

Ecologic Function

Coarse Scale Habitat – Wetland Patch Size Target –Ecologic Function

The purpose of setting a target related to this value is to ensure that the preferred scenario includes a well distributed network of large wetlands that provide a diversity of habitats for a broad range of species including sensitive species.

A high proportion of Ontario's fish and wildlife species inhabit wetlands during part of their life cycle including many that are deemed at risk.

Wetlands are important on the landscape as they impound water and help to mitigate peak flows and run off protecting downstream areas from erosion and flooding. In addition, wetlands help to augment low-flow conditions by releasing water over an extended period of time and raising the water table to increase base flow to streams. Wetlands have the ability to perform a significant role in improving water quality by filtering sediments and contaminants and limiting the impacts of thermal pollution to the receiving water body (Environment Canada, *How Much habitat is Enough*, 2006).

While the adage "bigger is better" certainly applies to wetlands, size is not the only factor to consider. The type of wetland (bog, fen, marsh or swamp) is also important as well as the hydroperiod (the length of time a wetland is inundated with water).

Datasets

1. NPCA NAI ELC Community Series Mapping
2. Soil Landscapes of Canada

Wetland cover is determined by combining all of the mature wetland community types from the ELC mapping. This means that Swamps, Marshes, and Bog dominant communities are considered part of the broader and more general concept of 'wetland cover' as it pertains to habitat. It should be noted that there are many sub dominant wetland communities complexed into the watershed's ELC mapping units.

Wetland patches were derived by dissolving the wetland ELC communities isolated as wetland cover habitat into individual mapping units. A derivative patch is a polygon of wetland cover that does not share a border with another patch, there needs to be a separation by non natural cover in between.

Across the study area there are a total of 12776 patches generally averaging 2.3 hectares in size (std. dev 18.2ha) with the largest being 1609 hectares.

The patches were classified by size using ranges suggested in *How Much Habitat is Enough* which are based on response by forest birds. Statistics were generated for each class to help inform target development for this ecological objective.

Discussion

The discussion concerning this target focused on the concept that in terms of habitat value, bigger is better.

Given that all Provincially Significant Wetlands will be included as a constraint to the modeling exercise, some in the group felt that setting a target around patch size was redundant. It was accepted that by including this target we could compare wetland patches to each other.

There was also much discussion about how to break up the patches according to size and the group felt that given the fragmented nature of our watershed, it was okay to be arbitrary in the size classes, and settled with the following classes:

Marshes 10 to 50ha
Swamps 10 to 50ha
Any wetland greater than 50 ha

Data Gap

None noted.

Decision

Date: May 5, 2011

100% of wetland patches greater than 50 hectares by soil landscape.
50% of swamps greater than 10 hectares and less than 50 hectares by soil landscape.
100% of marshes greater than 10 hectares and less than 50 hectares by soil landscape.

Representation in the Learning Scenarios

A large percentage of the natural cover that was Included in the learning scenarios was wetland cover. It contributes roughly 40.79% of all natural cover.

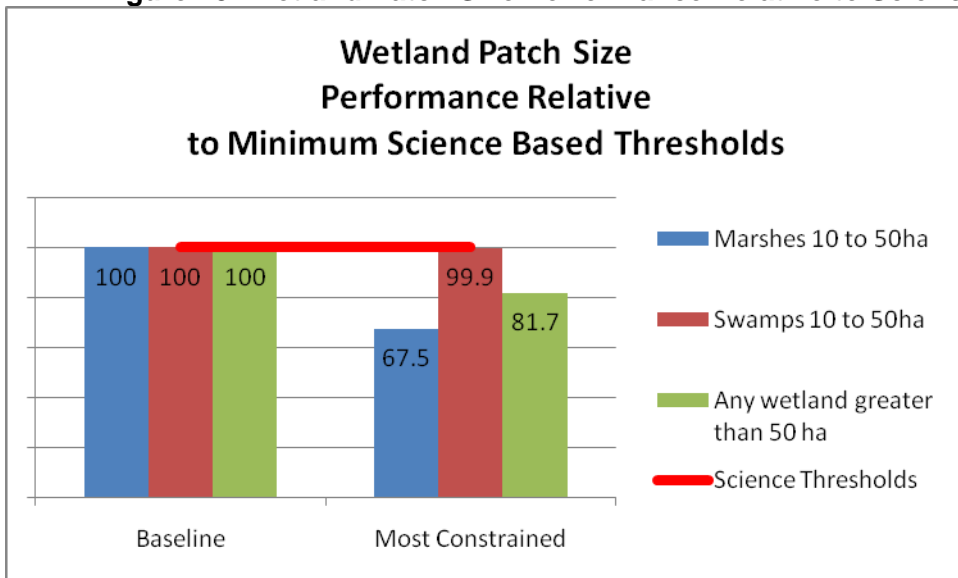
In many cases, the same features contributed to multiple targets. In the case of wetland patch sizes, targets were set on three categories of size in an effort to establish differences in the habitat value associated with the sizes. A distinction was also made between the marshes and the swamps as they provide very different habitat for different suites of species. It was also acknowledged through the targets that wetlands greater than 50 hectares in size regardless of what type of wetland were important to include in all scenarios.

Representation in the Final Scenarios

Under the Baseline Scenario, wetland cover was a driving factor for the spatial configuration. This was based once again on the fact that most wetlands in the Niagara Watershed are provincially significant and as a result they were included as a constraint. Patch sizes are obviously interlinked with the general targets set for wetland cover.

Under the Baseline Scenario, all Wetland Patch Sizes achieved 100% of the value in the targets within 100% of the area in the inventory. This is largely due to the fact that the targets did not ask for anything more than what is currently available on the landscape. Also, most wetlands are swamps which also contribute to overall forest cover and as a result make efficient forest cover contributions.

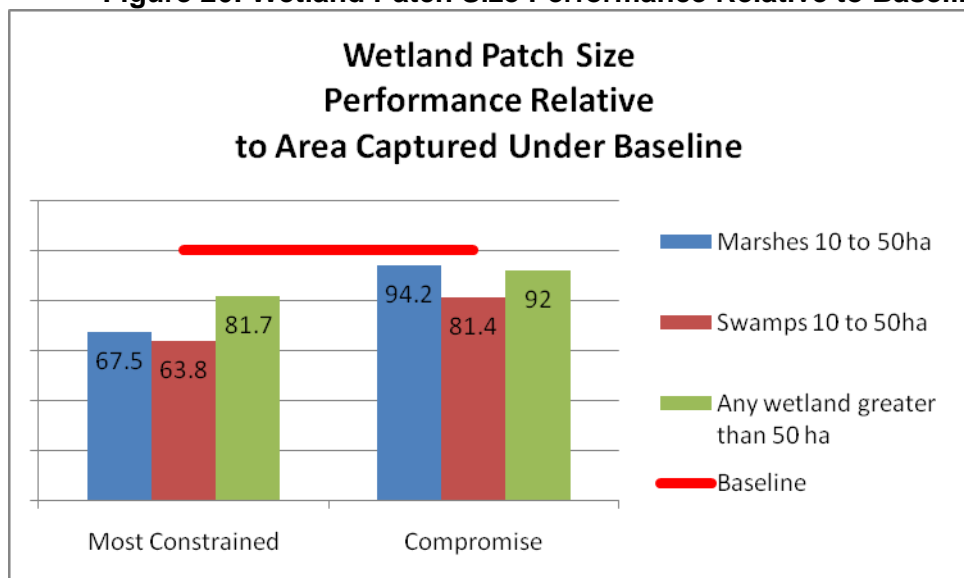
Figure 25: Wetland Patch Size Performance Relative to Science Thresholds



Under the Most Constrained Scenario, Wetland Patch Size contributions were limited to those areas that were included due to the Provincially Significant Wetland designation and the fact that they were not found on agricultural capable soils or in urban areas. Under this scenario, the inclusions were the driving factor to the spatial configuration not the fragmented natural cover.

Wetland Patch Size over 50 hectares under the Most Constrained Scenario achieved 81.7% of the target value and 81.7% of the value held in the Baseline Scenario. This is because when the target is set to 100% of what currently exists, the achievement of the baseline will always equal your target value. Similarly, Wetland Patch Size Marshes 10 – 50 hectares in size under the Most Constrained Scenario achieved 67.5% of the target value and 67.5% of the value held in the Baseline. Wetland Patch Size Swamps 10 – 50 hectares in size under the Most Constrained Scenario achieved 99.9% of the target value and 63.8% of the value held in the Baseline.

Figure 26: Wetland Patch Size Performance Relative to Baseline Comparator



Within the Compromise Scenario, Wetland Patch Size overachieved the 80% target in some areas due to the fact that the larger patches were an efficient choice for overall wetland cover.

Wetland Patch Size over 50 hectares under the Compromise Scenario achieved between 92.0% of the value held in the Baseline Scenario. Wetland Patch Size Marshes 10 – 50 hectares in size under the Compromise Scenario achieved 94.2% of the Baseline value. Wetland Patch Size Swamps 10 – 50 hectares in size under the Compromise Scenario achieved 81.4% of the Baseline value.

Recommendations

Future analyses should consider determining more specific requirements for the size and distribution of marsh patches considering their poor level of representation in Niagara.

Consider breaking up soil landscape 569001 into zones east and west of the Welland Canal.