



Forest Health Monitoring Update for Saint-Gaudens NHS: 2006 - 2018

The Story so Far...

Overall, the park's forest are relatively healthy, particularly when compared to other NETN parks further to the south. There are reasons for concern, however. Invasive species and their impact on forest regeneration is of particular concern.

Talkin' Bout Regeneration

Tree regeneration appears to be relatively stable overall, but varies across the park (Map 1). Regeneration tends to be lowest on steep ravines in the park. In fact, over the past 12 years of monitoring no seedlings or saplings have ever been found on the steep slope behind the Ravine Studio as severe erosion may be preventing trees from growing there.

Healthy forests typically have tree seedlings and saplings of varying sizes, whereas forests with a lot of deer tend to be dominated by seedlings less than a foot tall. The park appears to have a good range of tree sizes (Map 2), particularly saplings - although many of these are beech (more on that later).

Oh Deer

Some forests, including those of several NETN parks, have so many deer that the understory no longer has deer-preferred plants (like sugar maple seedlings and many wildflowers) and is instead dominated by deer-resistant species (beech trees, ferns and many invasive species). NETN monitoring over the past several years has shown a medium impact from deer. This is an increase from a low impact rating 6-8 years ago.

NETN forest crews keep track of whether seedlings and saplings in a forest are enough to replace the current canopy in the future, a measure called "stocking index" (Map 4). The more deer there are in an area, the more young trees are needed to accomplish this. Based on the most recent monitoring, if deer impacts reach high levels about 20% of the forest is sufficiently stocked with about 40% being severely understocked. That said, much of this area of the forest is dominated by mature hemlock trees which typically have low regeneration

rates and the stocking index may not be as informative for these areas.

Life's a Beech

American beech trees dominate the regeneration layer in about half of the park (Map 5). This is concerning because beech bark disease eventually kills trees and limits their ability to be a long-lived canopy tree. Dying trees often sprout many 'suckers' (clones of the parent tree) that can form dense thickets and suppress other tree regeneration and reduce native forest plant diversity.



Beech leaves

Some sections of the forest are largely made up of low canopy species that rarely, if ever, grow tall enough to be part of the forest canopy (striped maples for example). These species contribute to overall forest diversity and structure, but deer-resistant low canopy species have been shown to increase in areas with high deer densities to the point where the regeneration of other tree species is suppressed.

The most common tree species represented in the park's forest canopy are, in order: eastern white pine, eastern hemlock, and northern red oak (Map 6). The future of hemlock in the Northeast is threatened by the invasive hemlock woolly adelgid insect, which was found in Sullivan County, NH in 2014 and could spread to the park soon. Once infested, hemlock trees generally die in 10 to 20 years. Areas of the park dominated by hemlock, particularly in the Ravine, are most the vulnerable and should be checked for signs of the insect each spring if possible.

The Brutish Invasion

Park priority invasive species were detected mostly at low levels, except for a particular site in the northwest corner of the park (Maps 7 and 8). A dense thicket of exotic bush honeysuckle and Japanese barberry has taken hold there and has remained at steady levels the past several years. Of more concern perhaps is

Bottom Line:
Park Forests are Doing
Well But There is Reason
for Concern





Beech trees stressed from beech bark disease are producing many dozens of 'root suckers' in some parts of the park. NPS photo.

that NETN monitoring has shown a slow but steady increase in invasive species across the park since monitoring began 12 years ago. Norway maple trees, glossy buckthorn, and multiflora rose appear to be spreading into new populations. They are still relatively small and sparse, however, and should be high priority for management.



Though most people don't realize it, earthworms that escape to the forest are considered to be invasive. Since at least the end of the most recent ice age, these slimy critters are not native to the northeast - having been scoured away by tons of ice. Along with overabundant deer and invasive plants, they have been linked to losses in native plant diversity in forests. Earthworms are widespread across the park. In fact all of the places with invasive plants also had invasive earthworms, though not all areas with earthworms had invasive plants (Map 9). Crazy-snake worms, which were recently detected nearby parks, were not found in Saint-Gaudens in 2018 (see the [NETN Species Spotlight article](#) on crazy snake-worms for more on these slimy critters). However, the timing of park sampling was not ideal for distinguishing snake worms from the more common European earthworms, and they may have just gone undetected.

Par for the Coarse

Coarse woody debris (CWD - large pieces of dead and downed wood on the forest floor) is an important component of a healthy forest ecosystem. CWD levels have been relatively stable across the park (Maps 10 and 11). In a couple areas where several large conifers fell between NETN visits, considerably more CWD volume was added. According to a recent study of temperate and boreal forest organisms dependent on dead wood, just over half of the park forest meets the minimum to support these species, with some areas well above minimums. It is important to note, however, that very large CWD pieces, which are important habitat for species like American marten and black bears, may still be lacking in the park.

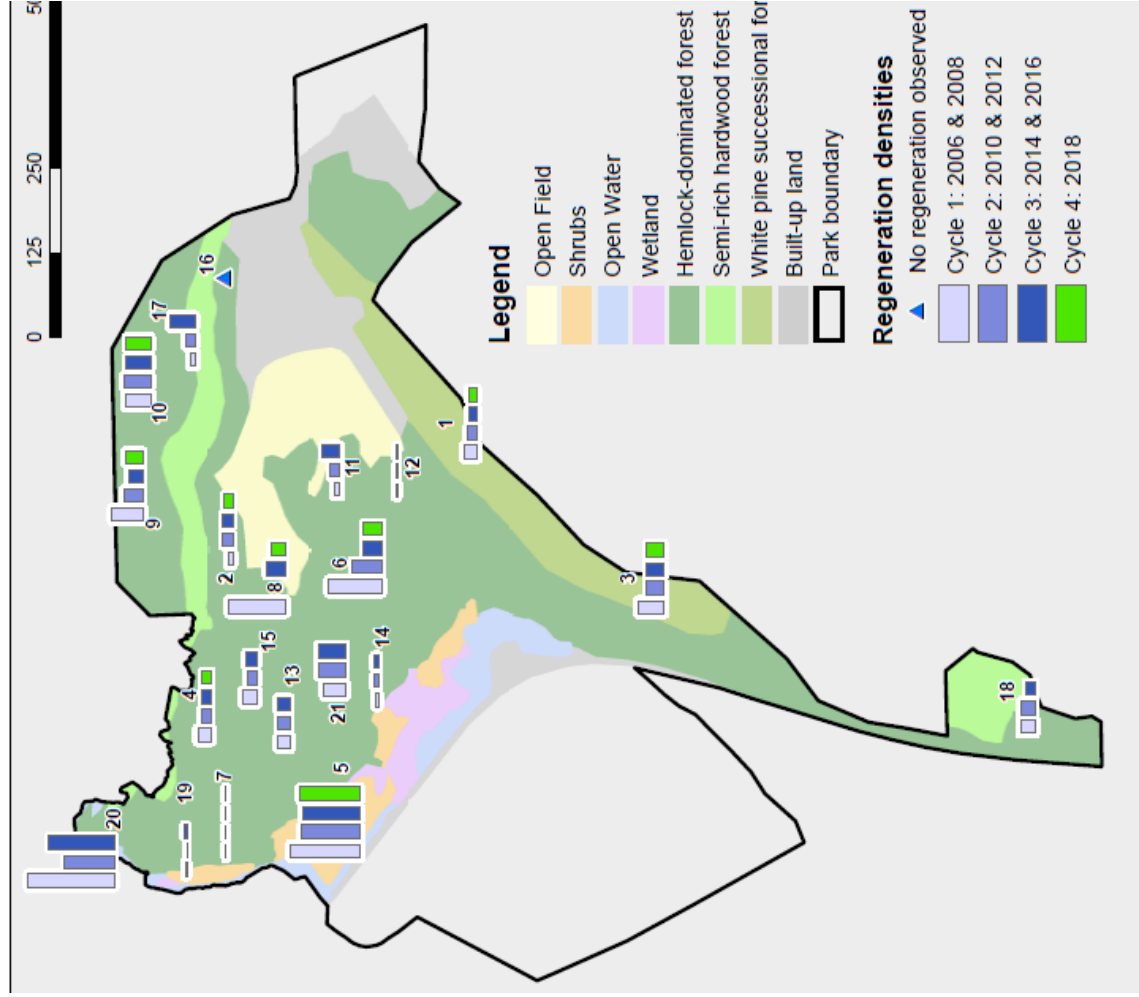
Monitoring Maps and More Detailed Information

A brief explanation of the following monitoring maps: the number next to the pie/bar charts is the NETN forest monitoring plot number. Each plot is monitored once every 4 years. Pie chart size relates to the overall density of vegetation per plot. Bar chart length represents density over time per plot. See NETN's Forest Health Monitoring webpage for access to the full monitoring summary. Also view or download other forest health related materials. <https://www.nps.gov/im/netn/forest-health.htm>

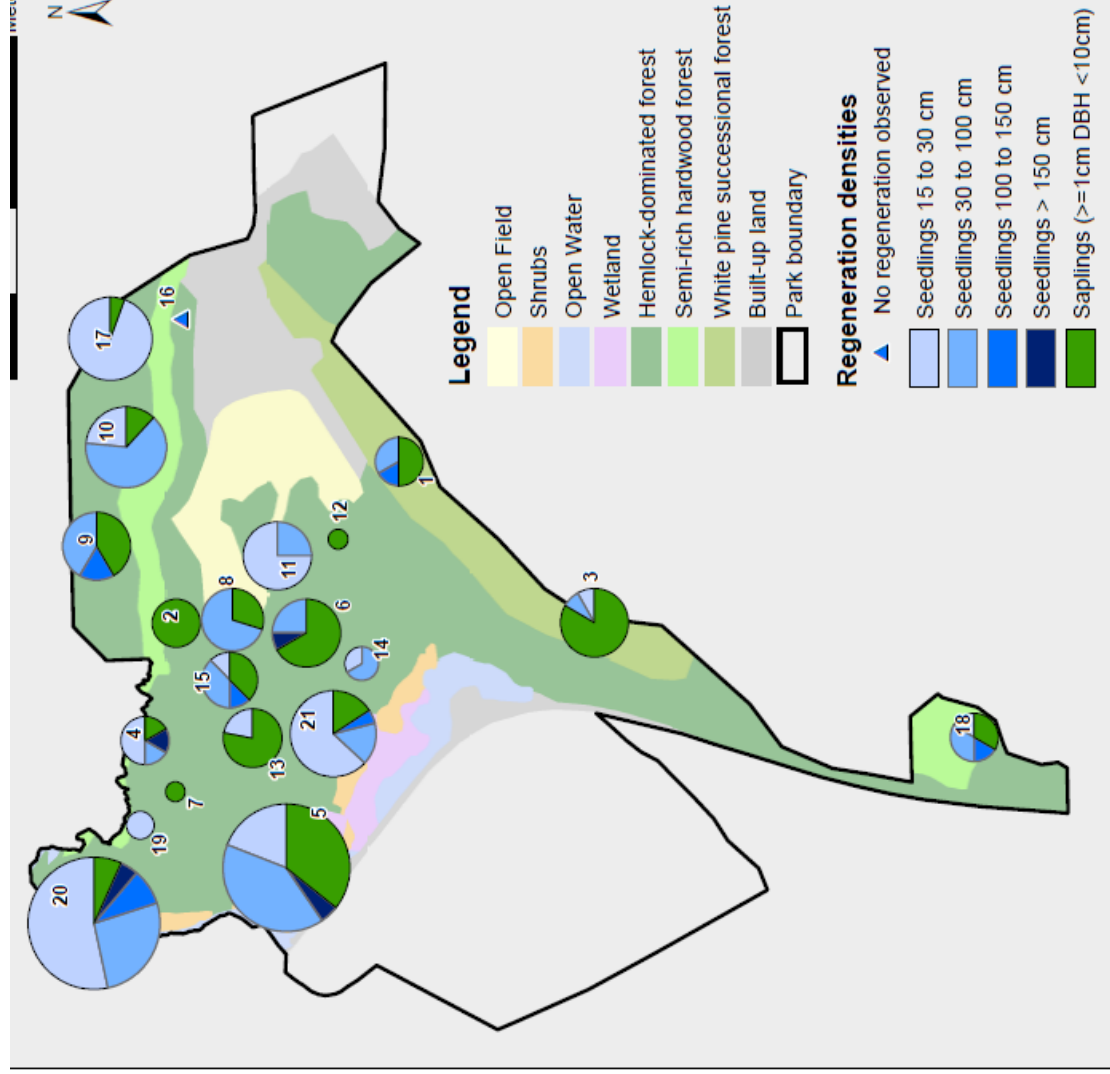


Forest Health Monitoring Maps for Saint-Gaudens NHS: 2006 to 2018

Map 1 - *Regeneration by Cycle*

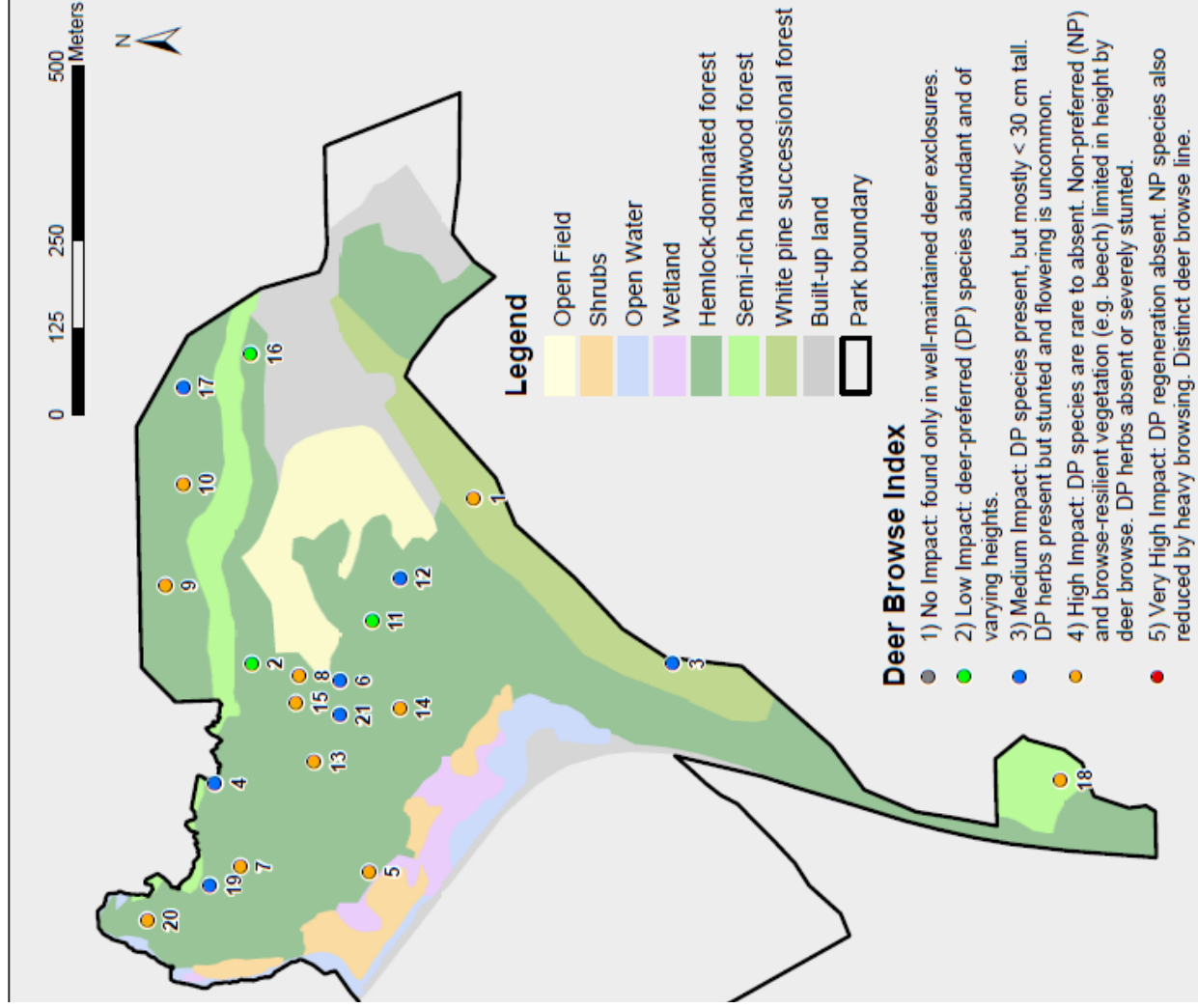


Map 2 - *Regeneration by Size Class*

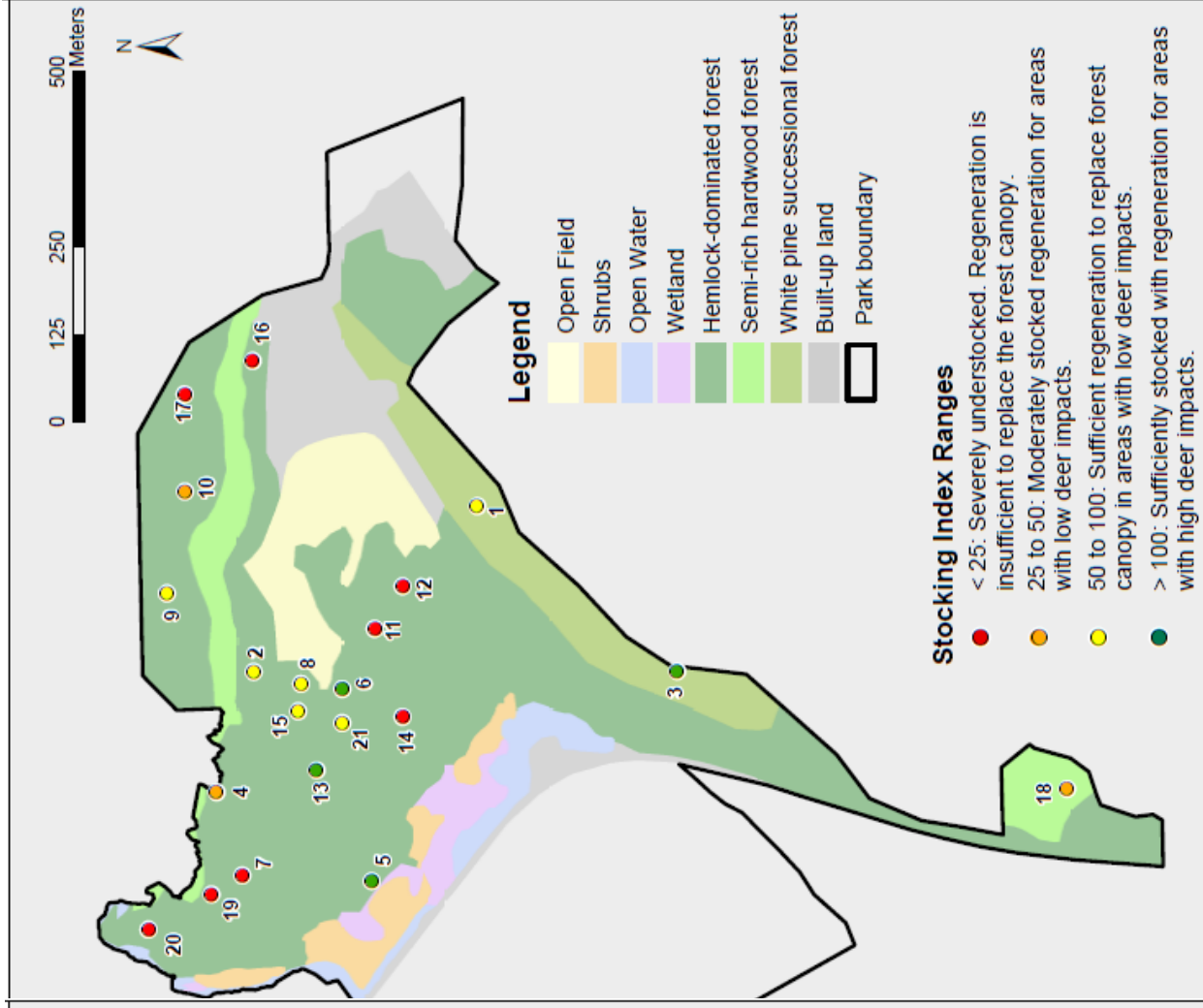


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Map 3 - Deer Browse Impacts

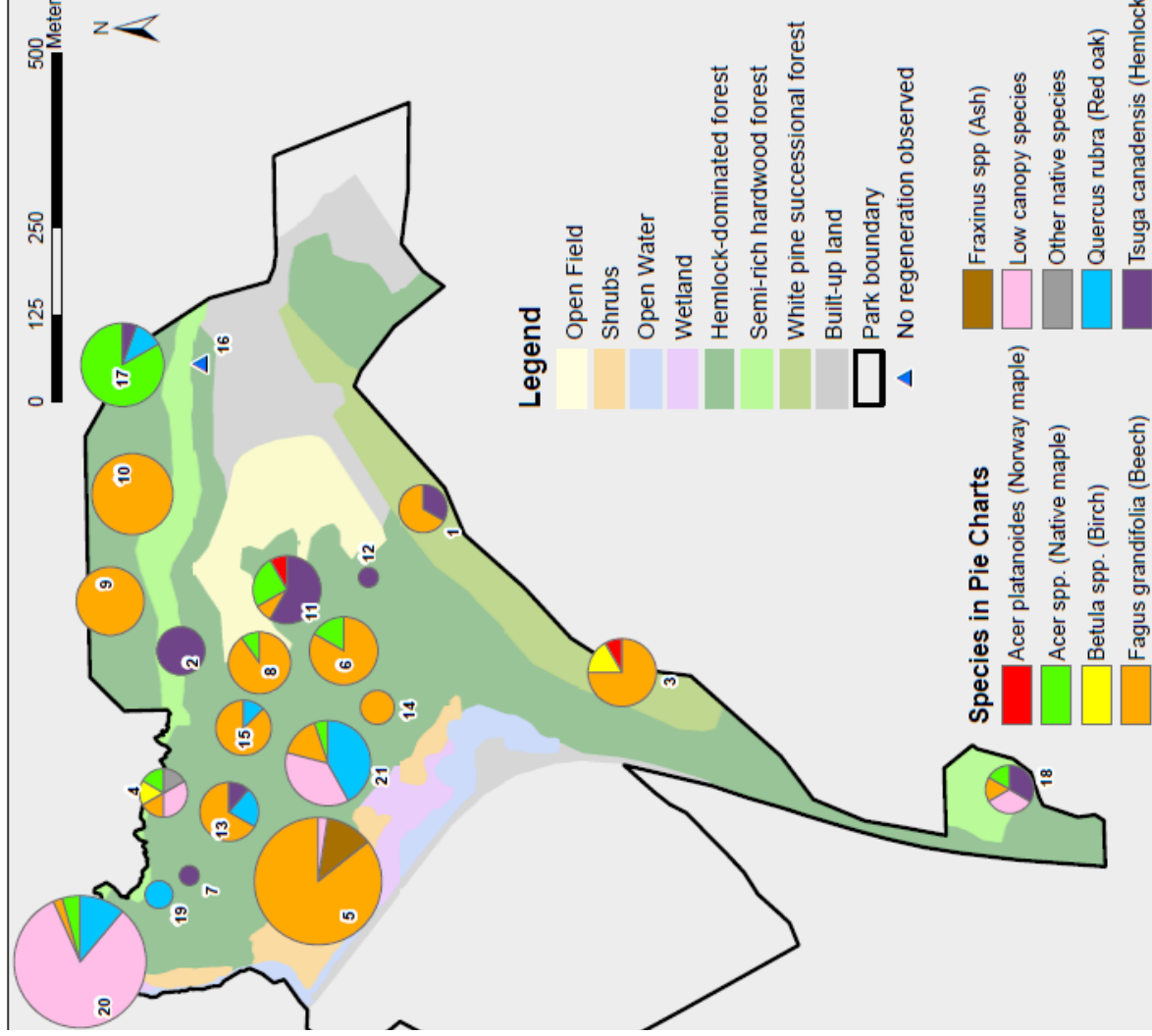


Map 4 - Regeneration Stocking Index

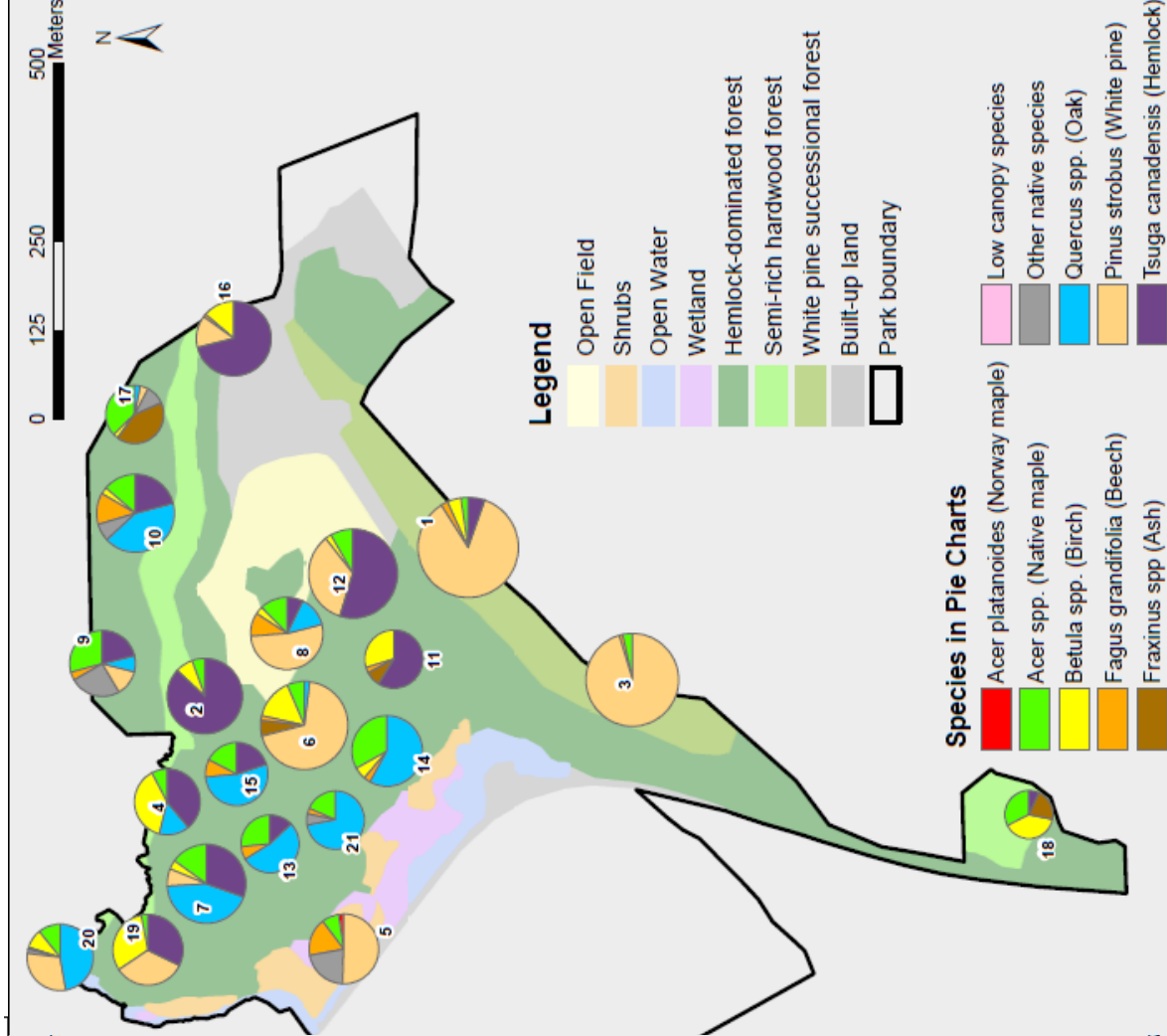


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Map 5 - Regeneration Composition



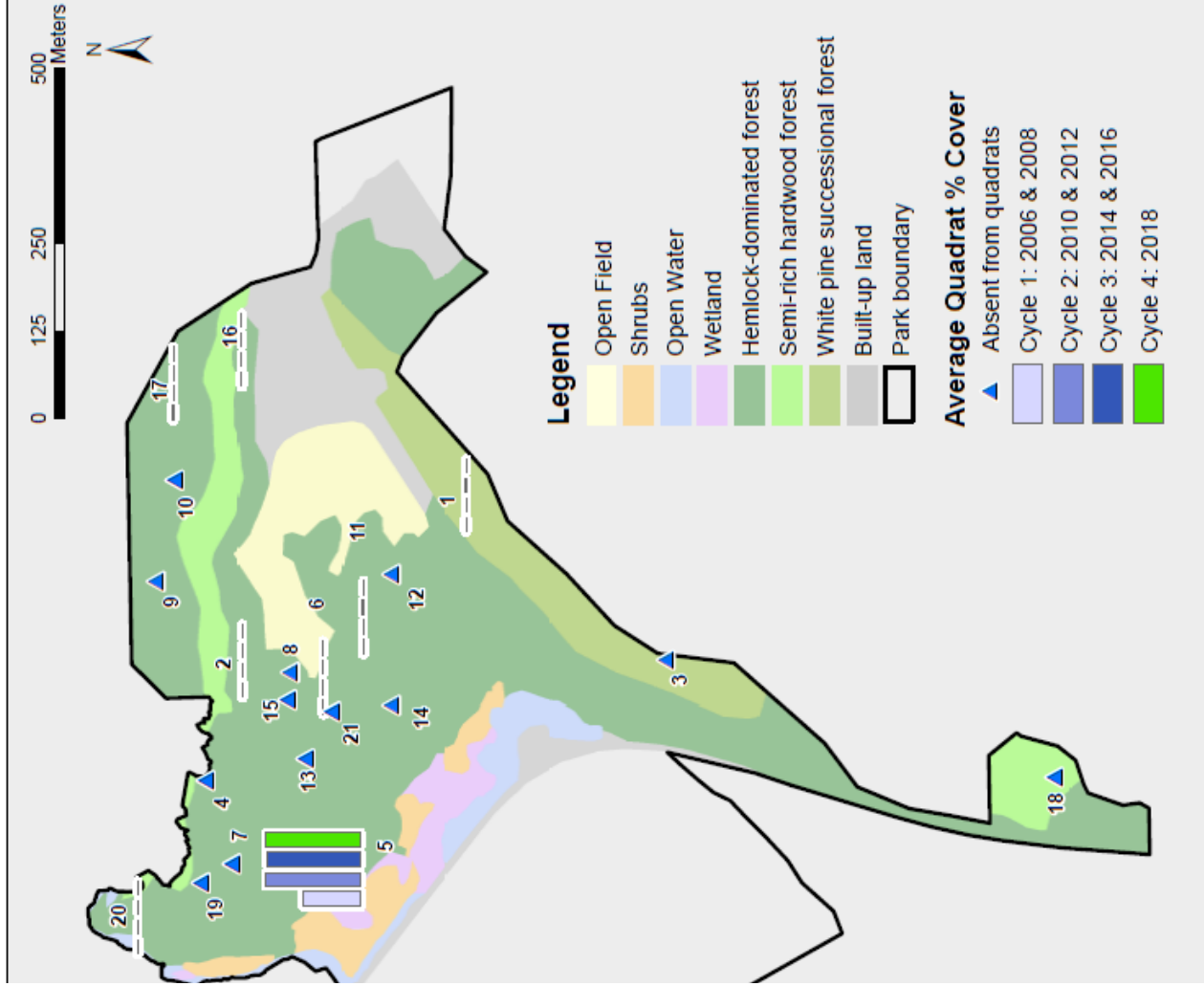
Map 6 - Canopy Tree Composition



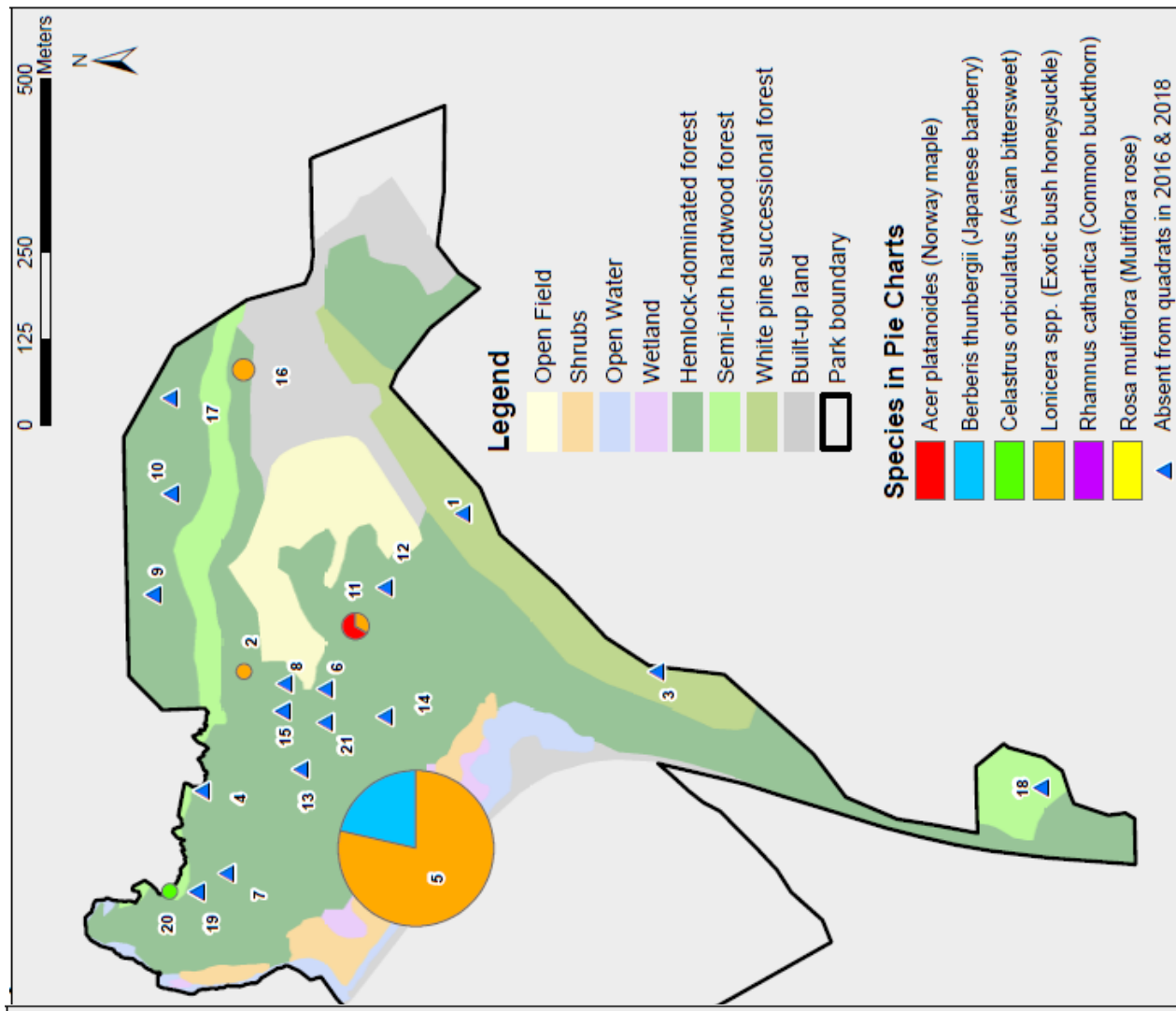


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Map 7 - *Priority Invasive Species Cover*



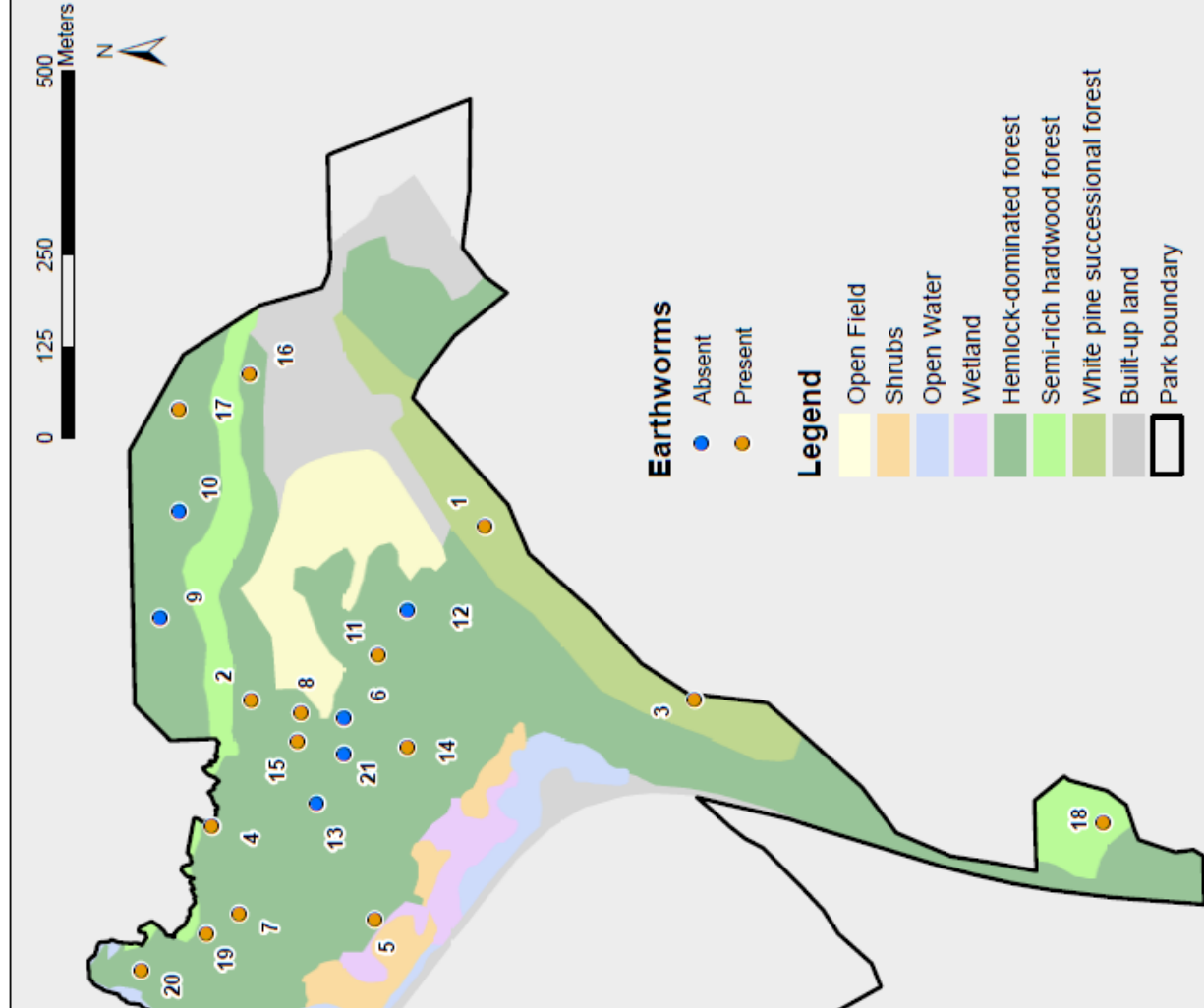
Map 8 - *Priority Invasive Species*



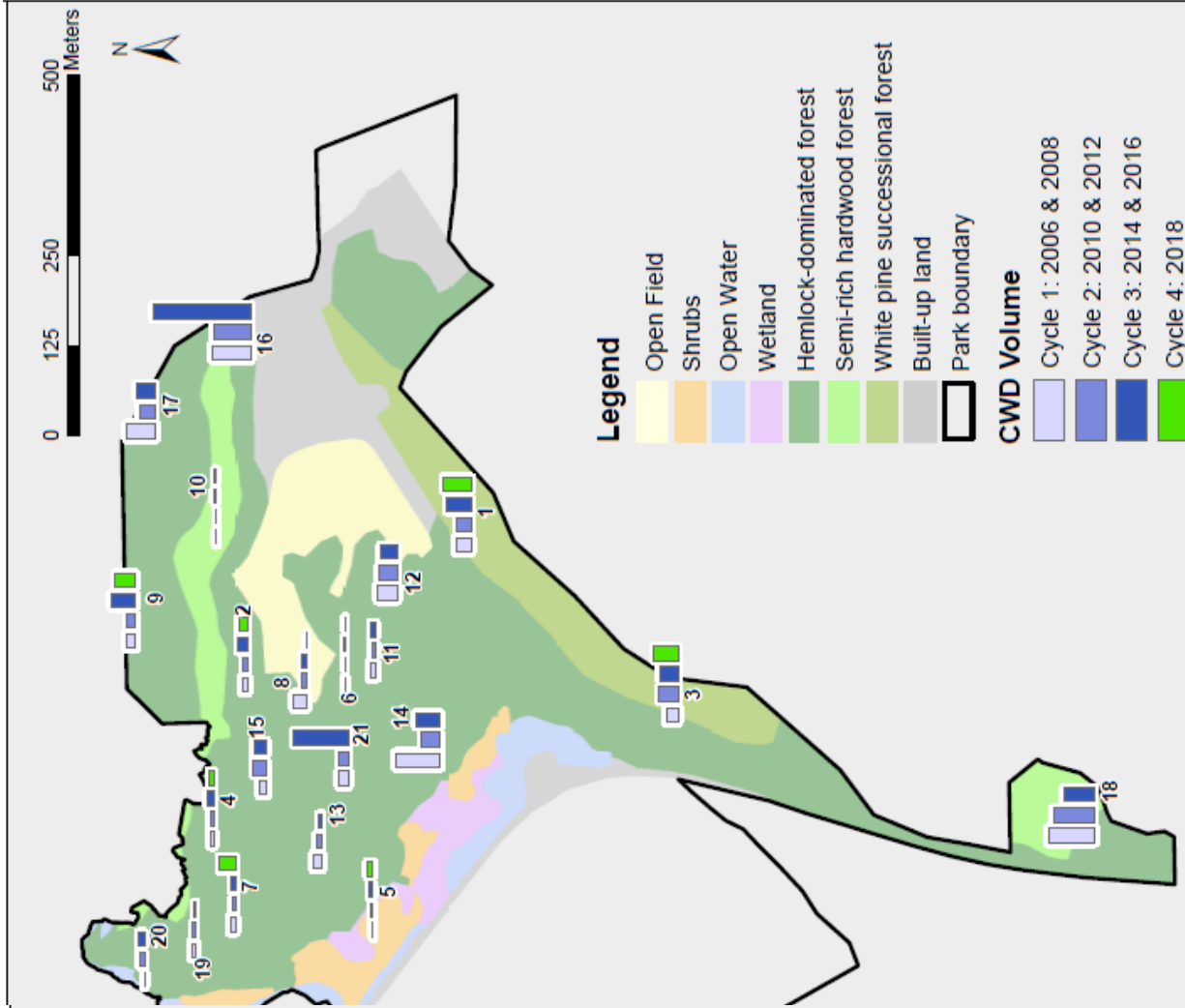


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Map 9 - *Earthworm Presence*



Map 10 - *CWD by Cycle*





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Map 11 - CWD Levels: 2016 and 2018

