

Ecologic Function

Coarse Scale Habitat – Forest 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 forest patches to provide habitat for a broad range of species including those that require forest interior habitat.

The literature related to forest patch size indicates that larger patches of forest contain more and varied habitat niches to therefore support a greater diversity of species. In addition, there are generally less edge effects associated with larger patches and more forest interior for a specialist suite of species.

Datasets

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

Forest cover is determined by combining all of the mature wooded area community types from the ELC mapping. This means that most mature tree dominated communities like Woodlands, Savannahs and Plantations are included with the ELC 'Forest' community and considered part of the broader and more general concept of 'forest cover' as it pertains to habitat.

Forest patches were derived by dissolving the mature wooded ELC communities isolated as forest cover habitat into individual mapping units. A derivative patch is a polygon of forest 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 15647 patches generally averaging 2.9 hectares in size (std. dev 18.2ha) with the largest being 1485 hectares.

The patches were classified by size using the 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.

Patch Size Class	Number of Patches	Percent of Forest Cover	Percent Land base
Up to 20 ha*	15133	40.3	7.4
20 – 50 hectares	359	25.1	4.6
50 – 75 hectares	68	9.1	1.7
75 – 100 hectares	37	7.2	1.3
100 - 200 hectares	40	11.4	2.1
Greater than 200 hectares	10	11.1	2

*No specific targets were set to include patches under 20 ha.

Table 8: Forest Patch Size Statistics

Discussion

The discussion for this value focused on the concept of when it comes to coarse scale habitat value, bigger is better. The research suggests that the ecological function and wildlife habitat

benefits are greater when habitat is distributed in larger contiguous patches rather than evenly distributed fragments. The Scenario Development Team (SDT) did agree that the remaining forest cover throughout the watershed is severely fragmented.

There was a distinction made between the top three classes as they relate to size of patches and smaller patches. The agricultural community wanted to be clear about the fact that these targets in no way prevent the harvesting of timber from the forests.

Data Gap

None noted.

Decision

Date: April 7, 2011

100% of top three size classes by soil landscape.

75 – 100 hectares
100 - 200 hectares
Greater than 200 hectares

50% of the next two size classes by soil landscape.

20 – 50 hectares
50 – 75 hectares

Representation in the Learning Scenarios

Most of the natural cover in the study area is forest cover. It contributes roughly two thirds of all natural cover.

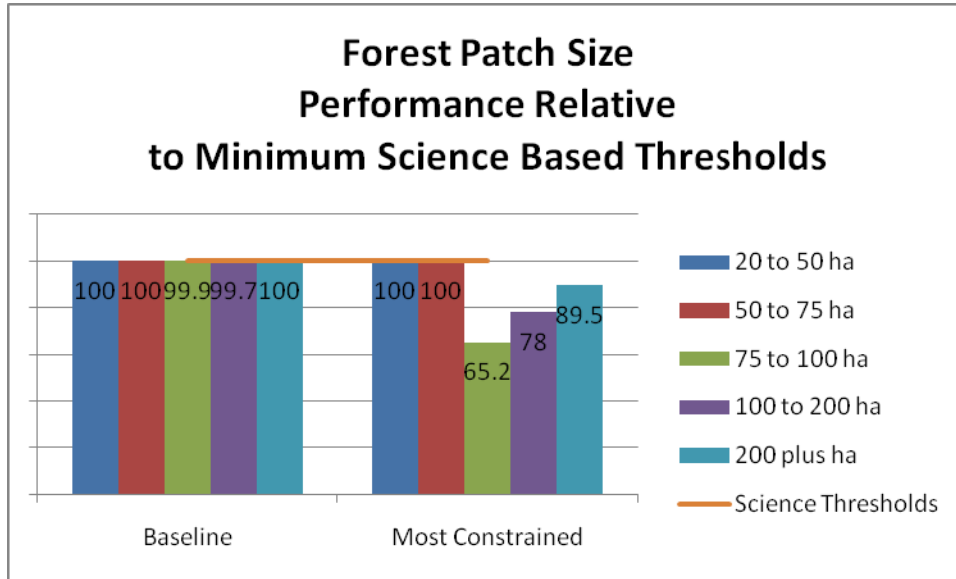
Given the condition of the landscape at 18% forest cover, and the scientific target being much higher at 30%, the spatial component of all scenarios was driven largely by forest cover.

In many cases, the same features contributed to multiple targets. In the case of forest patch sizes, targets were set on several categories of size in an effort to establish differences in the habitat value associated with the sizes with an emphasis on separating out the top three largest patch size classes (everything over 75 hectares in size). In most learning scenarios investigating certain percentage of what currently exists, the larger forest patches were continually selected as the most efficient way to achieve the overall forest cover goals.

Representation in the Final Scenarios

Under the Baseline Scenario, forest 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. Patch sizes were obviously interlinked with the forest cover.

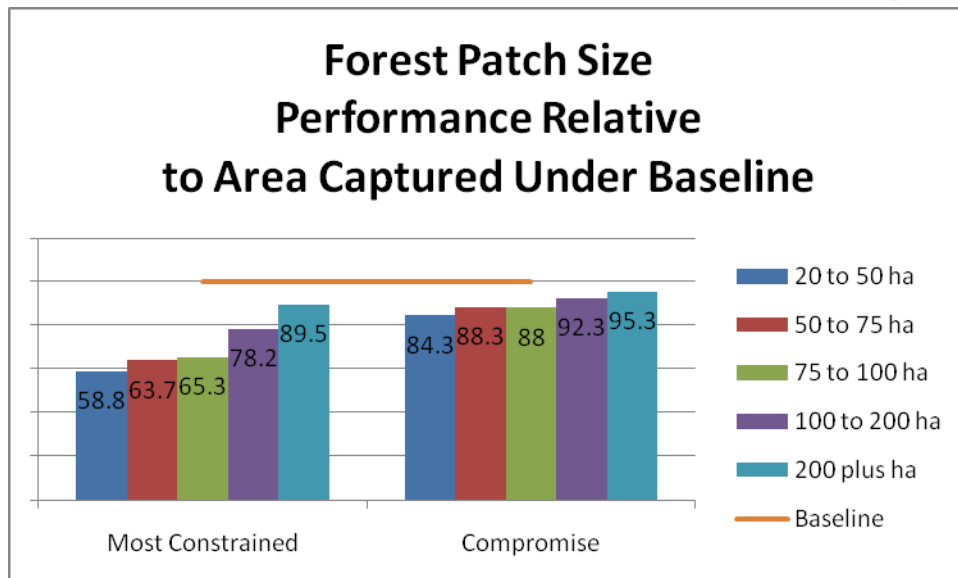
Figure 17: Forest Patch Size Performance Relative to Science Thresholds



Under the Baseline Scenario, almost all of the size classes available in the inventory were captured. Because the targets were set to include all over 75 ha and half of the area of those between 20 and 75 ha the targets were easily met. This again is due to the dependent relationship with overall forest cover which is below its objective. As a result it becomes efficient to include all of the forest patches regardless of size towards the overall forest cover target.

Under the Most Constrained Scenario, Forest Patch Size contributions were limited to those areas that were not found on agricultural capable soils or in urban areas. Under this scenario, these exclusions were the driving factor reducing the percent of the inventory available in each size class to contribute to the targets. As a result this scenario achieves 89.5% of the area of those patches greater than 200ha, 78% of those between 100 and 200ha, and 65% of those between 75 and 100ha. The two smaller classes still achieve their goal of including half of their area.

Figure 18: Forest Patch Size Performance Relative to Baseline Comparator



Within the Compromise Scenario, Forest Patch Size classes generally included in excess of 80% of what's available in the inventory and as a result the achievement relative to the baseline suffers somewhat proportionately.

Recommendations

Future analyses should consider determining more specific requirements for forest patch sizes in terms of total amount and distribution considering the fragmentation level of Niagara.

Add feature typing to the local ELC community mapping based on size thresholds and surrounding land use context to identify true forest habitats from more general wooded habitat types. There are many small wooded area polygons of mature trees in the mapping that are classified as forest communities that may provide refuge for species but do not necessarily provide true forest habitat. Consider a minimum patch size threshold for identification of forest patches.

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