alarm sounding when there's no fire. Type II errors are false negatives: the researcher states that no relationship occurs when in fact it does. This is akin to no alarm sounding during a fire.

Environmental scientists generally pride themselves on the use of the Precautionary Principle when dealing with issues of sustainability and environmental management. According to the Precautionary Principle, "one shall take action to avoid potentially damaging impacts on nature even when there is no scientific evidence to prove a causal link between activities and effects."

The environment should be protected against substances which can be assumed potentially harmful to the current ecosystem, even when full scientific certainty is lacking.

Projects that focus on monetary cost often focus on avoiding Type I rather than Type II statistical errors. In fact, by avoiding Type I errors, scientists increase the risk of committing Type II errors, which increases the risk that an effect will not be observed, in turn increasing risk to environment.

Relevant to Dows Lake:

In describing the case of the eutrophication of Skagerrak, a marine inlet, **Lene Buhl-Mortensen** asks: which is worse? Risk a Type II error and destroy the soft bottom habitat of Skagerrak and perhaps some benthic species, or risk a Type I error and spend money on cleaning the outfalls to Skagerrak when in fact there is no eutrophication? "Scientists have argued that cleaning up is too expensive and should not be done in vain," writes Buhl-Mortensen. "But more often the opposite is the case. The increased eutrophication of Skagerrak could end up more costly than reducing the outfalls of nutrients [to the inlet]."

"Because threats to the environment are threats to human welfare, ecologists have a *prima facie* ethical obligation to minimize Type II errors," argues Buhl-Mortensen in the journal **Marine Pollution Bulletin**. Use of the precautionary principle will save costs—and lives—in the end.

Nina Munteanu, M.Sc., R.P.Bio. (Limnology / Ecology)
Instructor at the University of Toronto
Author of "Water Is…The Meaning of Water" (Pixl Press, 2016)
'When Cutting Trees Hurts People' (March 31, 2022)
https://themeaningofwater.com/2022/03/31/when-cutting-trees-hurts-people/