Historic Forest Cover Vision for the Future
The Regional Municipality of York, ON

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Context of the problem

- **200 years of intense human activities**

- **Deforested landscape**

- **Further fragmentation and degradation**

- **Forests compositionally and structurally changed**
  - **Average forest age of 47 to 53 years (Riley et al. 1998).**

- **Lack of ecologically-based management**
  - **Management focuses on the current status**

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Ecologically-based forest conservation and management

- **Landscape approach**
- **Protection and restoration of native forest types**
- **A knowledge of "what is present and what is missing"- gap analysis**
- **Requires reference vegetation condition**
  - **A predictive model to relate plant community composition to physical variables - Potential Natural Vegetation (PNV)**

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Existing Forest Cover

The Region of York
Lakes and major rivers
Yonge St.
Existing forest cover, developed, and agricultural lands
Agricultural land
Coniferous mid-age to mature
Coniferous plantations
Coniferous young/pioneer
Deciduous mid-age to mature
Deciduous young/pioneer
Developed land
Lakes
Mixed mid-age to mature
Mixed young/pioneer

Joker's Hill

N

Yonge
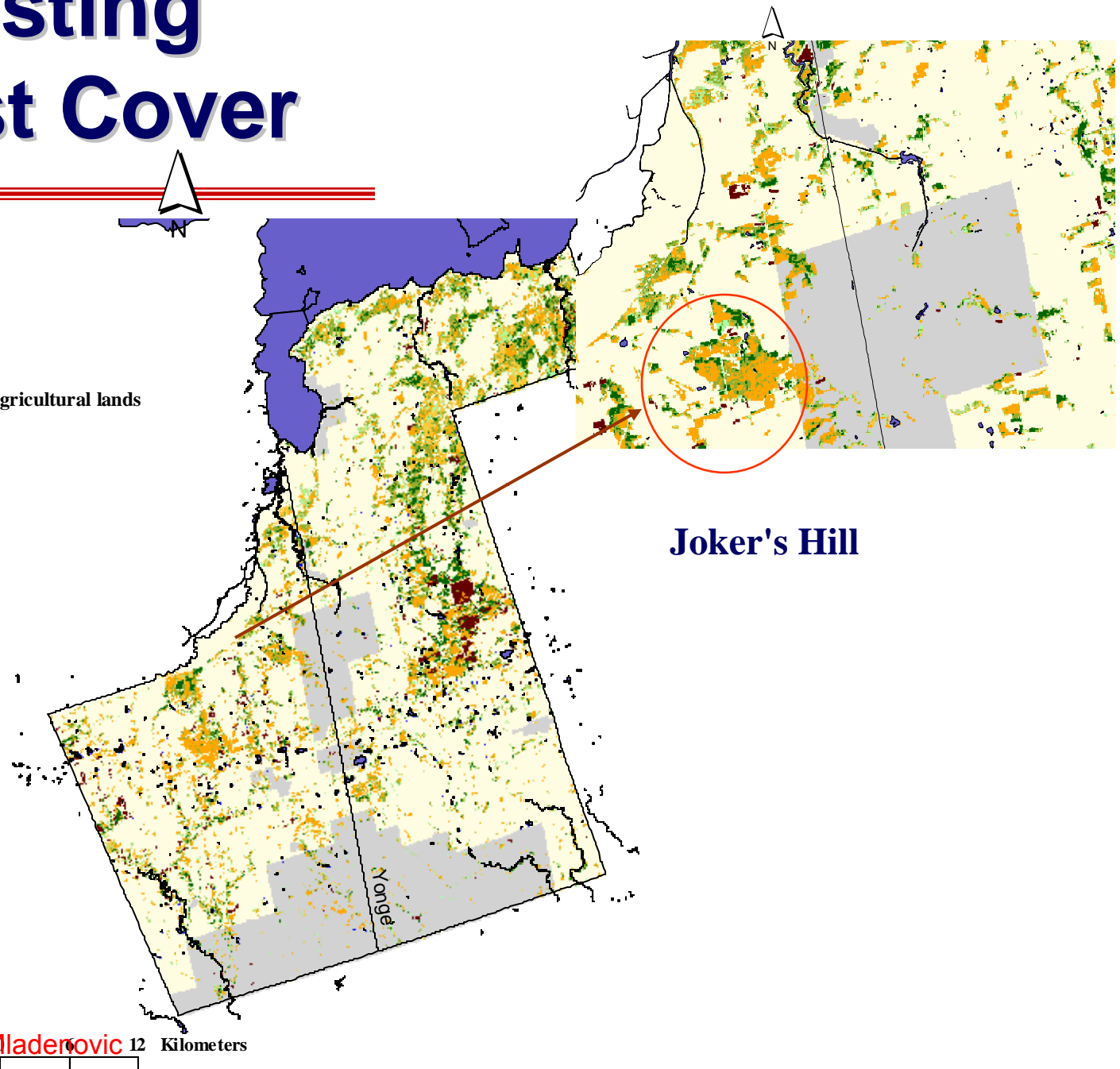
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0   6   12   Kilometers

Existing Forest Cover

- **38,000 ha are currently under forest**

- **22% forest cover**

- **16% if young and successional forest patches are excluded**

- **young and successional forest:**
  - **the southern part 36%**
  - **the Oak Ridges Moraine 16%**
  - **the northern part 29%**

6%

25%

69%

- ■ mid-age to mature
- ☐ early successional and young forests
- ■ plantations

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Potential Natural Vegetation

Historical Information

Existing Vegetation

GAP Analysis

Conservation and management objectives

Conservation and Restoration Priorities & Management directions

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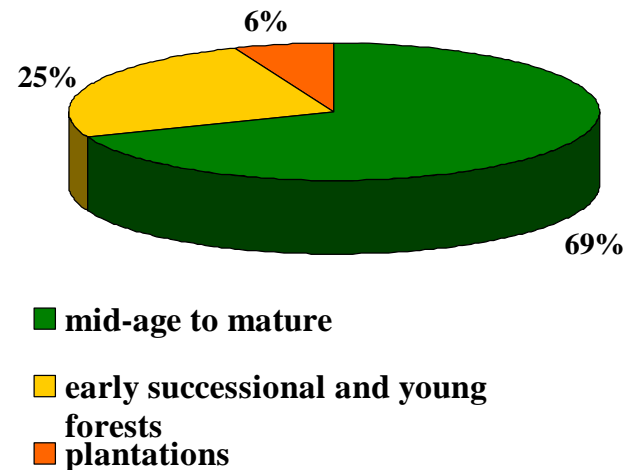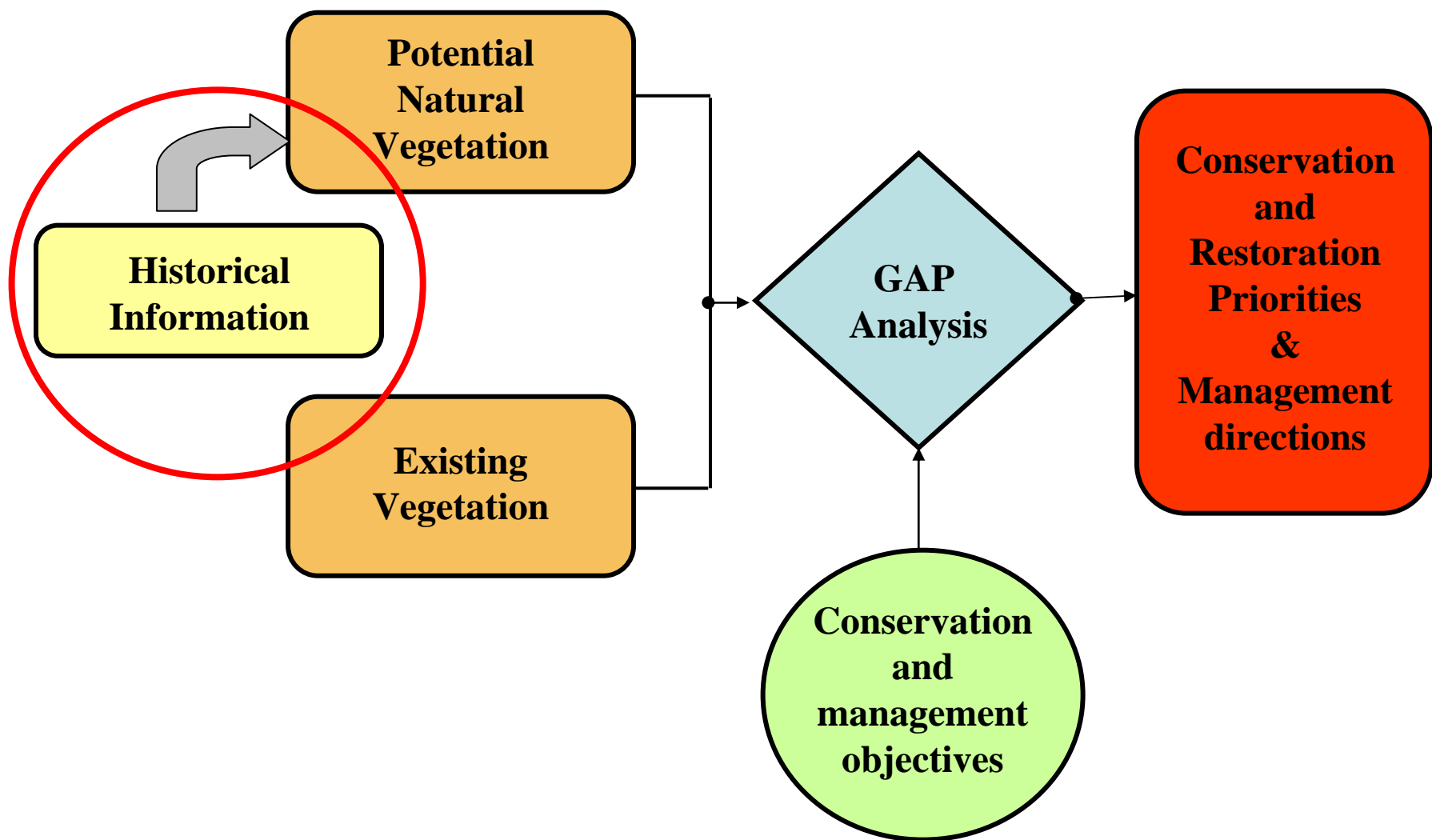
Historical Forest Cover

- **At least 80% of the region was forested**

- **Mature and diverse forests**
  - sugar maple-beech, sugar maple-beech-white elm, sugar maple-beech-basswood, sugar maple-beech-basswood-white elm, and sugar maple-beech-white pine

- **Disturbances**
  - windfalls approximately 3.5% of the area

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Pre-settlement Forest Cover

- *In the northern parts of the region, coniferous forests, dominated by hemlock, cedar and white pine were the prevalent vegetation. Tamarack, cedar and spruces dominated the wet areas mostly north of the Oak Ridges Moraine, with a few pockets along the Moraine.*
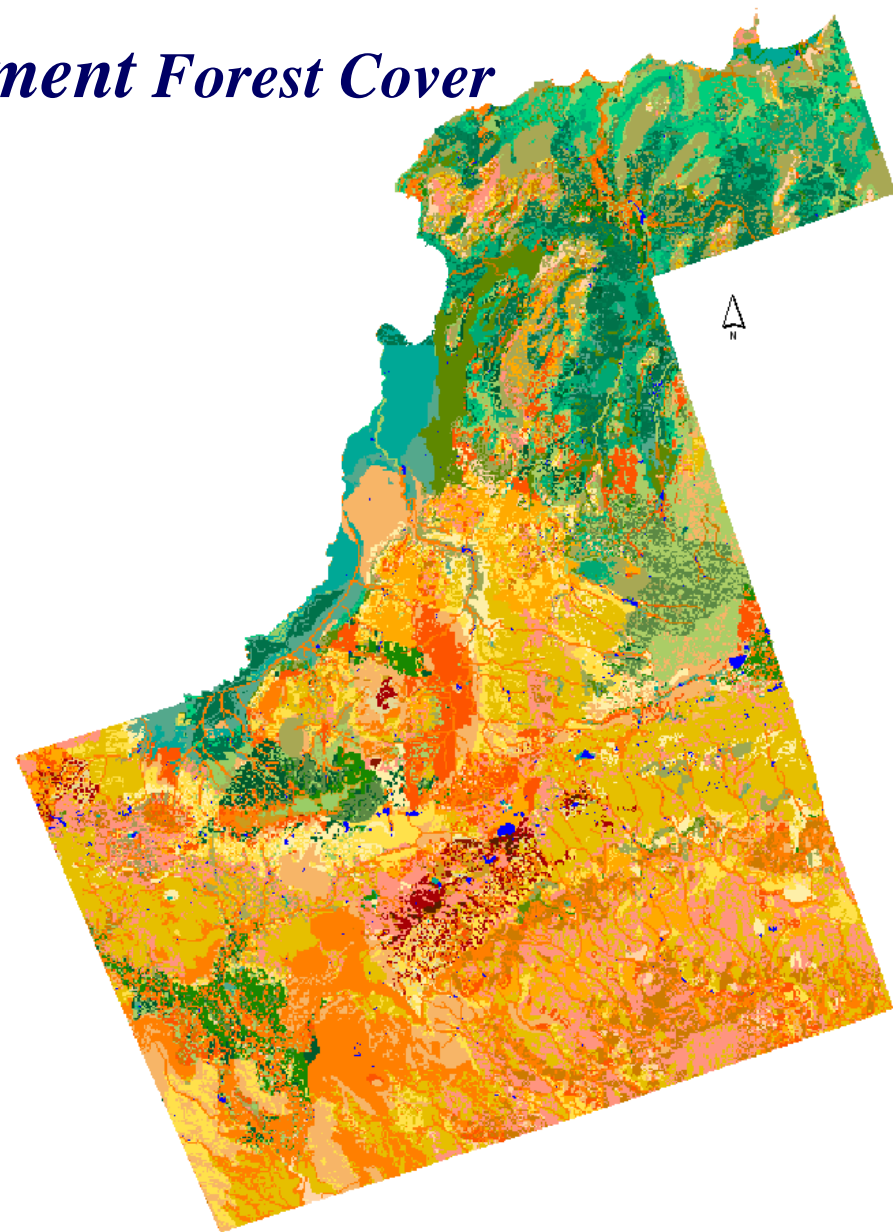

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Pre-settlement Forest Cover

Species assemblages level 2

- beech
- beech-basswood
- cedar
- cedar-mixed
- cedar-spruce
- cedar-spruce-tamarack
- cedar-tamarack-mixed
- deciduous-mixed
- elm-mixed
- elm-oak
- hemlock
- hemlock-cedar-birch
- hemlock-cedar-coniferous
- hemlock-cedar-mixed
- hemlock-maple
- hemlock-mixed
- hemlock-pine
- lakes
- maple
- maple-basswood
- maple-basswood-elm
- maple-beech
- maple-beech-basswood
- maple-beech-basswood-elm
- maple-beech-elm
- maple-beech-hemlock
- maple-beech-mixed
- maple-beech-oak
- maple-elm
- maple-mixed
- maple-oak-pine
- oak
- oak-mixed
- pine
- tamarack

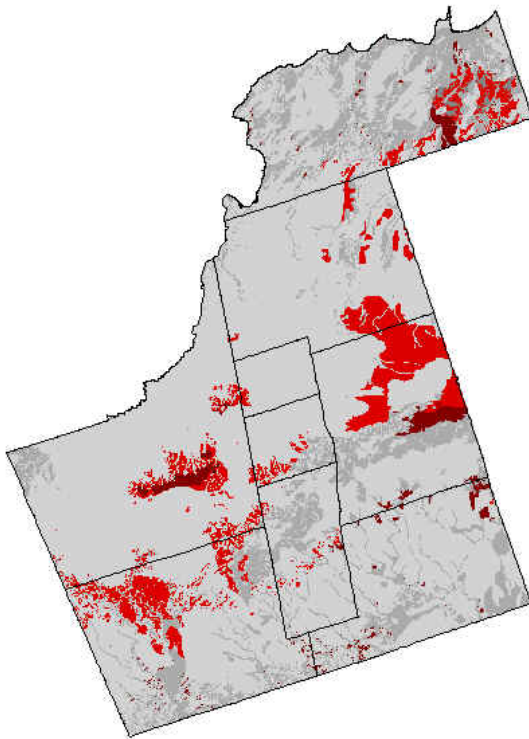0   5   10   15   20   25   Kilometers
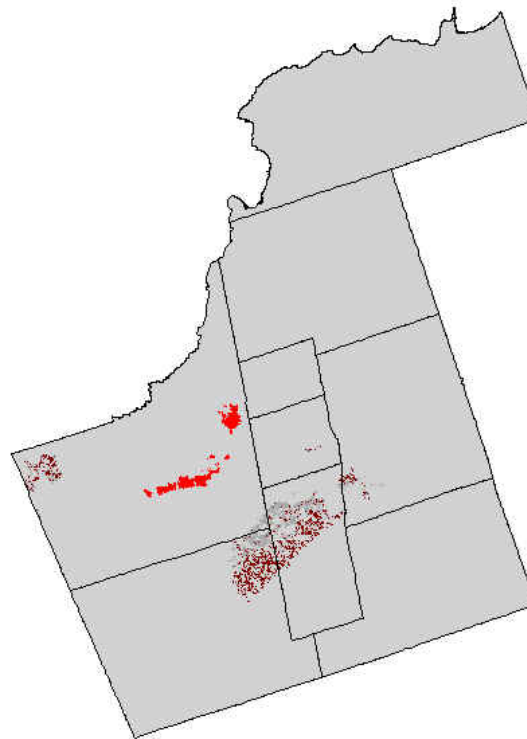
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PNV

PNV is defined as the biotic potential of a region with regard to site conditions relevant to vegetation development (Ricotta et al. 2000).
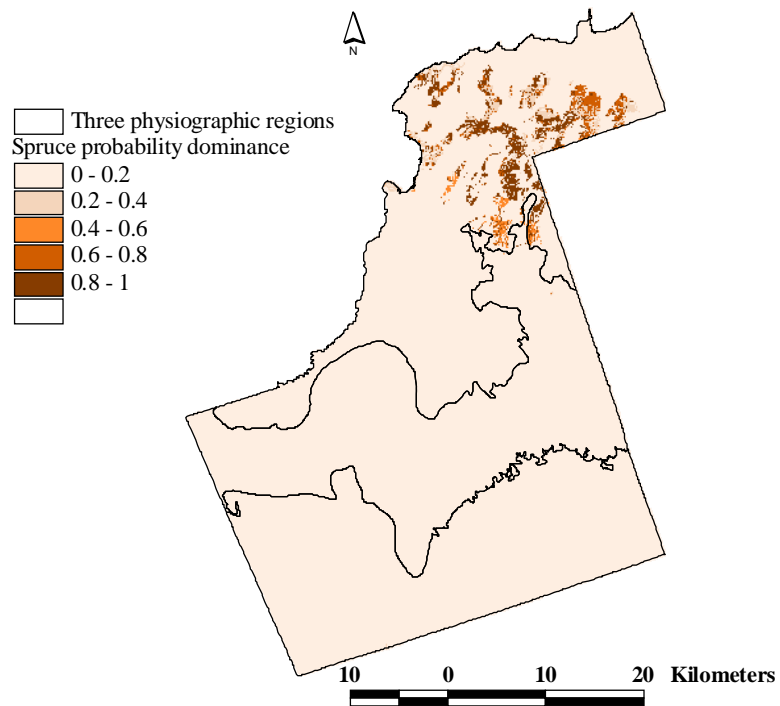
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- *White pine was often found in the maple-beech forest, but also formed pure pine stands on the dry, sandy soils of the Oak Ridges Moraine.*
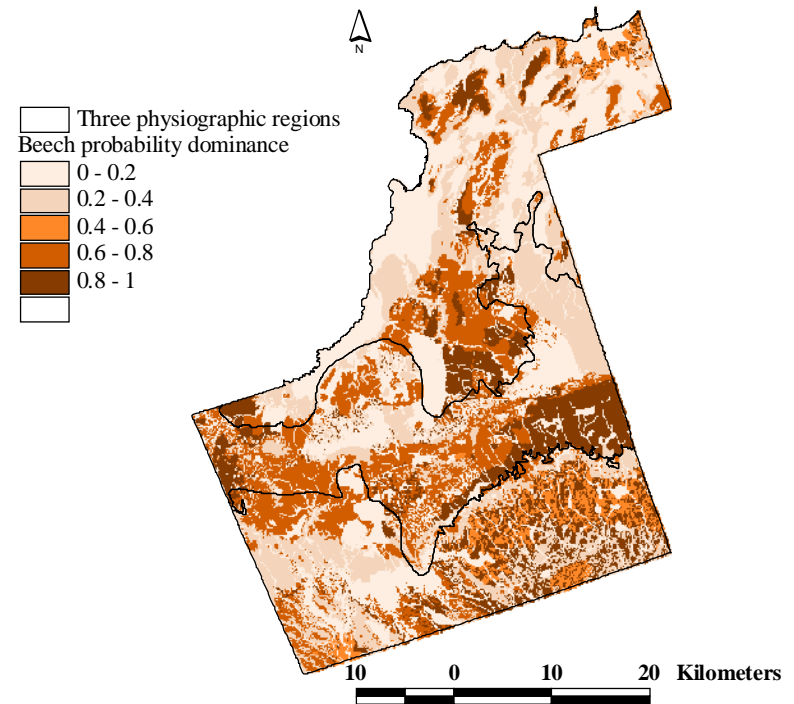

- *Oaks were particularly frequent on the south ridges of the moraine as well as in the north in today's Newmarket and Holland Landing areas.*
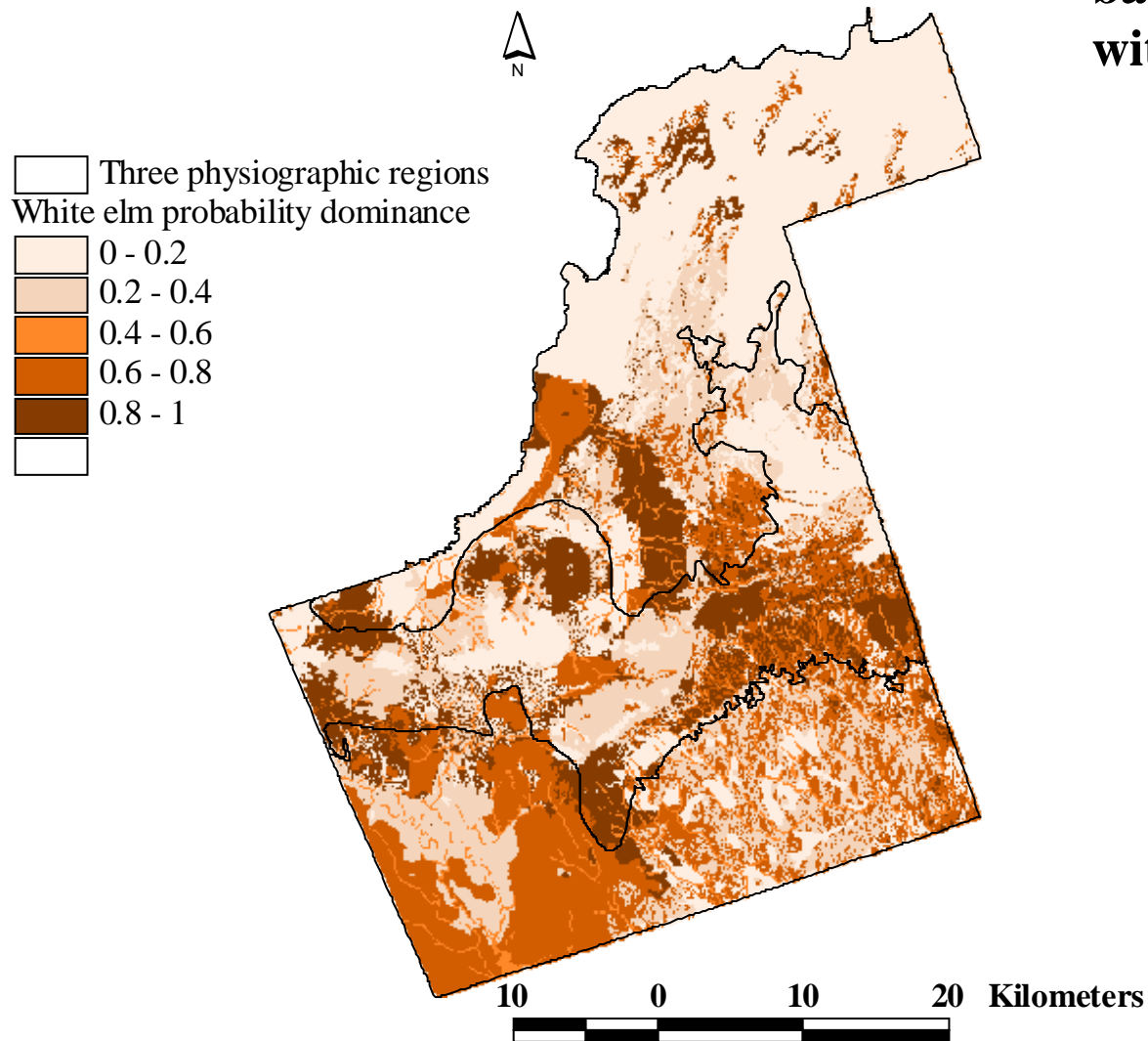

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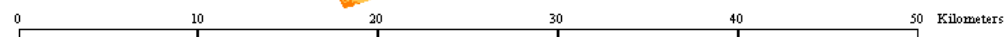
Spruce

Beech

Three physiographic regions
Spruce probability dominance
- 0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1

10   0   10   20   Kilometers

Three physiographic regions
Beech probability dominance
- 0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
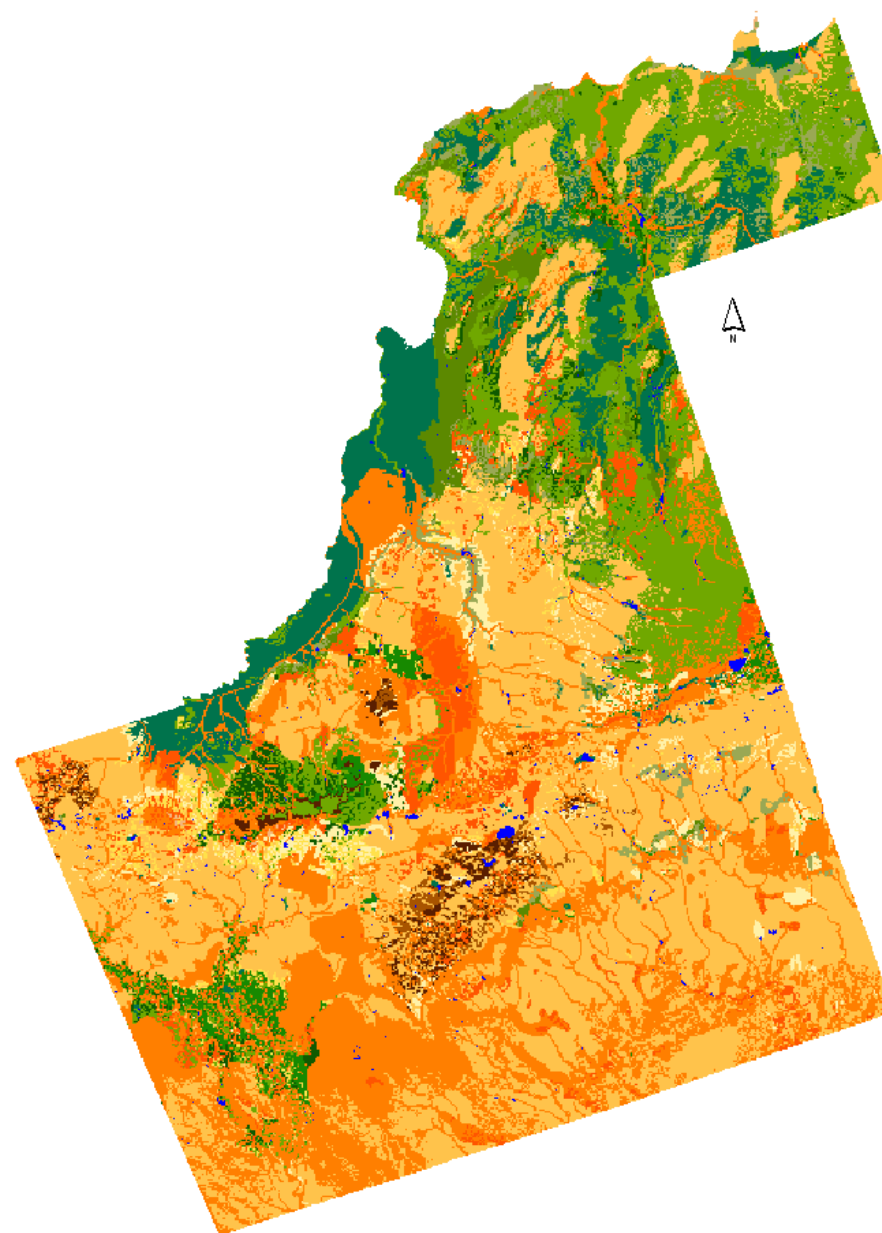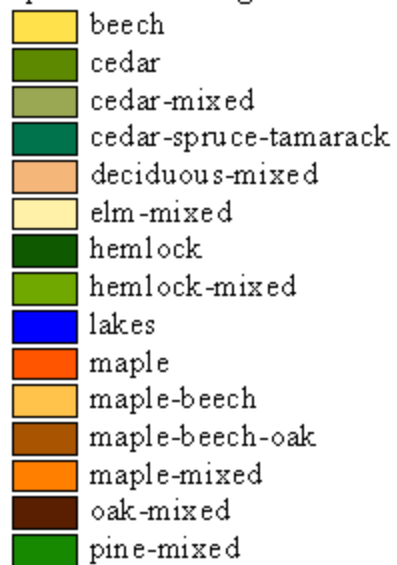- 0.6 - 0.8
- 0.8 - 1

10   0   10   20   Kilometers

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White elm

- **In 91% cases associated with maple, in 65% of cases with basswood, and in 52% of cases with beech.**

Three physiographic regions
White elm probability dominance

- 0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1

N

10   0   10   20   **Kilometers**

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Species assemblages level 3
- beech
- cedar
- cedar-mixed
- cedar-spruce-tamarack
- deciduous-mixed
- elm-mixed
- hemlock
- hemlock-mixed
- lakes
- maple
- maple-beech
- maple-beech-oak
- maple-mixed
- oak-mixed
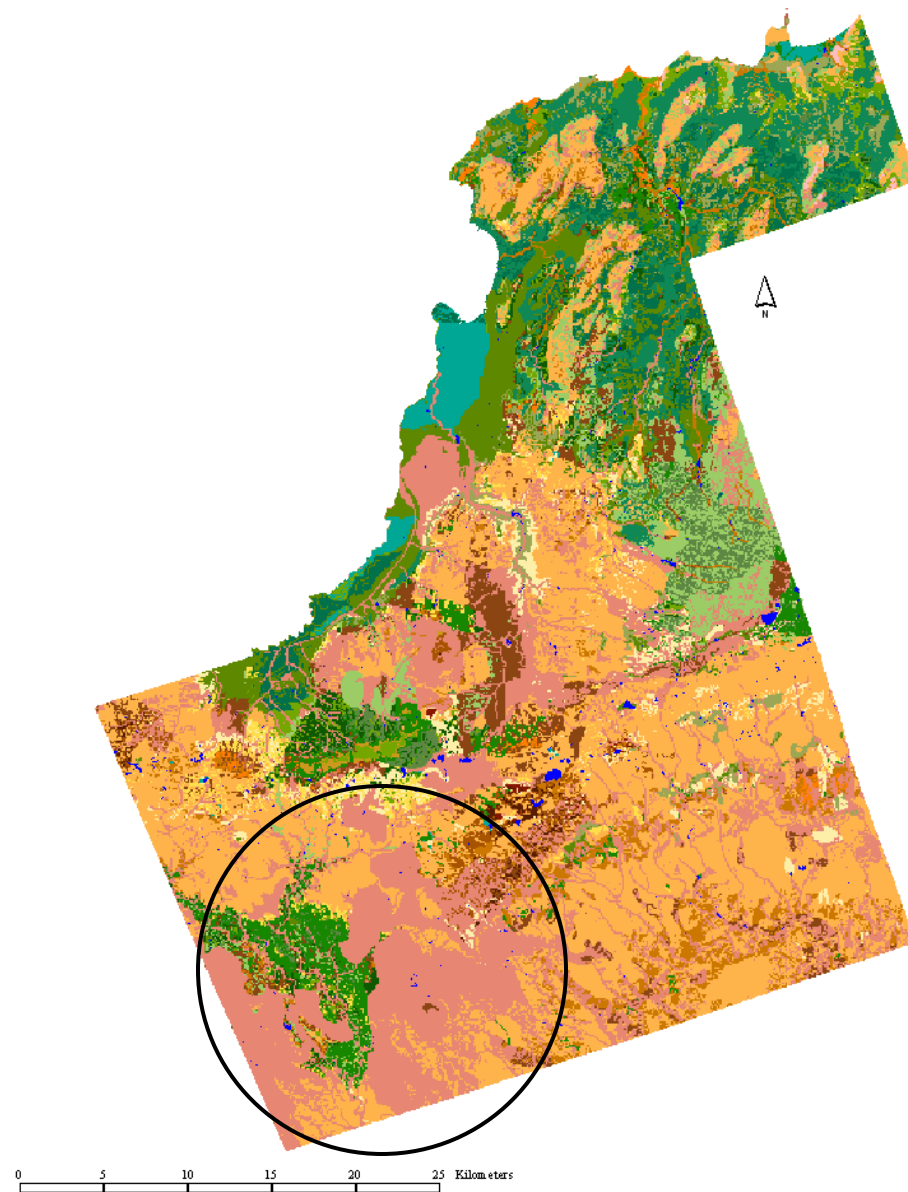- pine-mixed

0   10   20   30   40   50 Kilometers

Species assemblages level 3

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Modified ELC vegetation types

- ash/yellow birch
- beech
- cedar
- cedar-hemlock
- cedar-mixed
- elm
- hemlock
- hemlock-mixed
- hemlock-pine
- maple
- maple-basswood
- maple-beech
- maple-beech-oak
- maple-birch
- maple-conifer
- maple-elm
- maple-hemlock
- maple-mixed
- maple-oak
- maple-oak-pine
- oak (red)
- pine
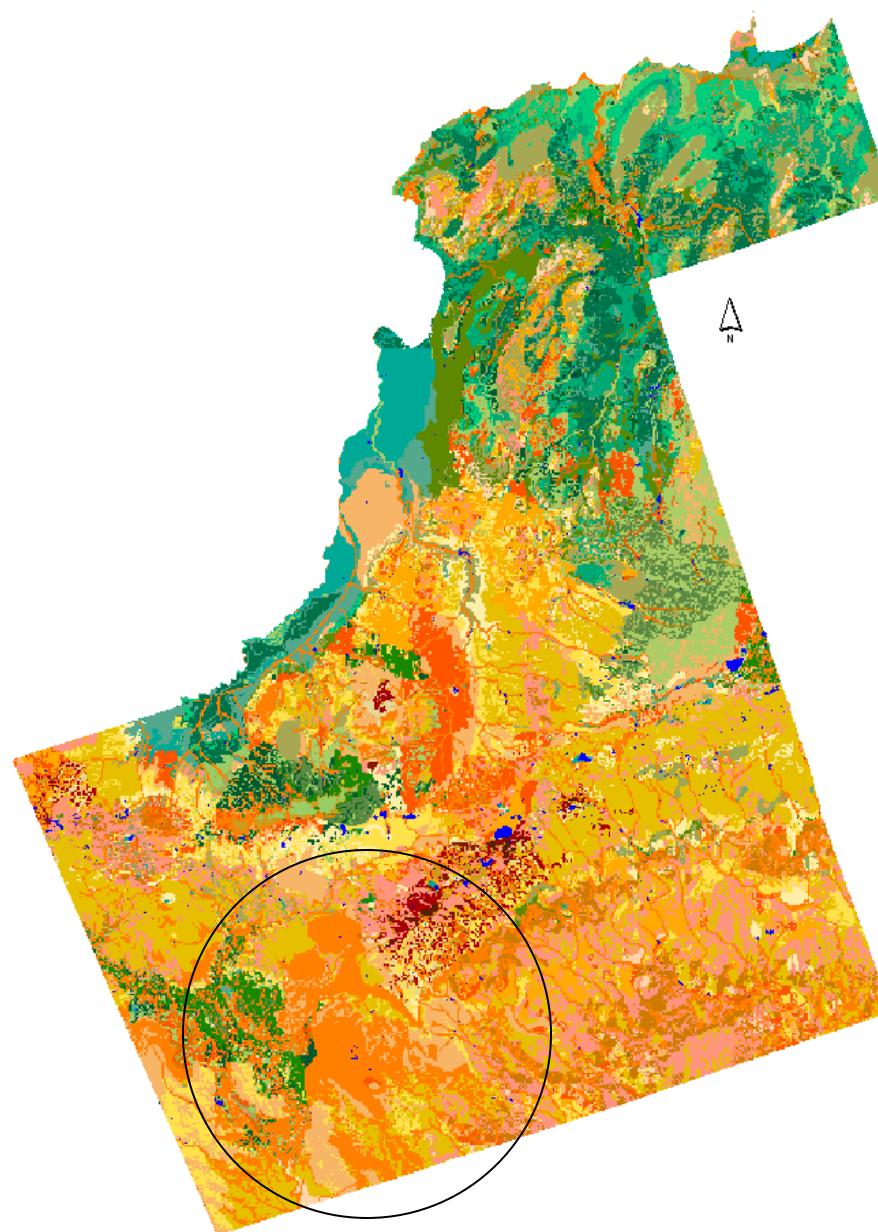- tamarack
- tamarack-spruce
- lakes

0   5   10   15   20   25   Kilometers

Modified ELC

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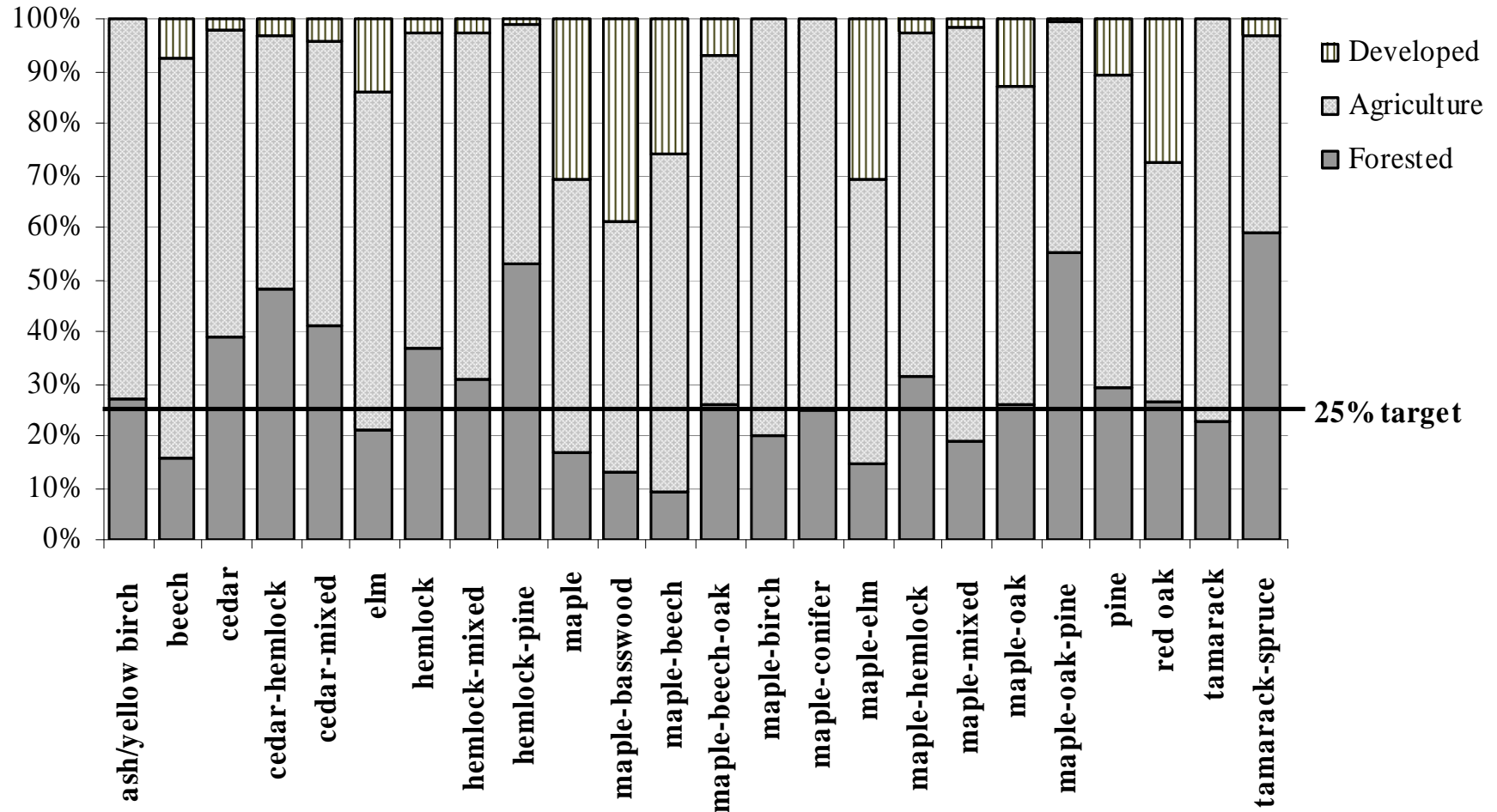
Species assemblages level 2

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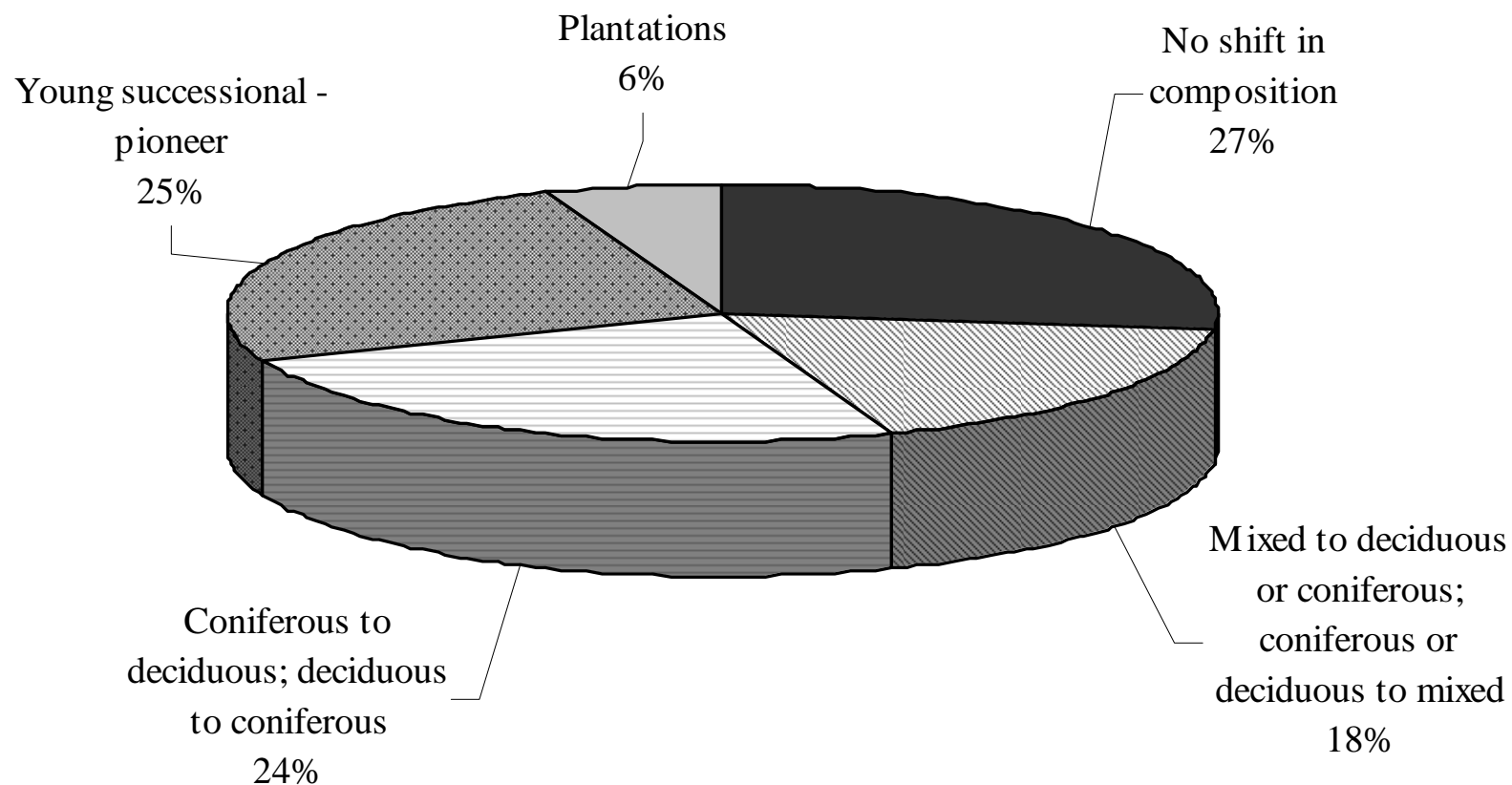
Gap analysis
target - 25% forest cover

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Contingency graph showing what percentage of each of the reference ELC vegetation types is presently forested, under urban development and agriculture for the Region of York.

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Plantations
6%

Young successional - pioneer
25%

No shift in composition
27%

Mixed to deciduous or coniferous; coniferous or deciduous to mixed
18%

Coniferous to deciduous; deciduous to coniferous
24%

Naturalness levels of the existing forest cover

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Conservation directions for currently forested and agricultural lands

- Agriculture
- Developed land
- Forest protection - early successional/pioneer
- Forest protection - mid-aged to mature
- Forest protection - plantation
- Maintain forested habitat
- Restoration potential -agriculture

0   5   10   15   20   25   Kilometers
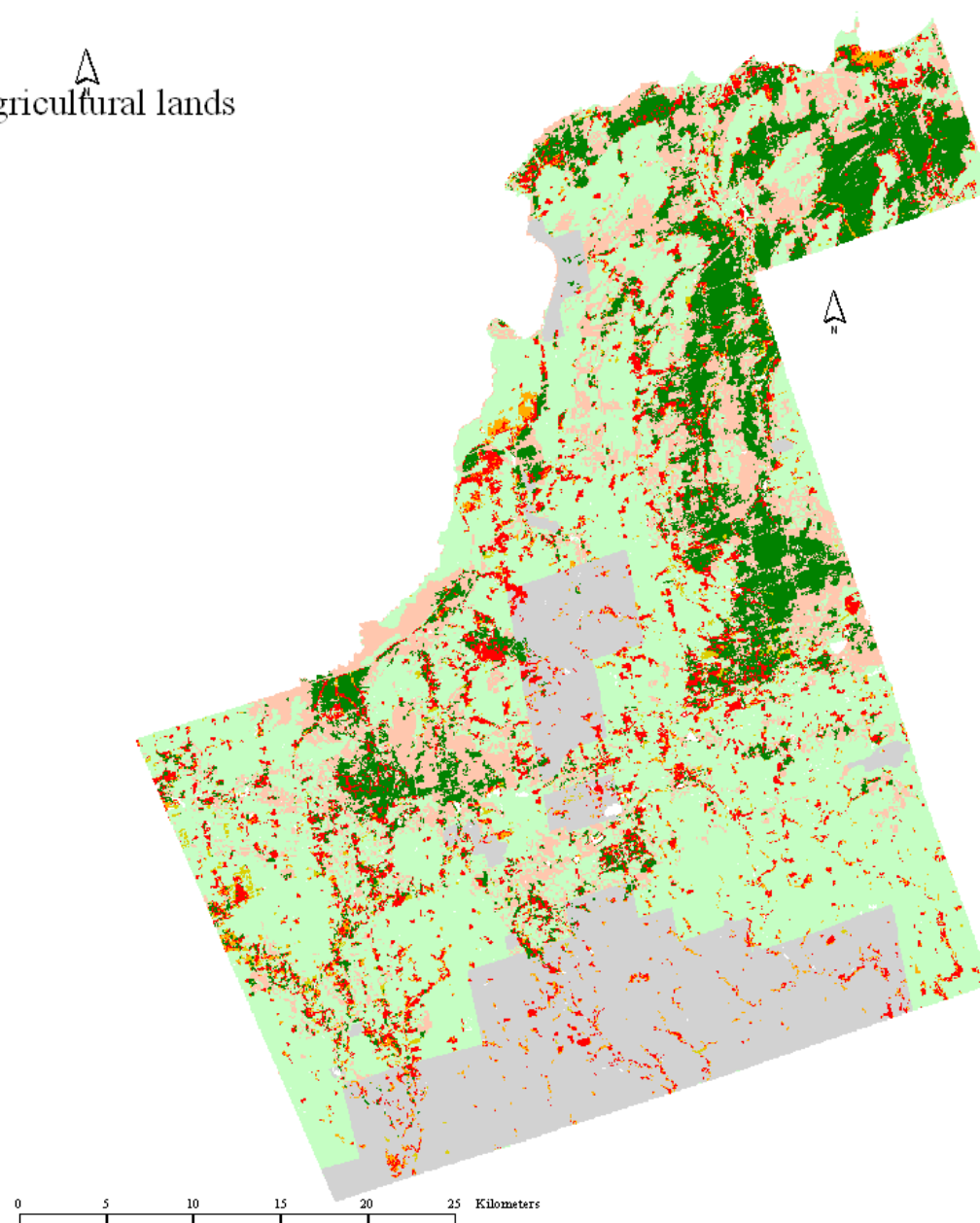
Forest conservation and restoration directions
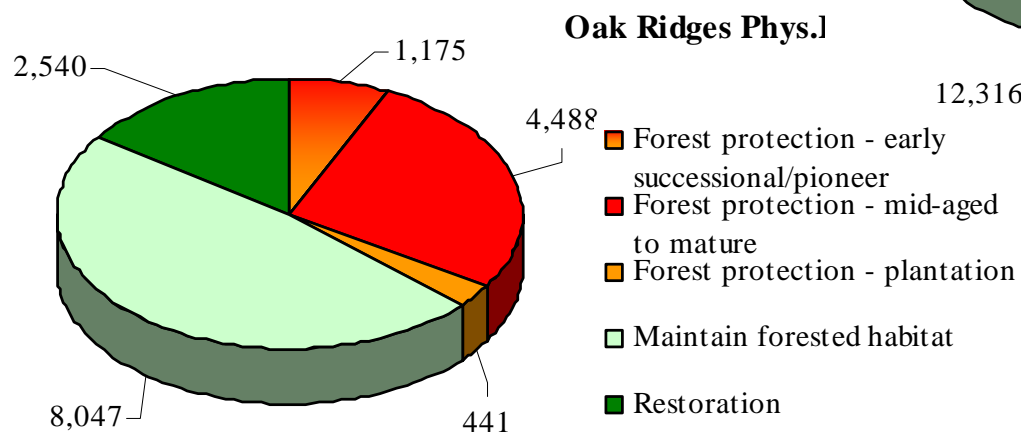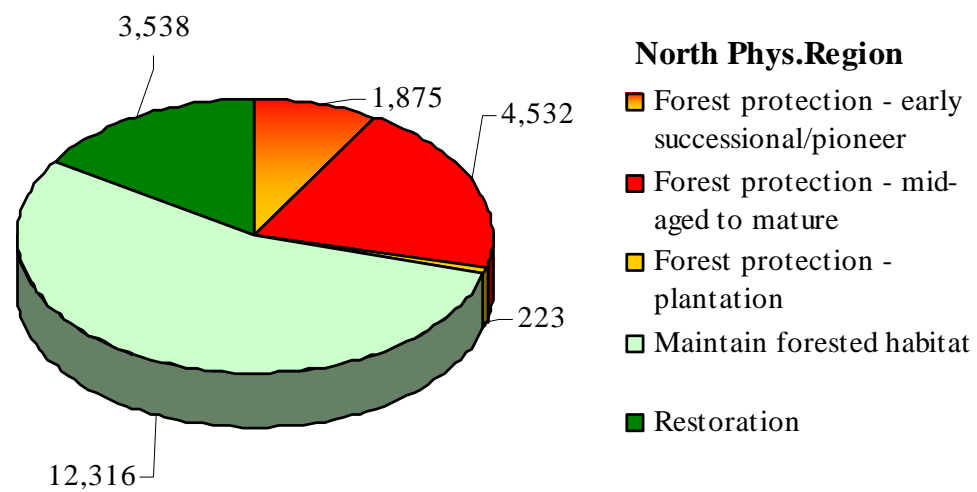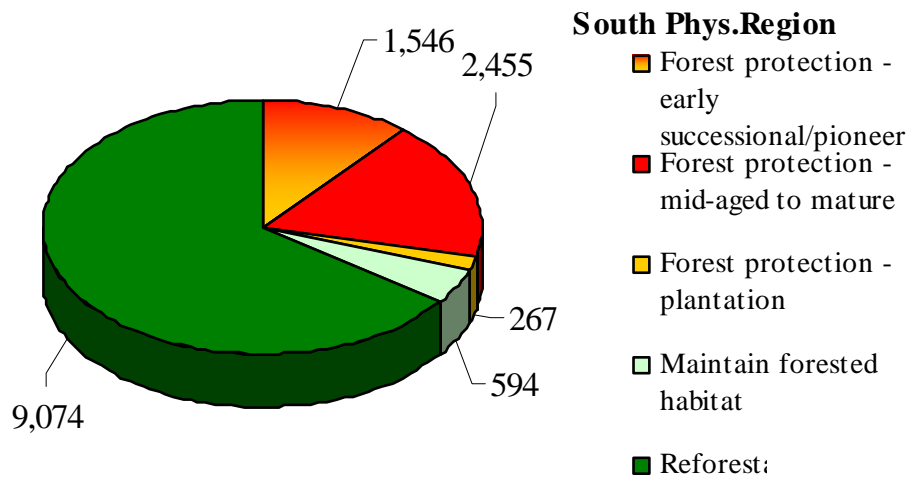
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South Phys.Region

- ☐ Forest protection - early successional/pioneer
- ☐ Forest protection - mid-aged to mature
- ☐ Forest protection - plantation
- ☐ Maintain forested habitat
- ☐ Reforest

1,546
2,455
267
594
9,074

North Phys.Region

- ☐ Forest protection - early successional/pioneer
- ☐ Forest protection - mid-aged to mature
- ☐ Forest protection - plantation
- ☐ Maintain forested habitat
- ☐ Restoration

3,538
1,875
4,532
223
12,316

Oak Ridges Phys.I

- ☐ Forest protection - early successional/pioneer
- ☐ Forest protection - mid-aged to mature
- ☐ Forest protection - plantation
- ☐ Maintain forested habitat
- ☐ Restoration

2,540
1,175
4,488
441
8,047

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Significant or not?
More significant? Less significant?

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