Hydrologic Function

Surface Water – Wetland Cover
Target –Hydrologic Function

This value is related to the amount of well distributed wetland cover in the study area.

The purpose of setting a target on this value is to ensure that the preferred scenario includes a minimum amount of wetland cover by at varying scales and well distributed, (by NPCA jurisdiction, WSPA, and by subwatersheds) to mitigate peak flows and run-off, and maintain good water quality and quantity.

While wetlands can provide substantial benefits anywhere they occur in the system, key wetland functions linked to groundwater recharge and discharge, protection against thermal pollution, and flood mitigation for example, have the greatest impact when they occur in the headwaters.

According to "*How Much Habitat is* Enough", Environment Canada, 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.

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.

There are four types of wetlands in southern Ontario. Bogs, fens, marshes and swamps. Bogs and fens are highly specialized environments. Both are characterized by their peat substrate and are therefore, very rare in the watershed existing in only a couple of locations.

Datasets

1. NPCA NAI ELC Community Series Mapping
2. NPCA Watershed Planning Areas
3. NPCA Subwatersheds

The Niagara Watershed currently has 12.4% of its land base in wetland cover which constitutes 40.79% of all existing natural cover (totaling 30% across the land base). The most dominant type at 10.14% of the landscape are swamp communities which is 82% of all wetlands types and 33.4% of all cover types. The rest at 2% are marsh communities and account for16% of all wetlands or 6.5% of all cover types. Bogs make up the difference; there are no fen communities in Niagara.

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 hydrologic function. It should be noted that there are many sub dominant wetland communities complexed into the watershed's ELC mapping units.

Discussion
The discussion around this target focused on the scale at which to represent the targets.

There was also much discussion about what constitutes an unevaluated wetland and how they are protected in the legislation.

There was a great deal of concern expressed by the agricultural sector about how the targets would impact their practices.

Data Gap
There is a lack of data on the location of storm water facilities and their contribution to the overall hydrologic function within the watershed.

Decision
Date: April 7, 2011

At least 10% in wetland cover by Watershed Planning Area and where we are currently below that target, the target is set at 100% of existing wetland cover.

At least 6% in wetland cover by subwatershed and where we are currently below that target, the target is set at 100% of existing wetland cover.

Representation in the Learning Scenarios
There is a very high percentage of wetlands on the landscape within the study area. This is largely due to the heavy clay soils in the area above the Niagara Escarpment and their ability to hold water. Through the Natural Areas Inventory, it has been documented that wetlands account for 40.79% of all natural cover in the watershed.

Wetland Cover was one area where there was very little in the way of flexibility given to the model to choose what would be considered for contribution to the scenarios. The Provincially Significant Wetlands were included 100% based on the socio-political constraints set for most of the scenarios with the exception of the Best of the Best Half Scenario.

Where the model was allowed to choose, there was still little flexibility given the exclusions placed on agriculture, aggregates and urban areas. The model was forced to choose essentially everything that was outside of these exclusion areas and therefore, the wetlands were all considered for their contribution. They often contributed to other targets particularly in the distributed Watershed Planning Areas where natural cover was well below the targets.

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 shortfall of the existing natural cover relative to the scientific target and the fact that Provincially Significant Wetlands were set as included.

Under the Baseline Scenario, Wetland Cover achieved 83.5% of the target value at the Watershed Planning level (10% cover) and 86.9% at the subwatershed level (6%) cover.

Figure 41: Wetland Cover Surface Water Performance Relative to Science Thresholds
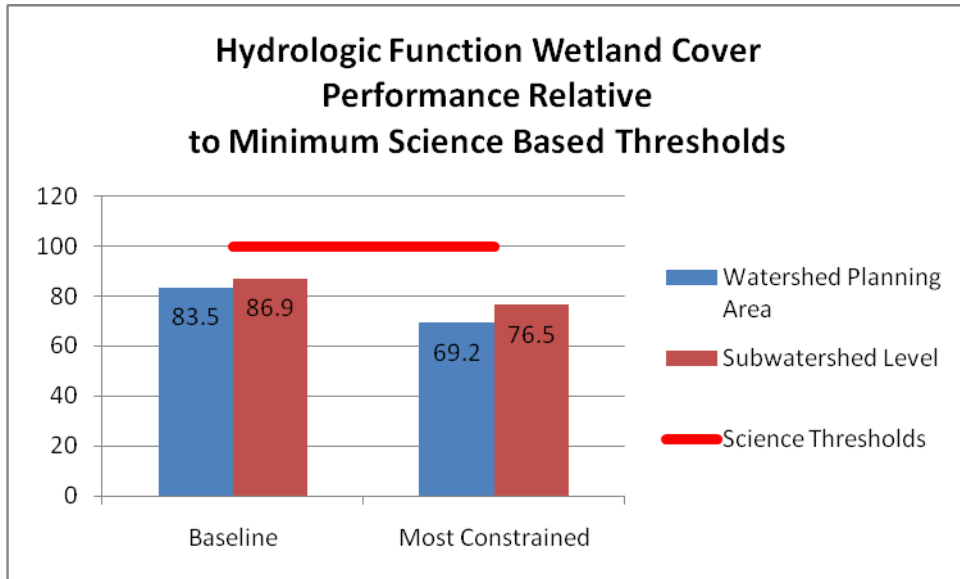
Under the Most Constrained Scenario, wetland cover was limited to those areas that were not found on agricultural capable soils or in urban areas except where they were locked in due to their status as Provincially Significant. Under this scenario, the inclusions were the driving force.

Wetland Cover under the Most Constrained Scenario achieved 69.2% of the target value and 60.6% of the value held in the Baseline Scenario at the Watershed Planning level. At the subwatershed level it achieved 76.5% of the cumulative target value which was equal to 60.6% of the value based on area held by the Baseline Comparator.

Figure 42: Wetland Cover Surface Water Performance Relative to Baseline Comparator
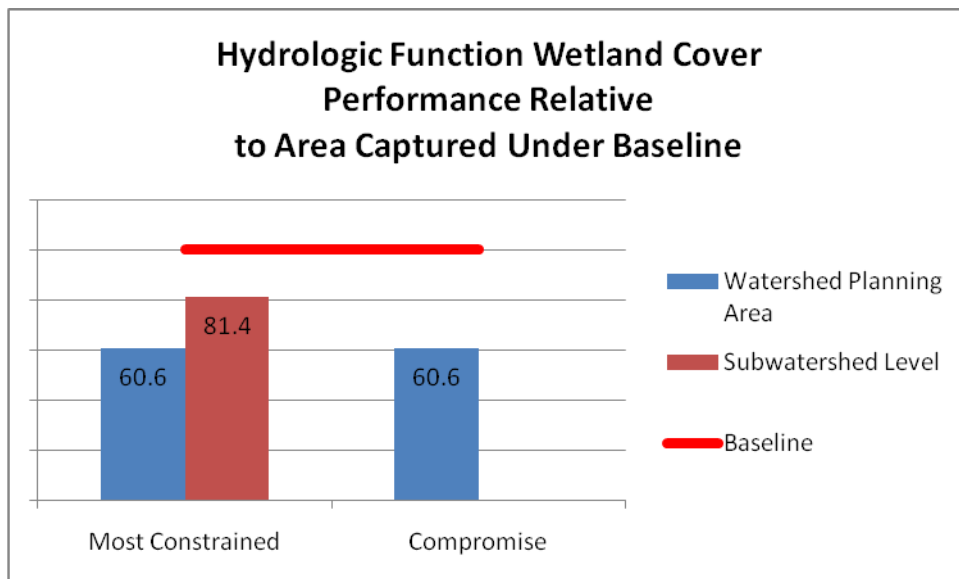
Within the Compromise Scenario, wetland cover was a determining factor in the spatial configuration even though under this scenario, the model was seeking only 80% of what exists

on the landscape.

Since this scenario was set up without geographic distribution of targets, comparatively Wetland Cover as it relates to the Hydrological Function targets in the Compromise Scenario achieved 81.4% of the cumulative value of the Watershed Planning level in the Baseline.

Recommendations

Update mapping with data on the location of storm water facilities and their contribution to the overall hydrologic function within the watershed.

Due to Niagara's unique geographic and soil conditions, wetland composition overall in the natural cover may have been much higher on landscape than what current science recommends as a guideline. An examination of pre-settlement conditions should be performed to glean what the traditional Upland and Lowland balance for Niagara might have been.

Work to remove manmade drainage from the dataset where appropriate.