DEER IMPACTS ON TREES AND WILDFLOWERS IN ANN ARBOR, 2018–19

Vegetation in Ann Arbor natural areas has been monitored for deer impacts since 2015, starting with red oak seedlings in 2015–16 and expanding in 2016–17 to include trillium populations and experimental plantings of forest wildflower species important for pollinators. Monitoring of trees and wildflowers in 2018–19 showed high deer impacts across all metrics for experimental red oak seedlings, experimental wildflower plantings, and trillium exclosures. Key findings are summarized here; additional details are provided in separate reports.

RED OAK SEEDLINGS

- 456 seedlings were planted in a total of 15 sites in 2018 and monitored for one full year for deer browse to serve as a standardized gauge of deer impacts across parks.
- Deer browsed 58% of red oak seedlings overall, with 10 of 15 sites having browse levels of 50% or more.
- At 7 of 9 sites where deer were managed (within 3/8 mile), browsing on oaks decreased or stayed the same, the other 2 increased slightly. At 3 of 4 unmanaged sites, deer browse levels increased or stayed similar.
- Despite decreases, deer browse levels at all sites were above the 15% level beyond which oak regeneration may decline, with levels of 40% or more at every park except one (which had 18%).

## WILDFLOWER EXPERIMENTAL PLANTINGS

- 2,000 plants of 10 species were transplanted into 5 pairs of fenced and unfenced experimental plots in each of 5 sites in 2017 and 2018.
- Deer browsed 70% or more of planted asters and goldenrods across all sites; deer browse levels were higher on these wildflower experimental plantings than on red oak seedlings planted in the same plots.
- Deer were associated with higher *mortality*, but the more notable impact was significantly lower *% flowering* and *total # flowers* at all sites when comparing unfenced (deer-accessible) to fenced plots.
- Reductions in *flower #* due to deer browsing led to significant reductions in the # of pollinator visitors observed in a pilot study.

TRILLIUM EXCLOSURE STUDY

- 5 pairs of fenced and unfenced plots of trillium were monitored in 5 sites from 2016–2018, including over 1,075 plants.
- Deer were linked to lower trillium abundance overall, with unfenced deer-accessible plots having significantly fewer plants than fenced plots by 2018 (numbers were similar when plots were placed in 2016).
- Deer were linked to significantly lower trillium flowering, with unfenced deer-accessible plots having only 1/4 to 1/10 as many flowers as fenced plots in 2018 (totaled within sites) despite having similar initial numbers.
- Deer browse levels on trillium in 3 of 5 sites are above the 5–15% level that previous studies have shown will allow for persistence of trillium populations over time.

In sum, although deer management in 2016–2018 has stabilized or somewhat reduced deer populations in targeted sites, deer continue to damage plants at levels that can inhibit forest regeneration, lead to declines in trillium populations, and reduce forest wildflowers that provide important resources for pollinators and wildlife.

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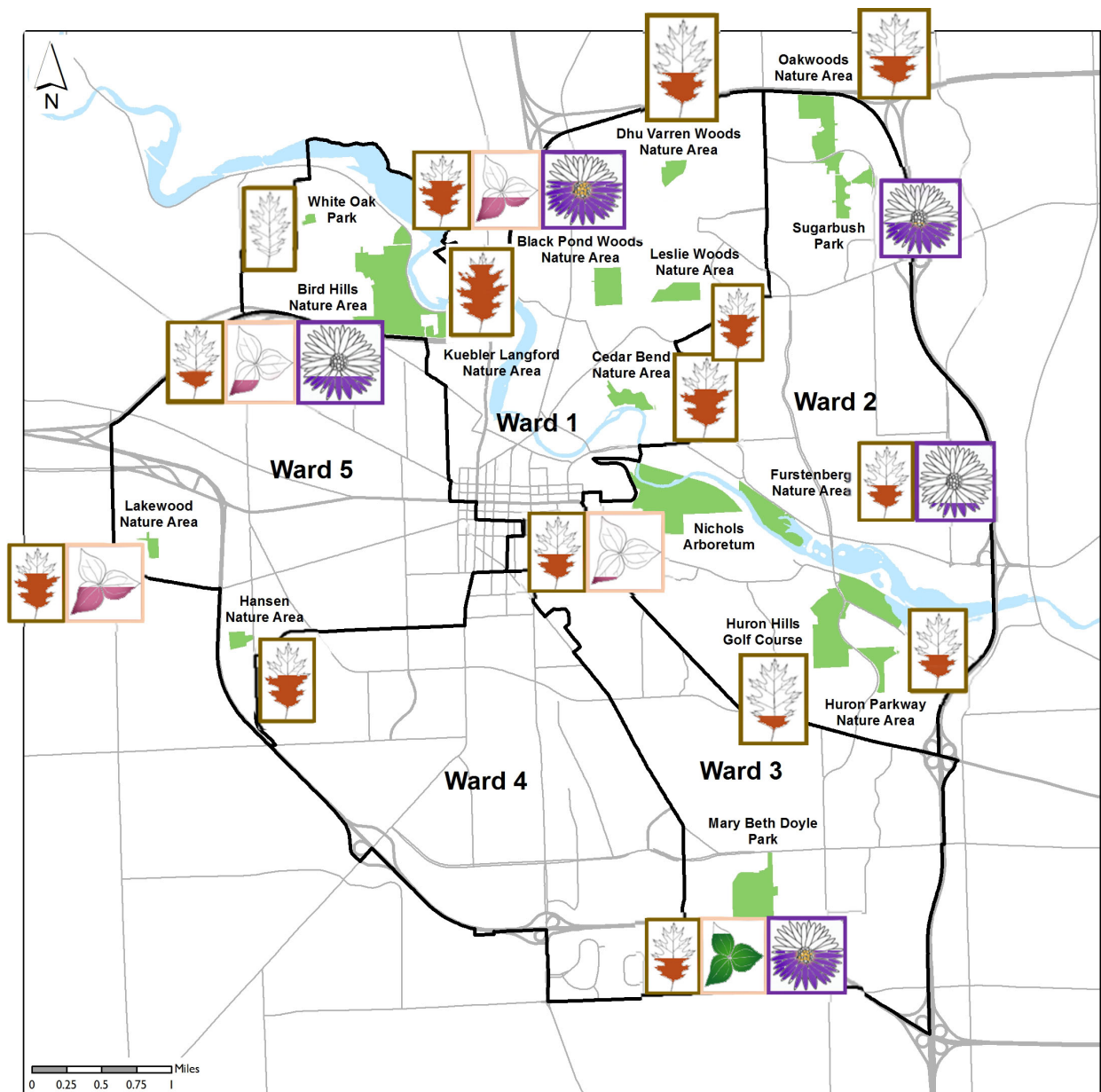
Overview of deer impacts by natural area

% oaks deer browsed: red removed from the oak leaf icon indicates the % of oaks browsed (fully red leaf = 0% browsed; fully white leaf = 100% browsed).

 # flowers: purple removed from the flower indicates the reduced flowering, showing the total # flowers in deer-accessible unfenced plots as a proportion of # flowers in fenced plots protected from deer (more white shows a greater reduction in flowering).

 # trillium flowers (pink) **or # trillium plants** (green): amount of shading shows # flowers in unfenced plots as a proportion of # in fenced plots—the more the shading is removed, the lower the number of flowers or plants in unfenced compared to fenced plots. At Mary Beth Doyle, there was no difference in *# flowers*, so the figure shows changes in abundance (*# plants*).