

Modelling of Surface Water Features and Evaluation of Wetland Restoration Potential at a Watershed Level

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In order to support wetland replacement requirements under the Wetland Mitigation Hierarchy (Alberta Wetland Policy 2013), a database of degraded wetland habitat available for restoration or enhancement is essential. MEL has completed watershed modelling in Nova Scotia using digital elevation model (DEM) and LIDAR, forest and soil inventory maps, wet areas mapping and other available databases allow for generation of a modelled surface water layer (wetland habitat and watercourse systems not currently mapped or visible from aerial photography). Planners, industry practitioners, municipalities and developers use this modelled layer to focus field efforts and support development and begin to understand surface water systems across a watershed or parcel of land.

Evaluating the intersections of anthropogenic activities (oil and gas, urban development, forestry, roads) with the modelled watershed layer identifies degraded wetland systems and specific wetland restoration opportunities. The results of this watershed modelling provide a database of restoration sites to support wetland replacement requirements under the Policy. A quantitative analysis is completed in order to determine the significance of the wetland restoration potential for each identified opportunity. The quantitative analysis has been adapted from data provided in *Wetlands Restoration Strategy: A Framework for Prioritizing Efforts in Minnesota, Minnesota Board of Water and Soil Resources, December 2008*. Quantitative parameters include: surface area/size; position in tertiary basin (headwater) and association with a 1st or 2nd order stream; significance of observed wetland degradation; significance of anthropogenic efforts to remove water from the landscape (i.e. presence of surface drains or water impoundment areas); restorative potential for a particular species at risk; watershed/wetland ratio; % wetland cover in watershed; proximity to other wetlands; and, proximity to watercourses.

Results identify a modelled surface water layer to support planning and development, and identify and rank degraded wetland habitat that could be restored to substantiate replacement requirements in the Alberta Wetland Policy. Within Nova Scotia, over 800 hectares of degraded wetland habitat with restoration potential was identified in 2014 to support the Nova Scotia Wetland Conservation Policy.

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Ms. Milloy is the Vice President of McCallum Environmental Ltd. (MEL). She executes federal and provincial environmental assessments for large scale development projects in the energy sector (wind, natural gas pipeline, oil and gas), transportation sector (roads and highway developments), mining, and the development sector (commercial projects). Ms. Milloy manages these projects and is responsible for all aspects of the project deliverable (budget, timeline, client relations, regulatory negotiations). Ms. Milloy is a wetland and watershed specialist and completes wetland delineation, functions assessment, species at risk evaluations, regulatory permitting, and wetland restoration and creation projects. Ms. Milloy can provide clients with options for naturalized stormwater management for development projects. Ms. Milloy also regularly completes federal environmental screening requirements for the Navigable Waters Protection Act, DFO serious harm to fish projects and watercourse alteration permitting.