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CWS-ON Biodiversity Atlas

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Canadian Wildlife Service - Ontario
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CWS-ON Biodiversity Atlas

- **What** is the CWS-ON "Biodiversity Atlas"?
  - *Geospatial representation of the CWS biodiversity portfolio: species richness, migratory bird densities, habitat extent & quality;*
  - *Geospatial representation of HMHE guidelines*

- **Where** is the Atlas focused?
  - *Ontario portions of the Boreal Hardwood Transition and Mixedwood Plains ecozone (BCR 12 and 13).*

- **Why** was the Atlas created?
  - *To better see and understand the distribution of species and habitats, share information with others, and help facilitate the conservation of important natural places;*
  - ***To provide guidance on places of high biodiversity value**.*

CWS-ON Biodiversity Portfolio

- Responsible for wildlife matters related to species of federal concern:
  - Species listed under federal legislation (migratory birds, SAR) (**species**);
  - National Wildlife Areas and Migratory Bird Sanctuaries (**places**);
  - Wetlands under the *Federal Policy on Wetland Conservation* (**habitats**);
  - Ecological Gifts; and
  - *others…*

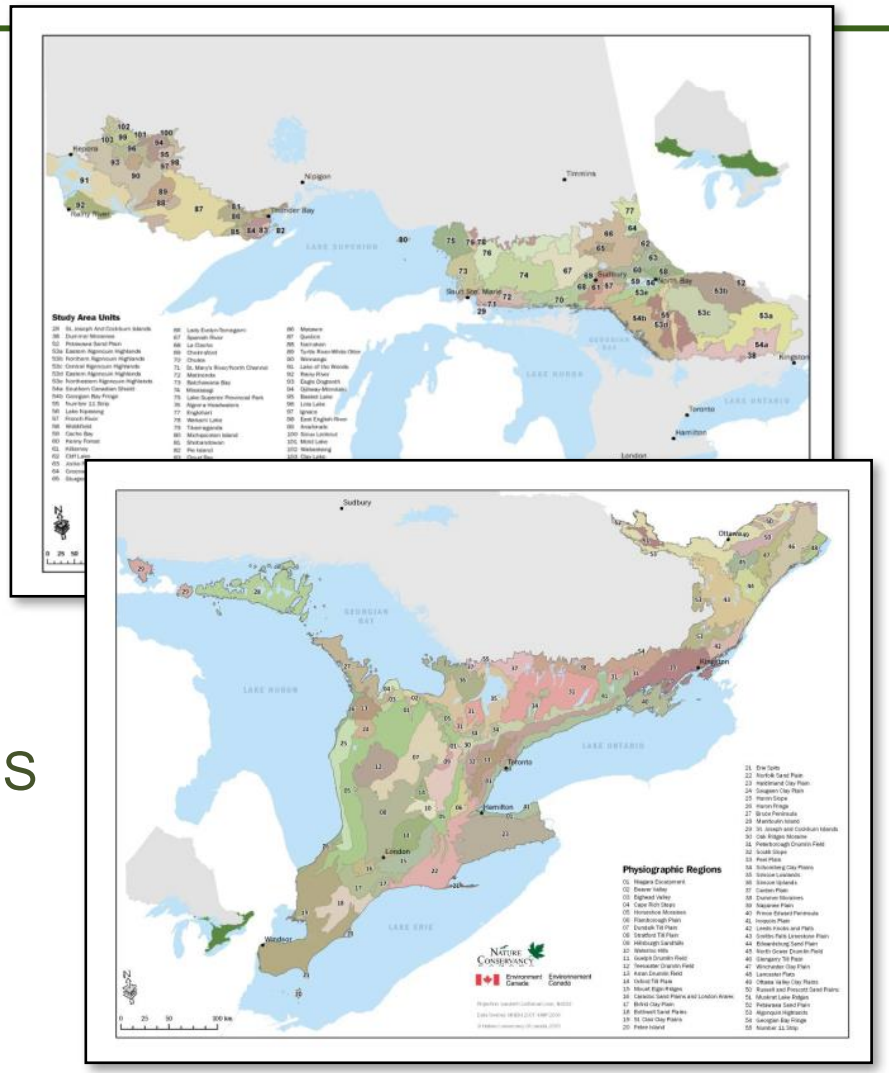
  CWS-ON Biodiversity Portfolio

- Little jurisdiction over non-Federal land – how to deliver on our mandate?

- ***By providing guidance on amounts and types of habitats, and places of interest…***

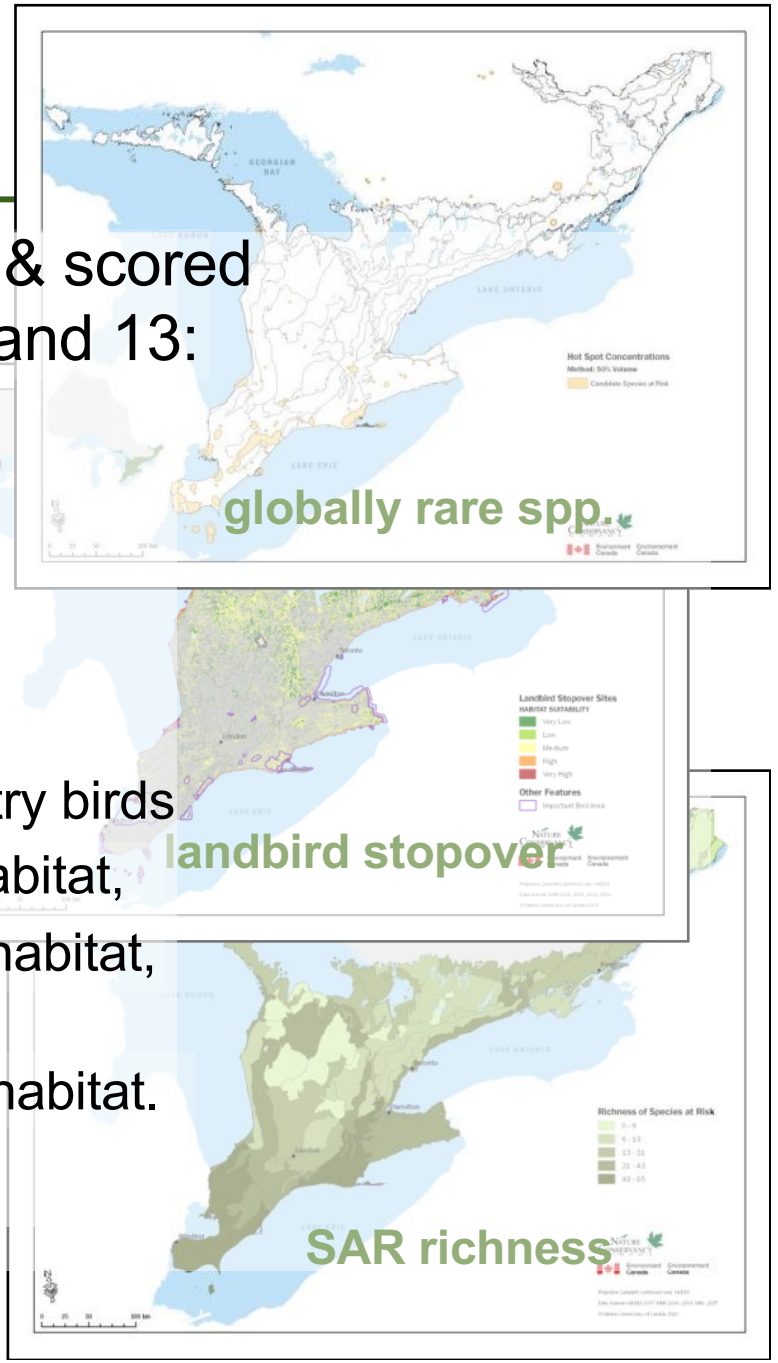
Assessing the landscape

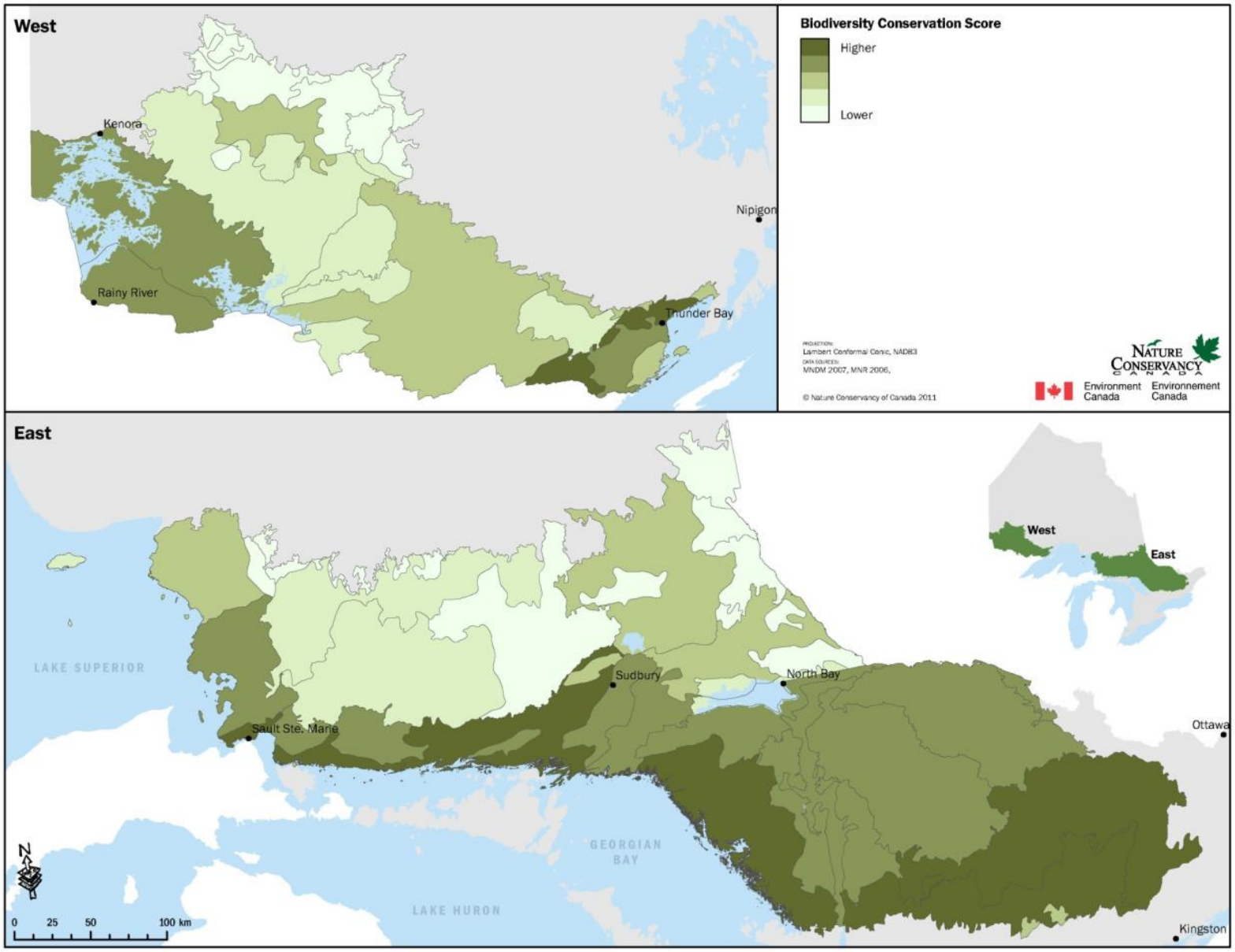
- Geographically represent species and habitats within the **CWS biodiversity portfolio** – such as Species at Risk (SAR), migratory birds, wetlands and globally rare species.
- **Coarse, medium and fine** resolution analyses
- **Coarse analysis:** MWP (BCR 13) subdivided into 53 ecoregions; SBS (BCR 12) was subdivided into 60 ecoregions.



Assessment - Coarse

- 14 biodiversity elements mapped & scored for each ecoregion w/n BCRs 12 and 13:
  - SAR richness, count, irreplacability
  - globally rare species richness,
  - coastal wetlands,
  - colonial waterbird colonies,
  - Relative density by BCR bird guilds
  - Relative density forest & open country birds
  - area of suitable landbird stopover habitat,
  - area of suitable shorebird stopover habitat, and;
  - area of suitable waterfowl stopover habitat.





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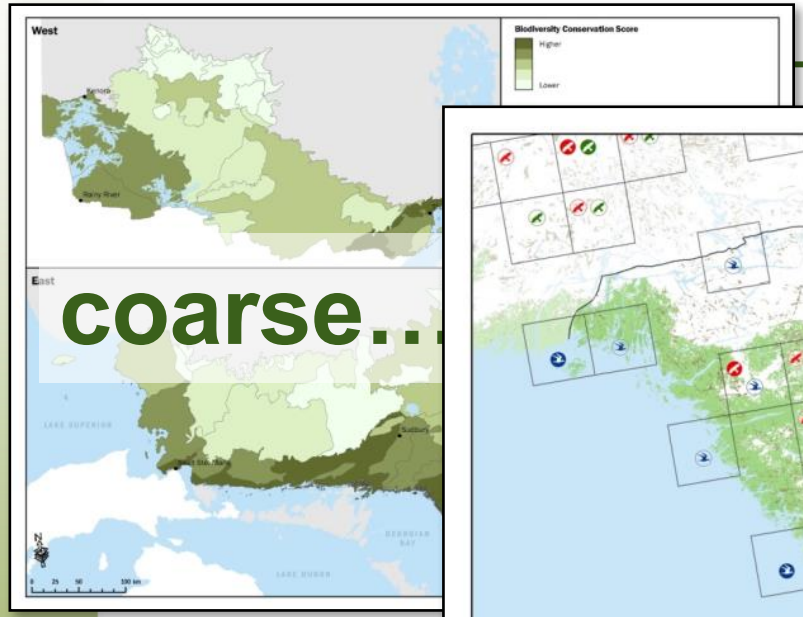
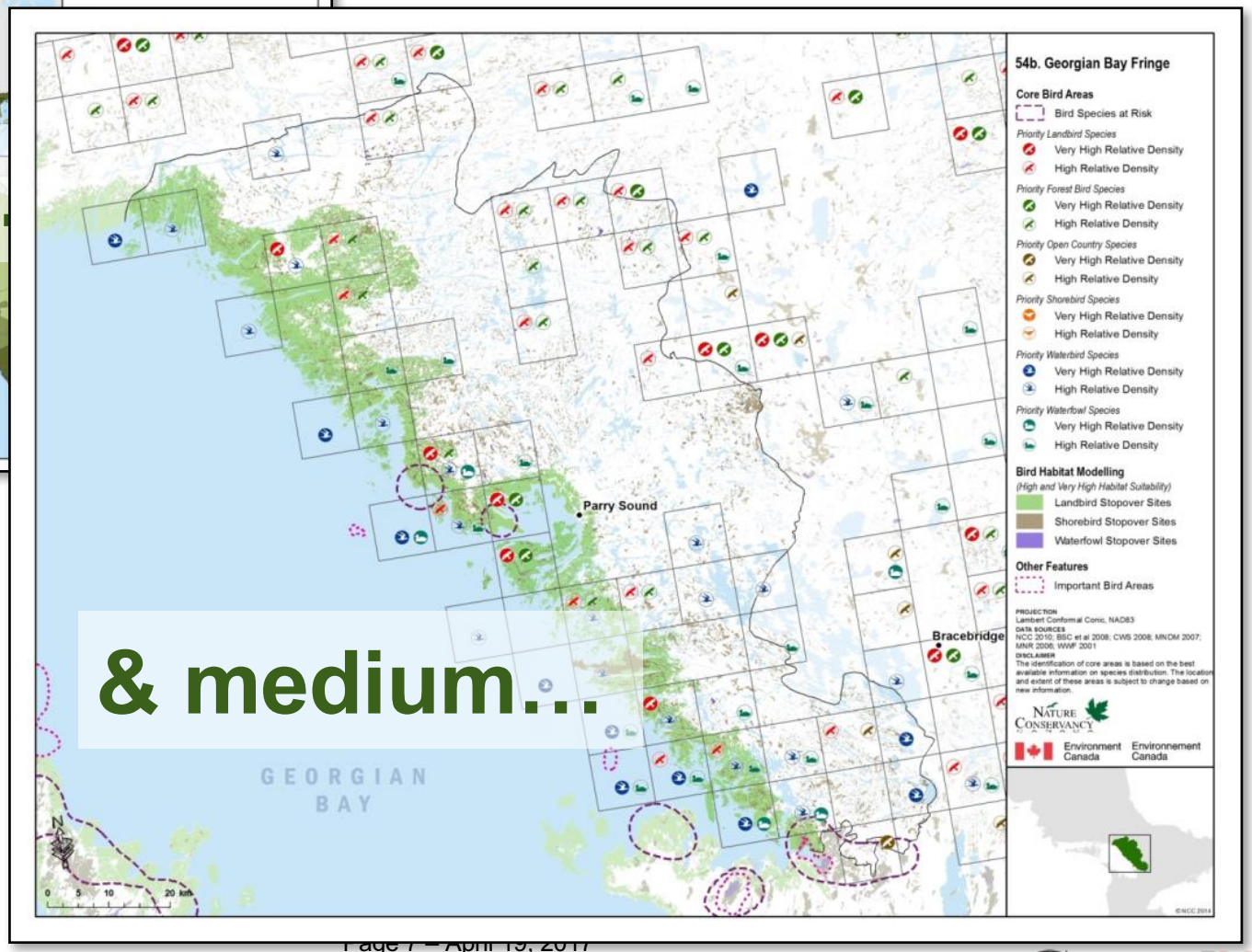
Coarse & Medium analysis resolutions…





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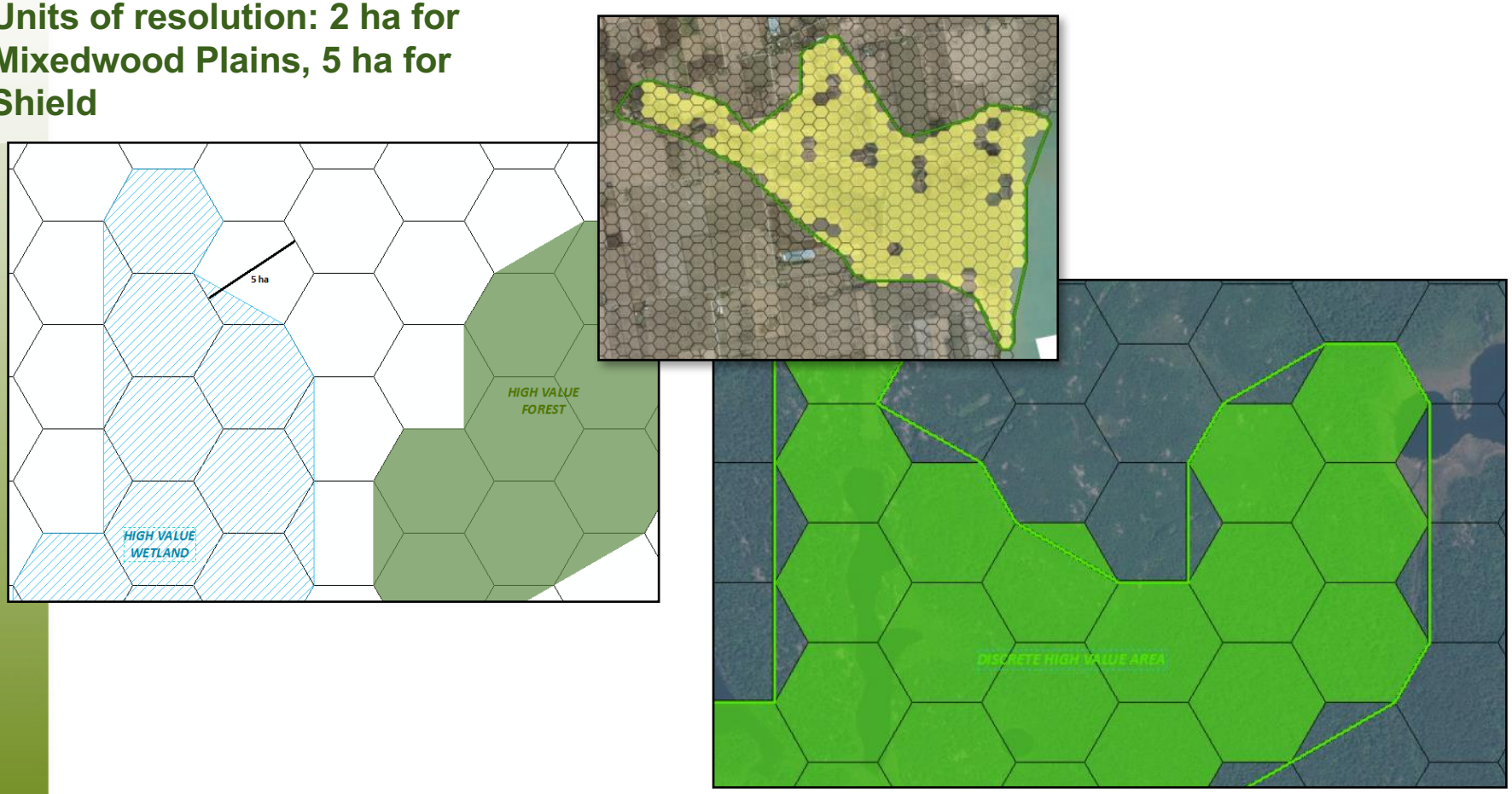
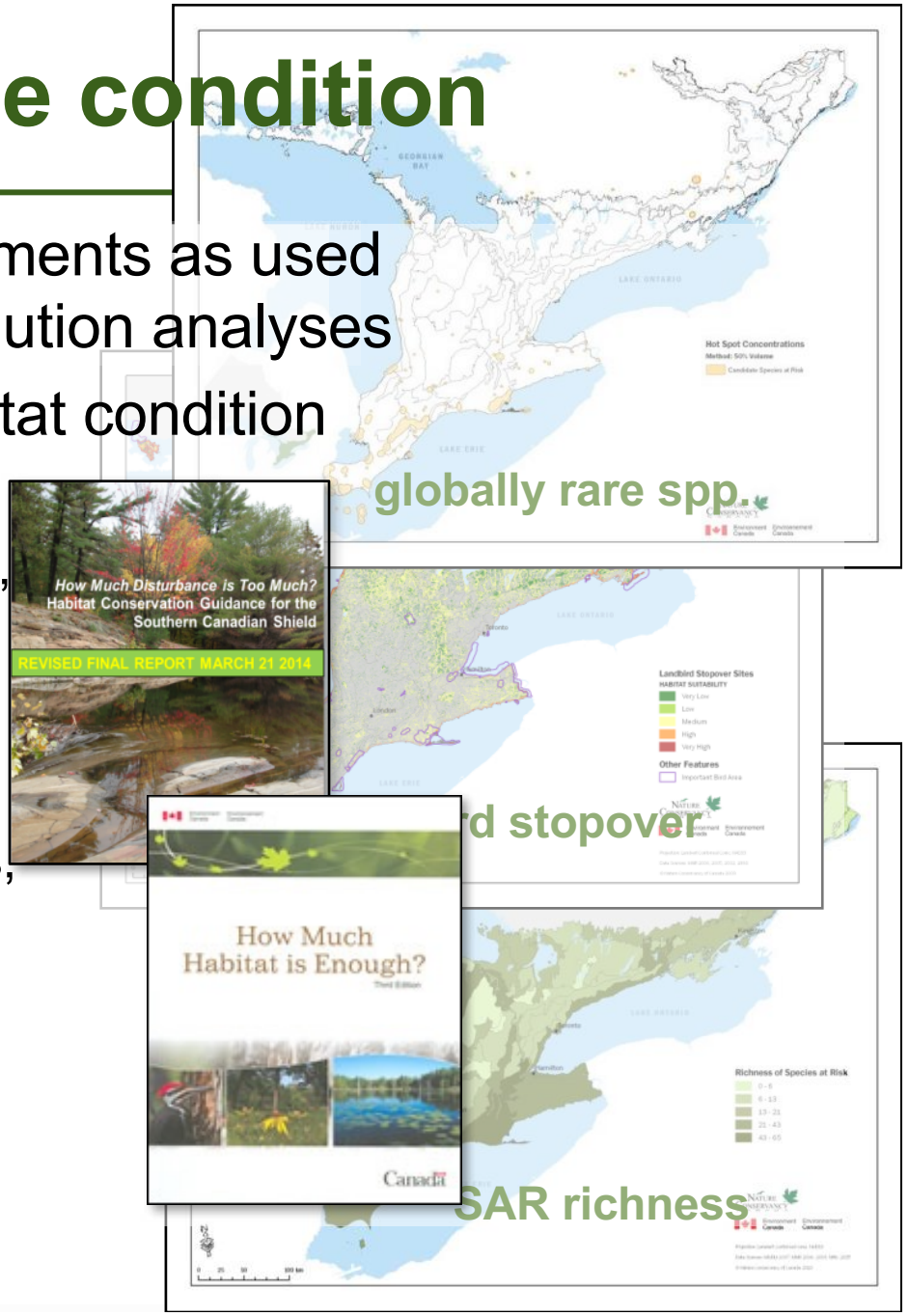
… Fine resolution…

Units of resolution: 2 ha for Mixedwood Plains, 5 ha for Shield



…added landscape condition

- Retained12 biodiversity elements as used in coarse and medium resolution analyses
- Added 20 landscape & habitat condition criteria, such as;
  - wetland cover per watershed,
  - riparian natural cover,
  - forest cover per watershed,
  - representation/diversity,
  - Size of open country patches,
  - forest connectivity,
  - old growth/interior forest,
  - Wetland proximity,
  - etc….



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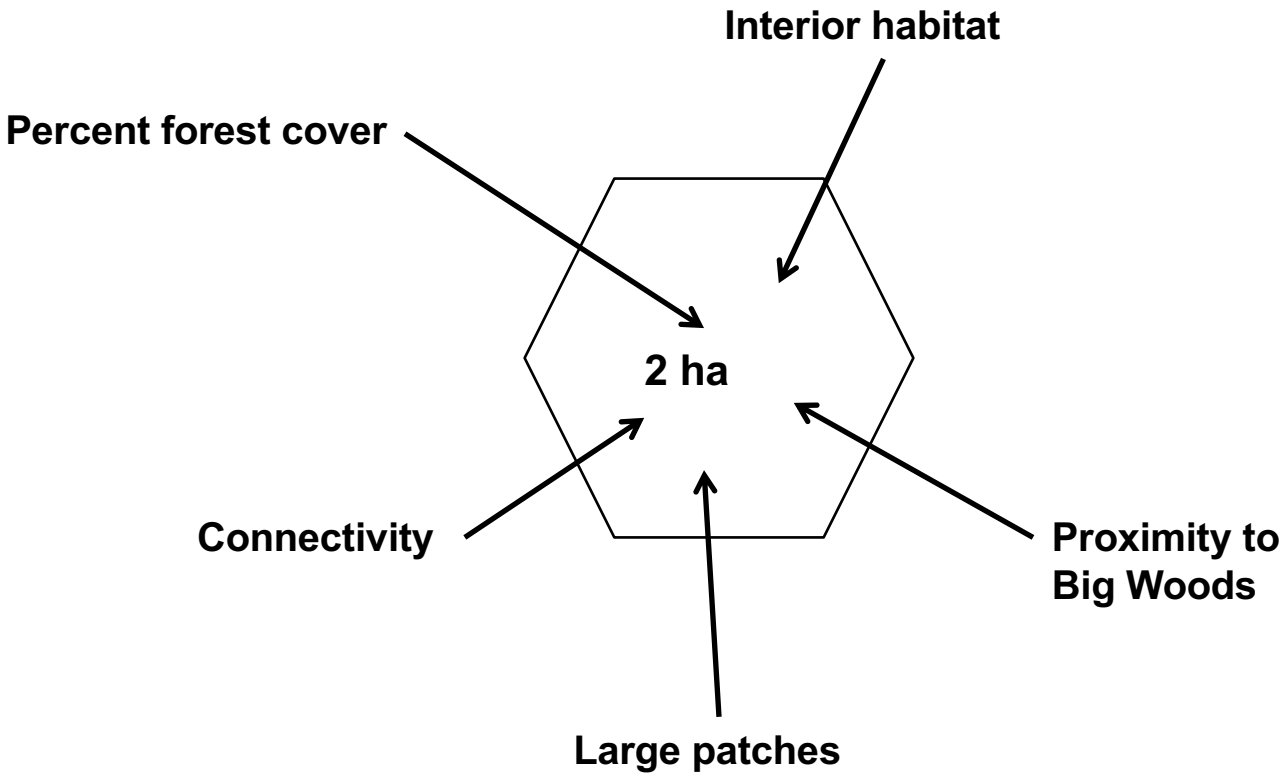
Basically…

- We can map scores for about 30 different things at a resolution from 5ha to the entire ecozone
  - Where are the big forest patches? Where are watersheds with 10% wetland cover?
- We can progressively combine scores to tell you more and more about biodiversity
  - Where are the highest quality forests?
  - Which ones are important for birds? For SAR?
  - Where forests with multiple high values?
  - Where are the places with the highest value forests, wetlands and open country?
  - Where are the areas of highest overall biodiversity value?


Forest guidelines…
•Percent forest cover in the watershed
•Interior forest patches
•Big Woods
•Conectivity

FOREST HABITAT

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Sudbury
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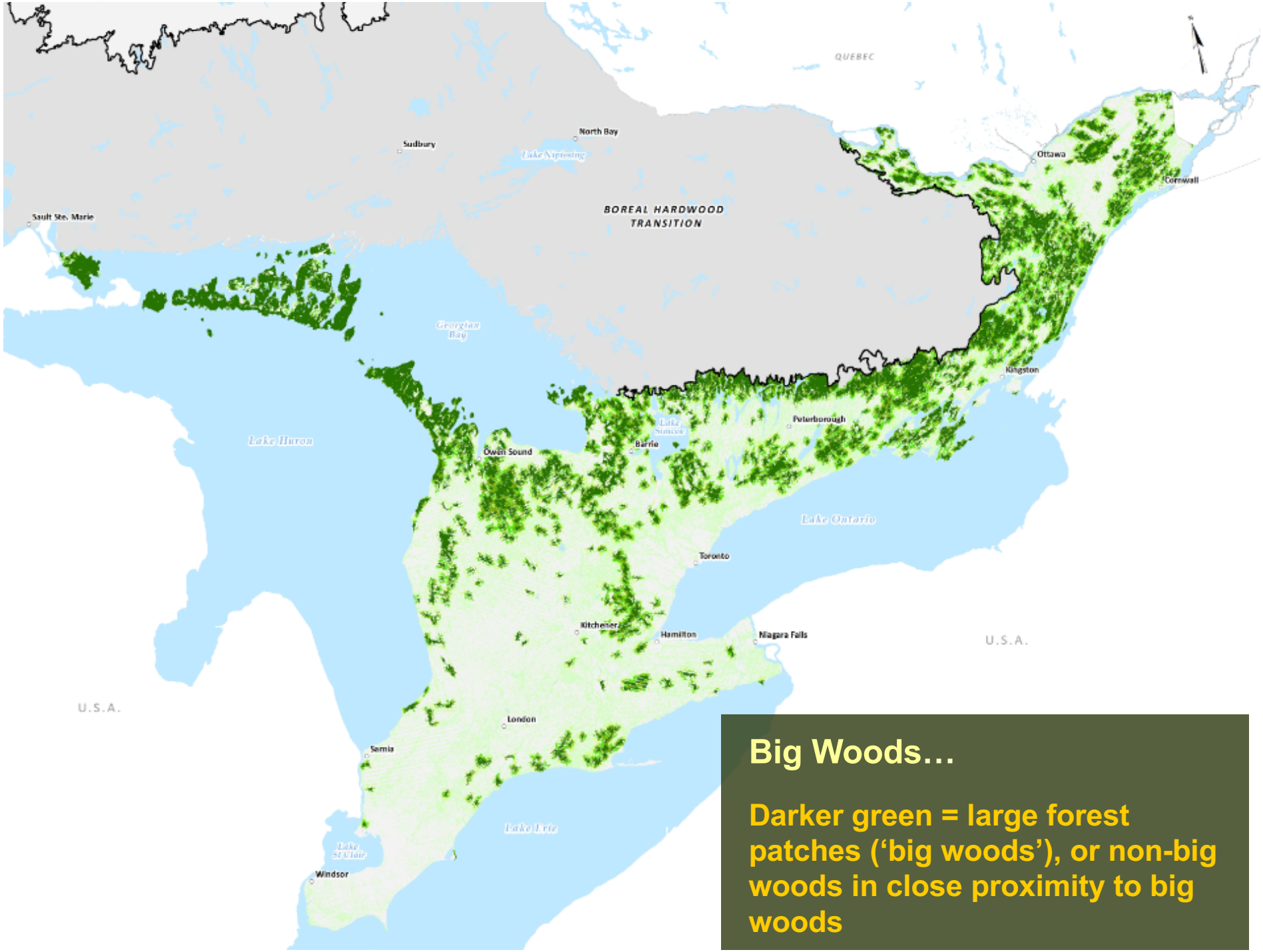
Ottawa
Cornwall
Sault Ste. Marie
BOREAL HARDWOOD
TRANSITION
Georgian Bay
Kingston
Peterborough
Lake Simcoe
Barrie
Lake Huron
Owen Sound
Lake Ontario
Toronto
Kitchener
Hamilton
Niagara Falls
U.S.A.
U.S.A.
London
Sarnia
Lake St Clair
Windsor
The forest interior and shape guidelines…
Darker green = large, interior forest patches



Big Woods…

Darker green = large forest patches (‘big woods’), or non-big woods in close proximity to big woods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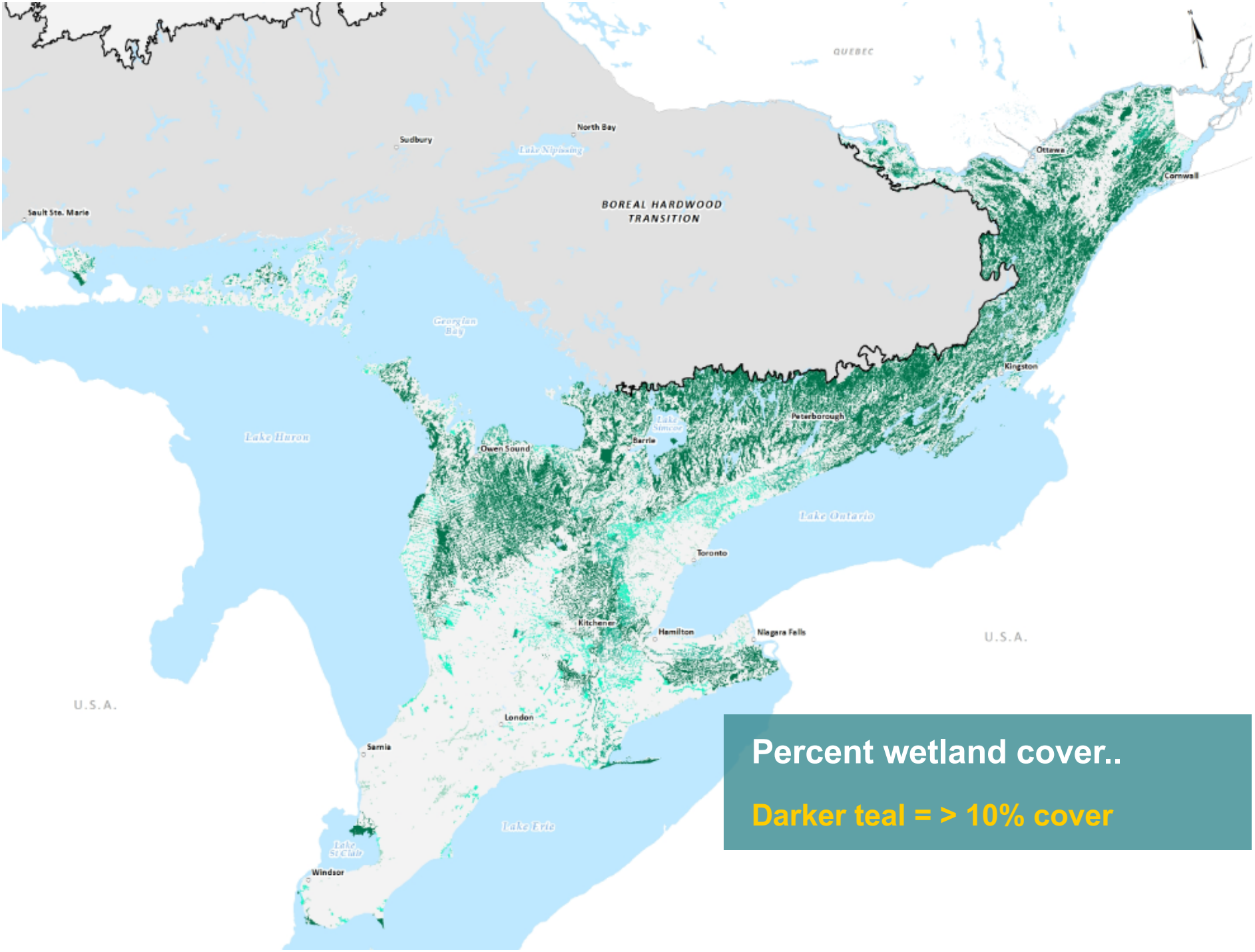
Niagara Falls
U.S.A.
U.S.A.
London
Sarnia
Lake Erie
Lake
St Clair
Windsor
Grassland Patch Size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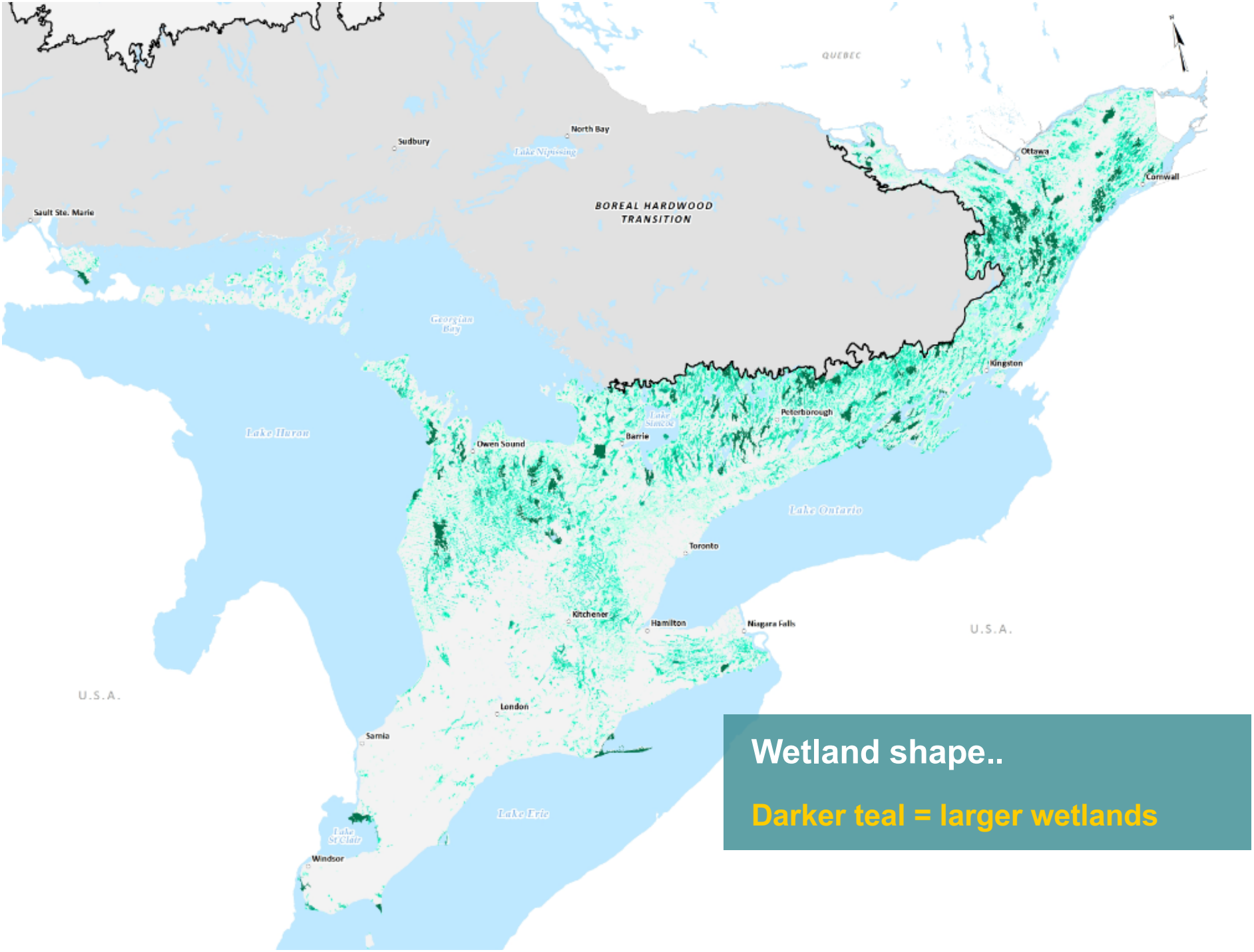
Lake Erie
Lake
St Clair
Windsor
Percent wetland cover..
Darker teal = > 10% cover

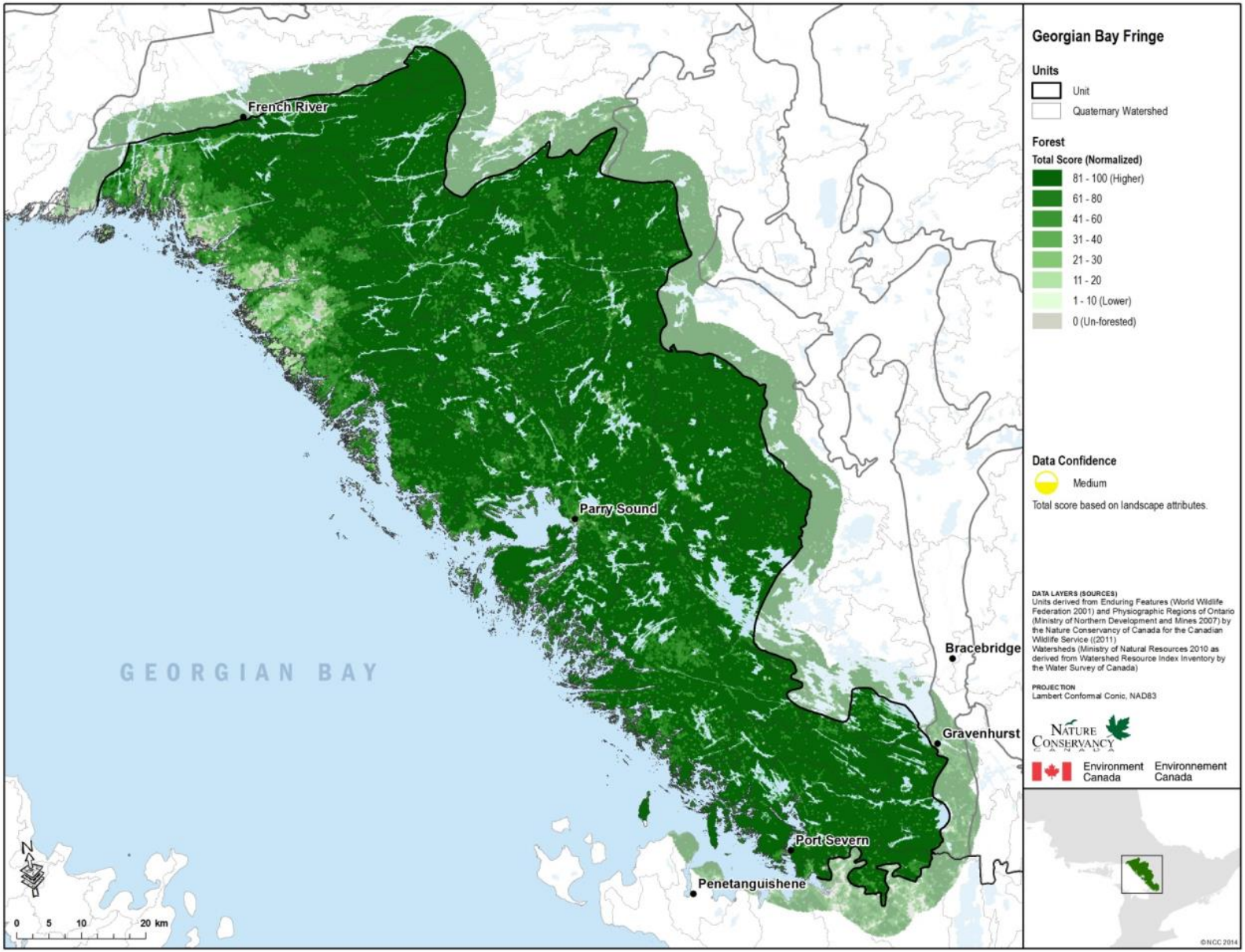


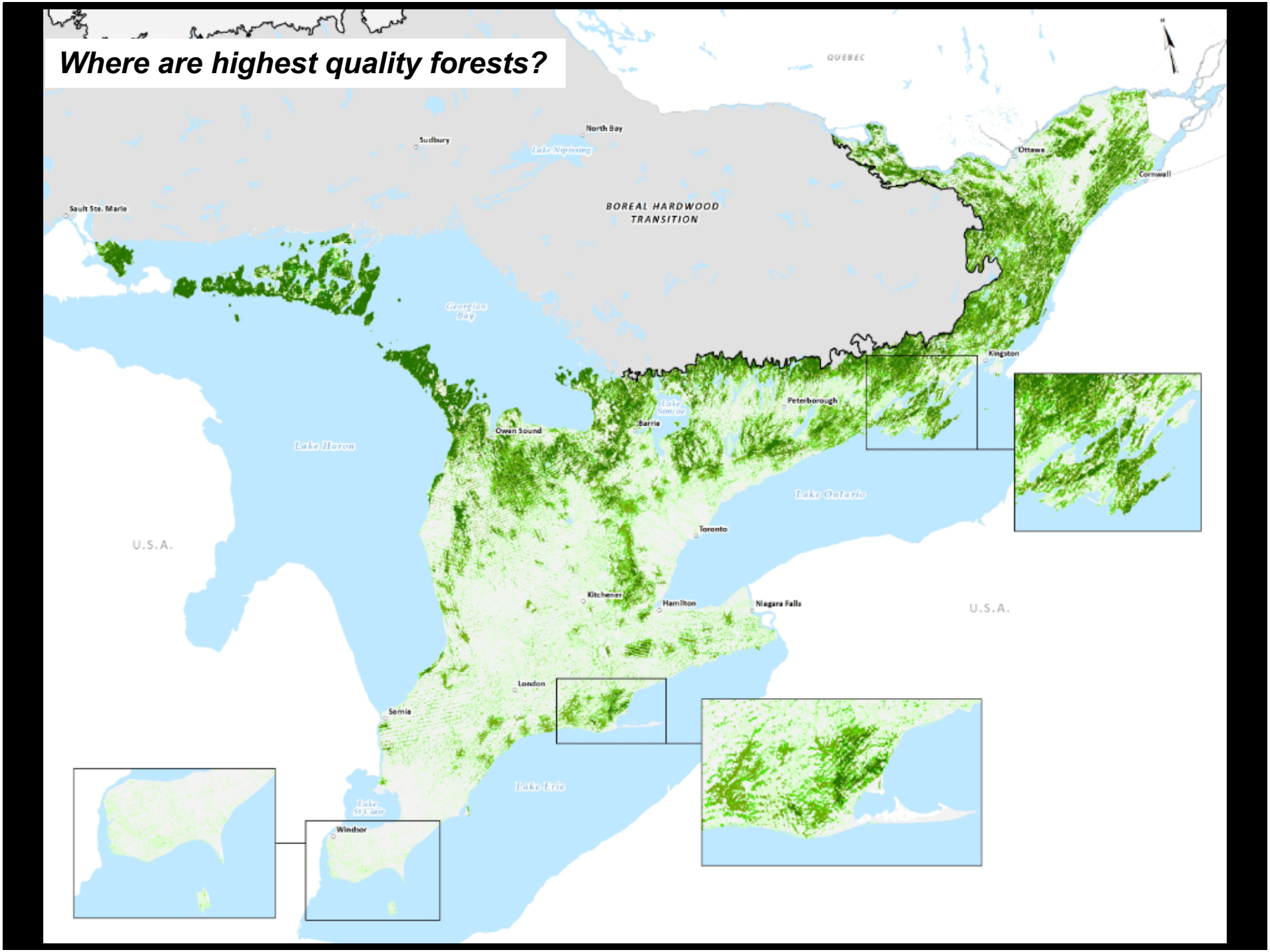
Wetland shape..

Darker teal = larger wetlands

Local Scale: Distribution of interior forest

Example: forest




Where are highest quality forests?
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Sault Ste. Marie
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TRANSITION
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Kingston
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Sarnia
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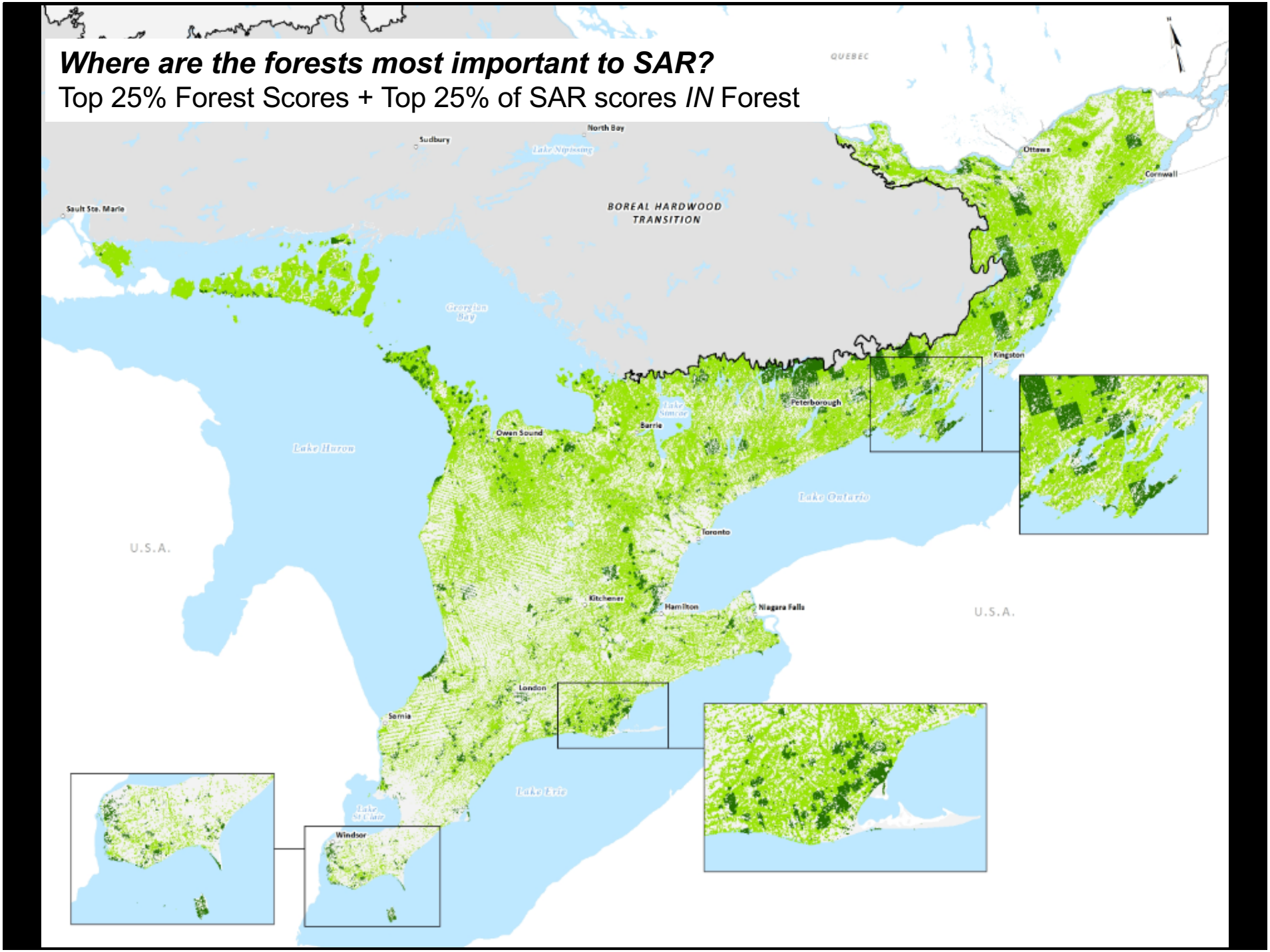
Windsor


Where are the forests most important to SAR?
Top 25% Forest Scores + Top 25% of SAR scores IN Forest
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North Bay
Sudbury
Lake Nipissing
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Cornwall
Sault Ste. Marie
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U.S.A.
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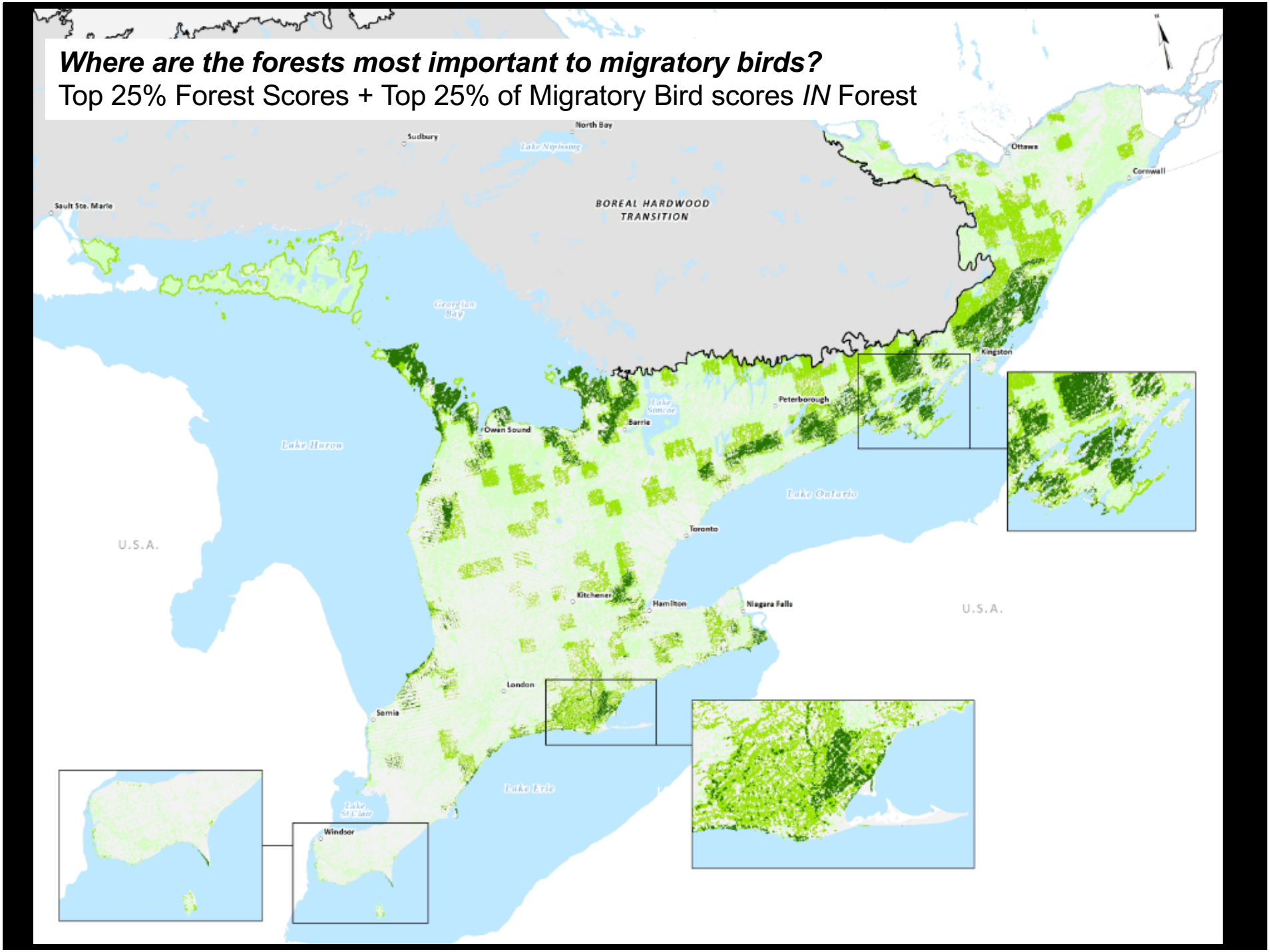
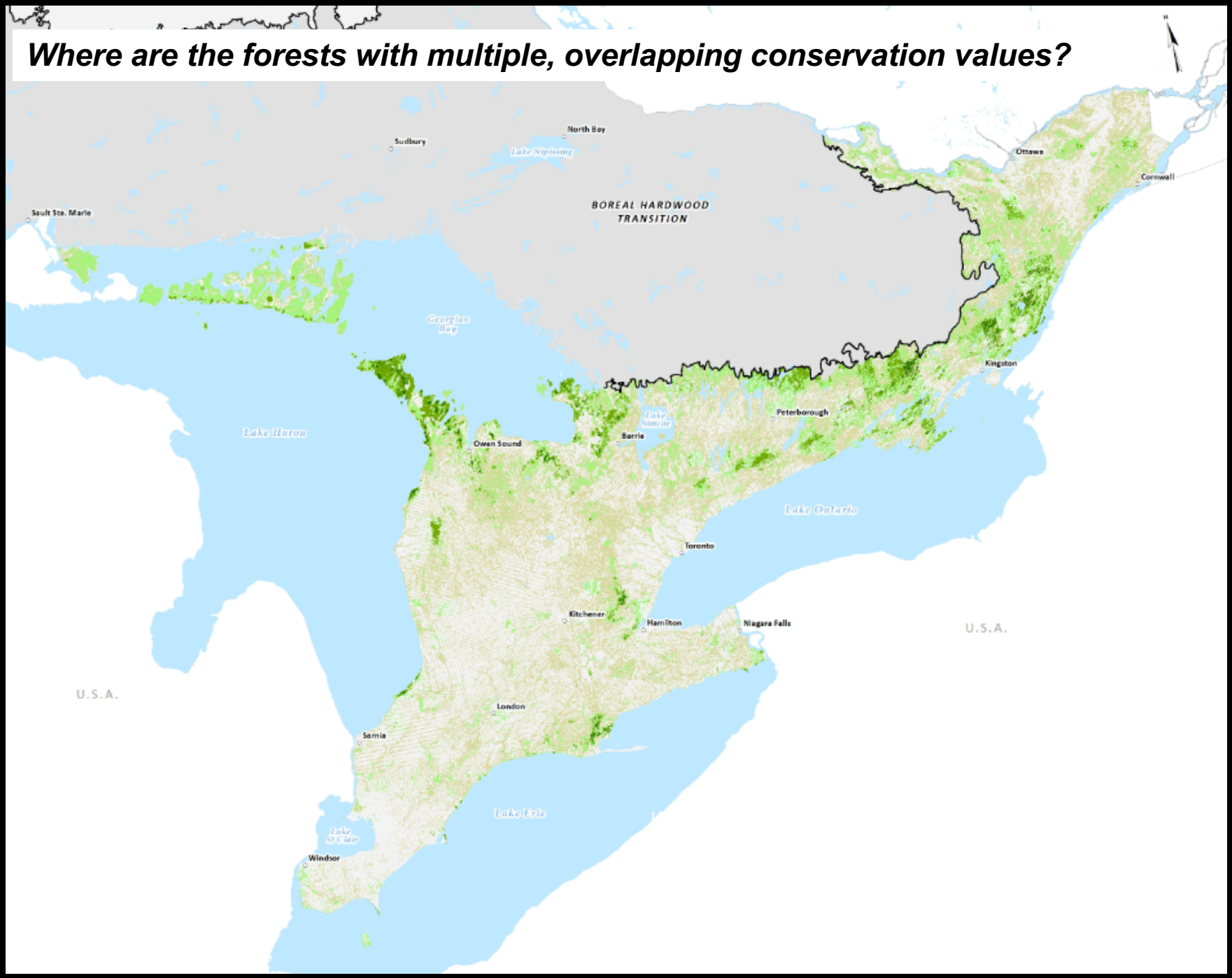
Kitchener
Hamilton
Niagara Falls
U.S.A.
London
Sarnia
Lake St Clair
Lake Erie
Windsor

Where are the forests most important to migratory birds?

Top 25% Forest Scores + Top 25% of Migratory Bird scores *IN* Forest




Where are the forests with multiple, overlapping conservation values?
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Lake Nipissing
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Cornwall
Sault Ste. Marie
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Georgian Bay
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U.S.A.
U.S.A.
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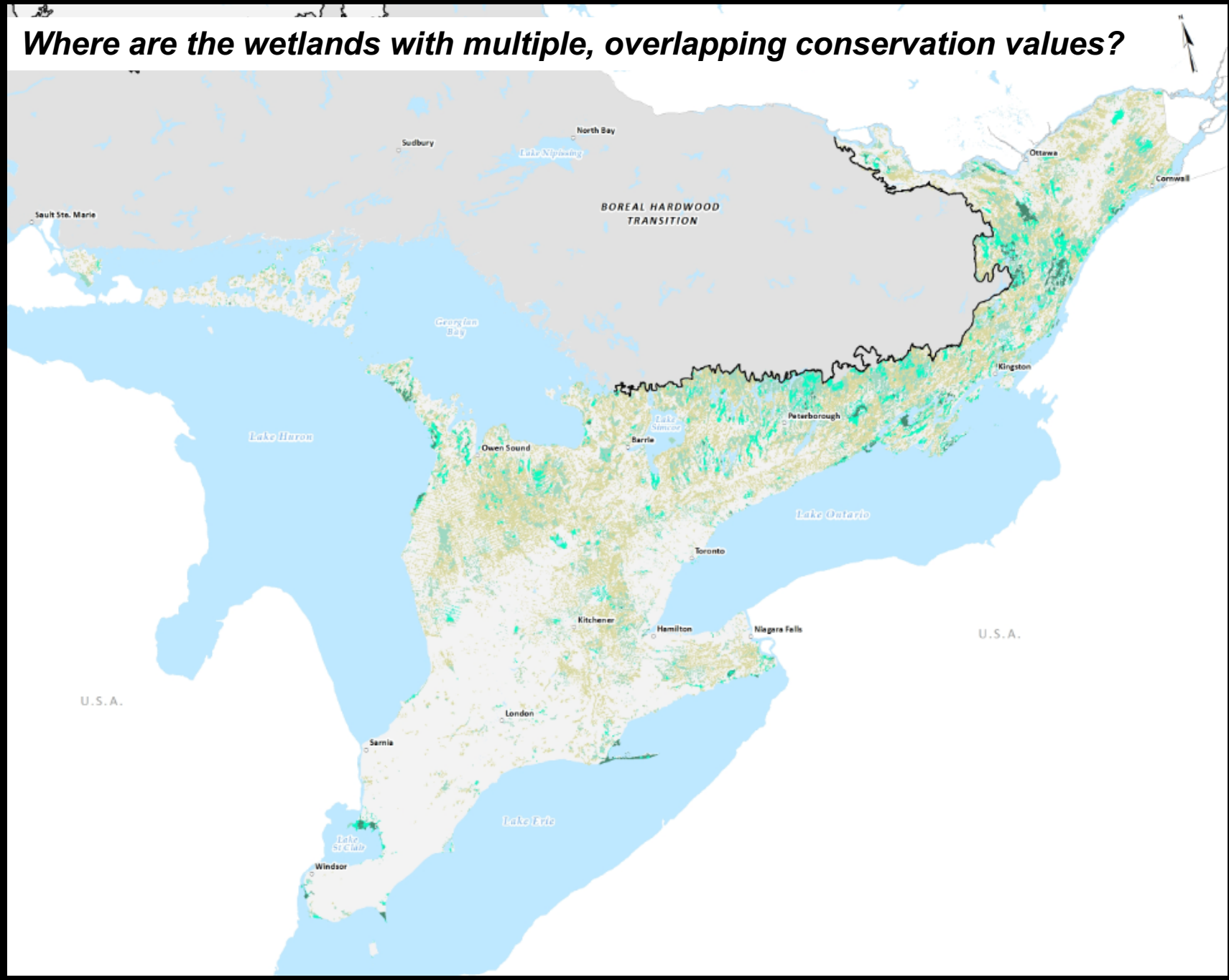
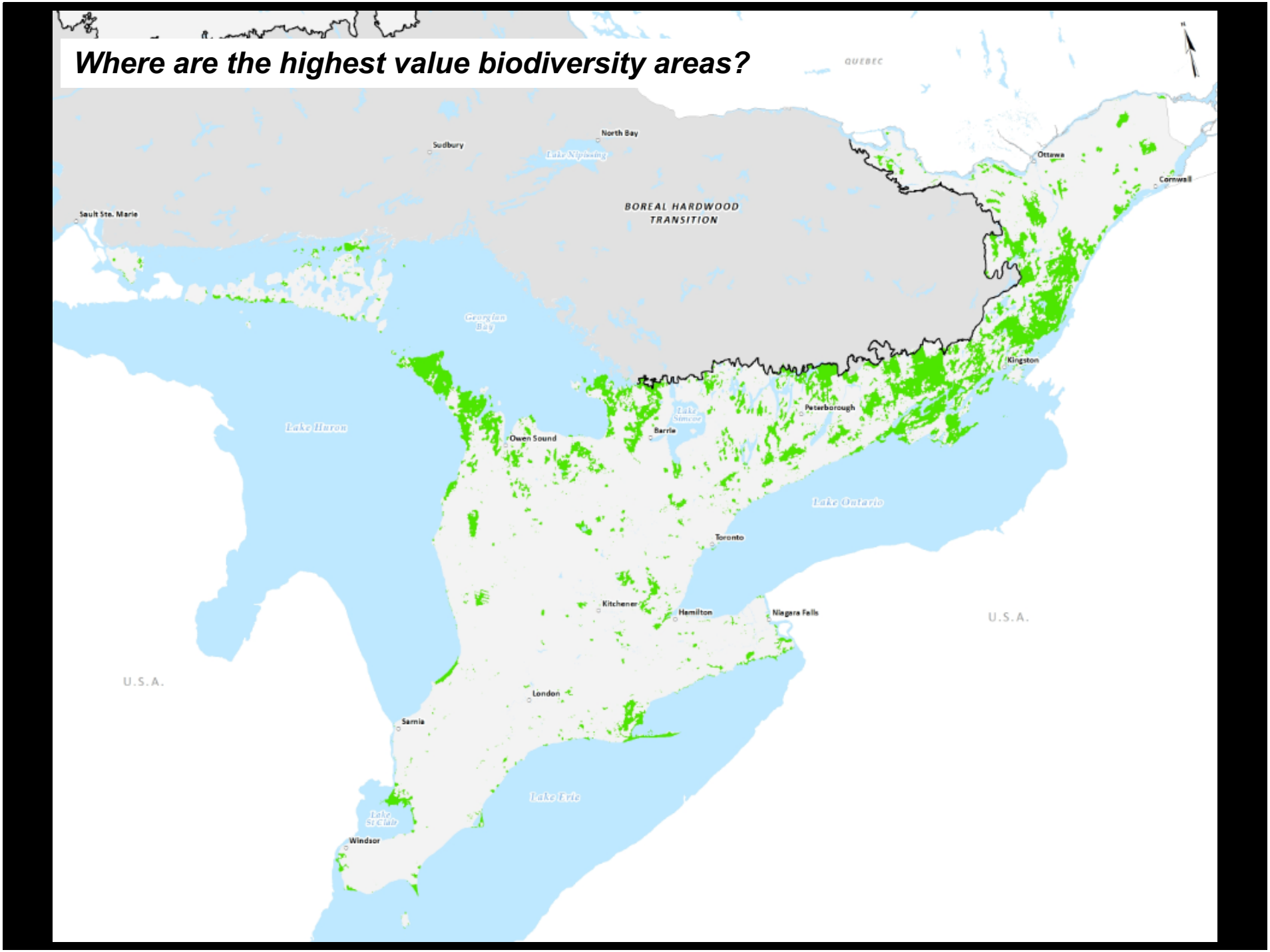
Lake Erie
Lake St. Clair
Windsor

Where are the wetlands with multiple, overlapping conservation values?



Where are the grasslands with multiple, overlapping conservation values?


Where are the highest value biodiversity areas?
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Sault Ste. Marie
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Bay
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Peterborough
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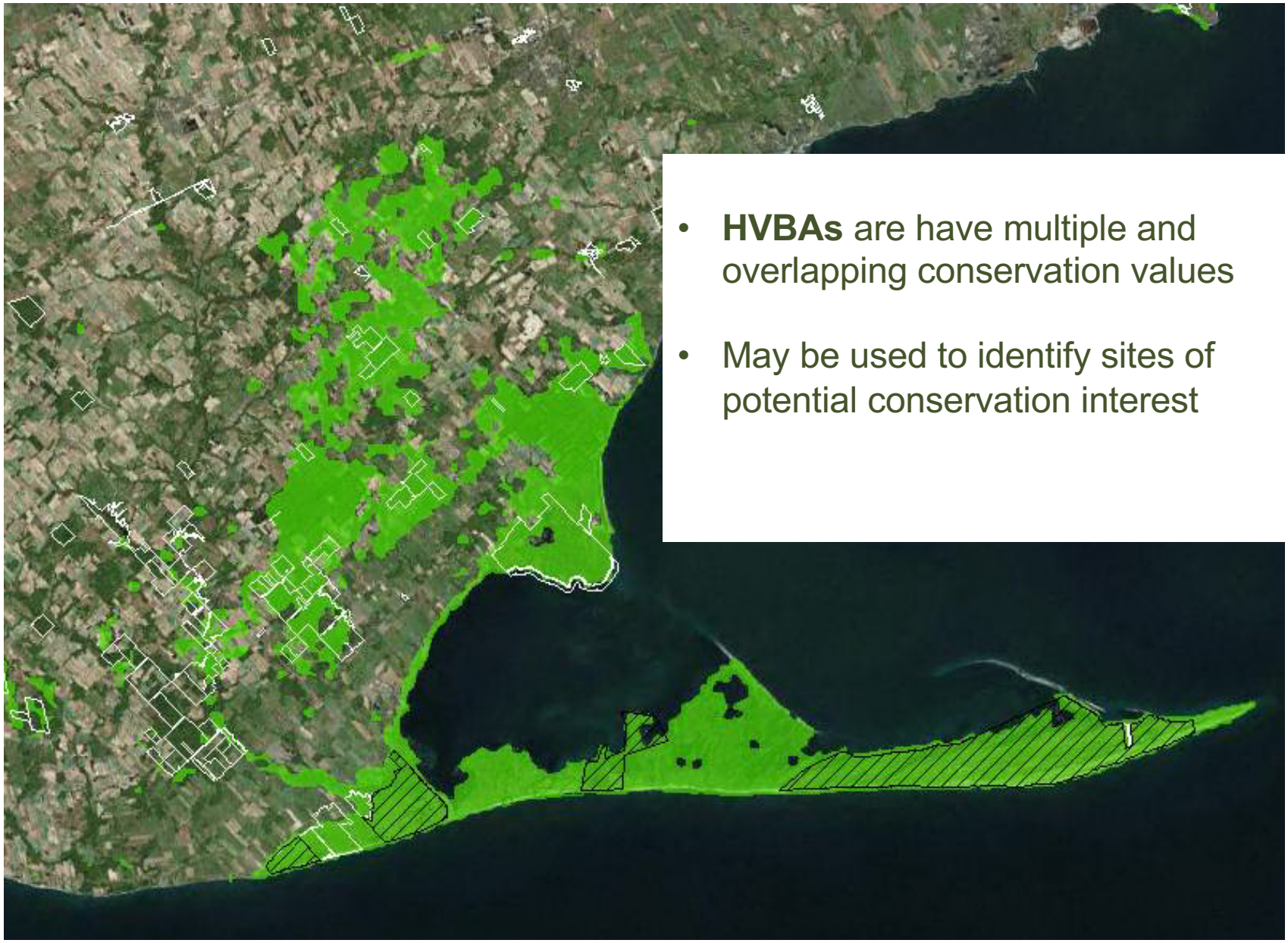
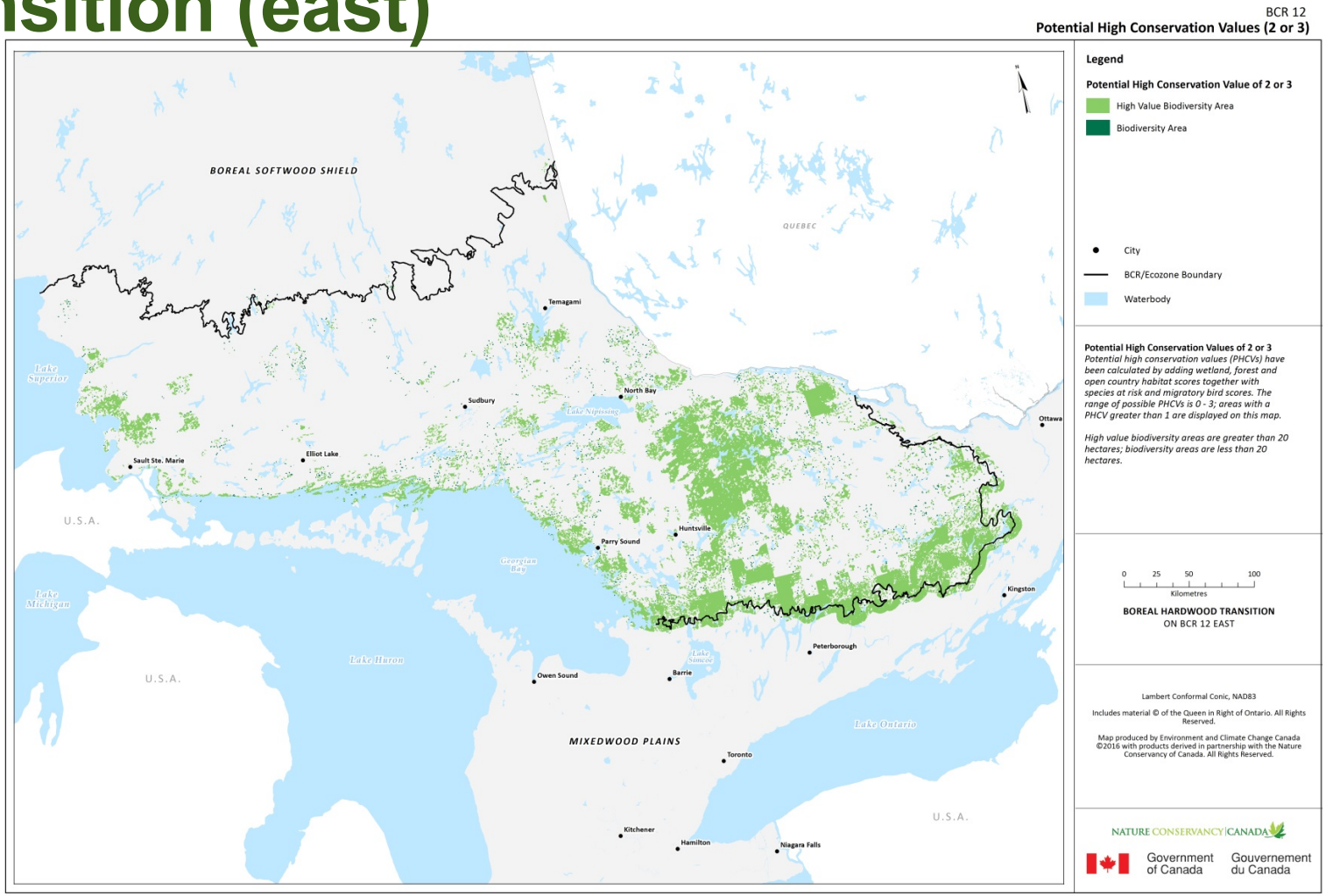
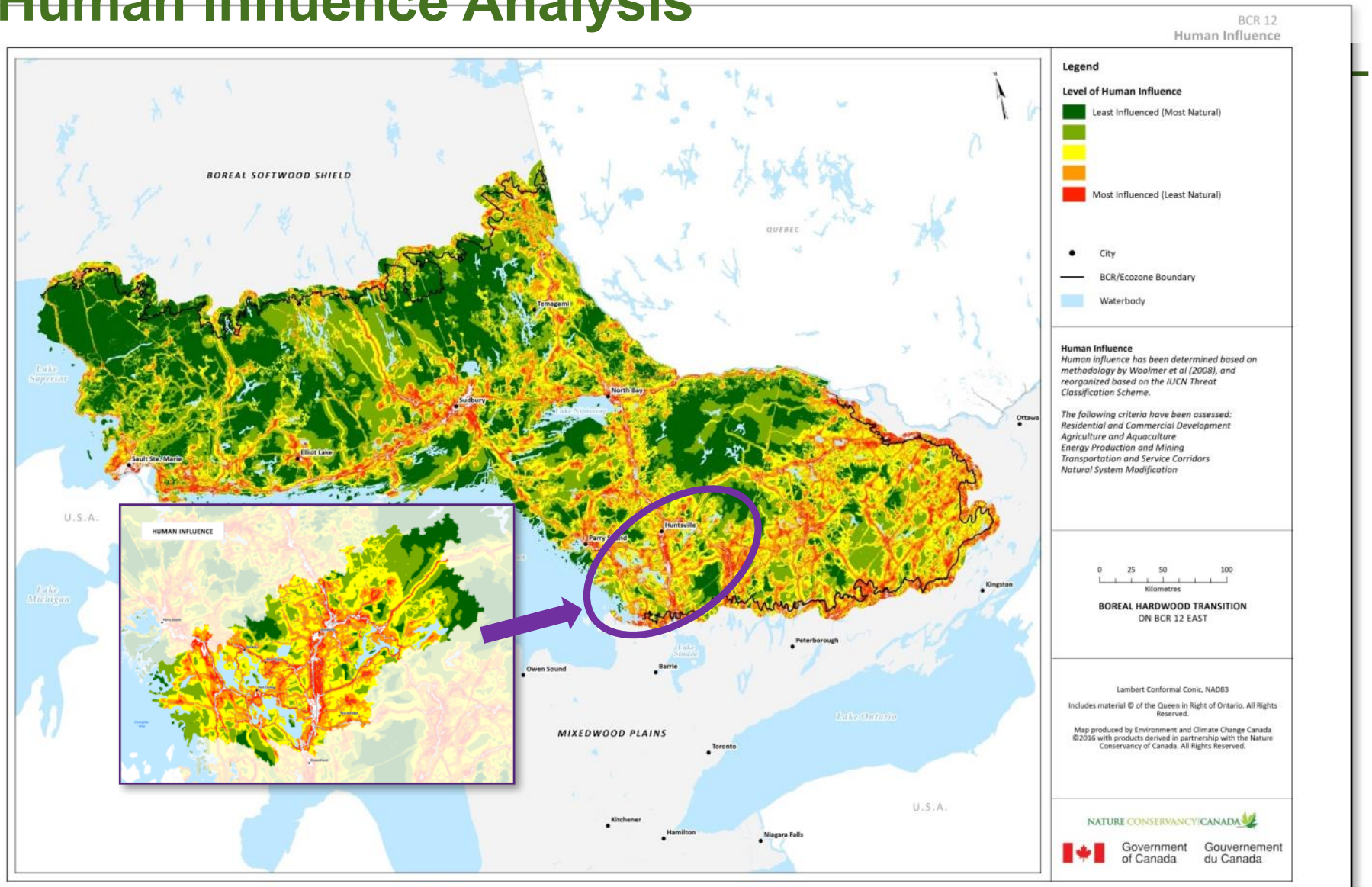


- **HVBAs** are have multiple and overlapping conservation values
- May be used to identify sites of potential conservation interest

BCR 12 (east) – Boreal hardwood Transition (east)



Creating a ~50% natural matrix for BCR 12: Human Influence Analysis



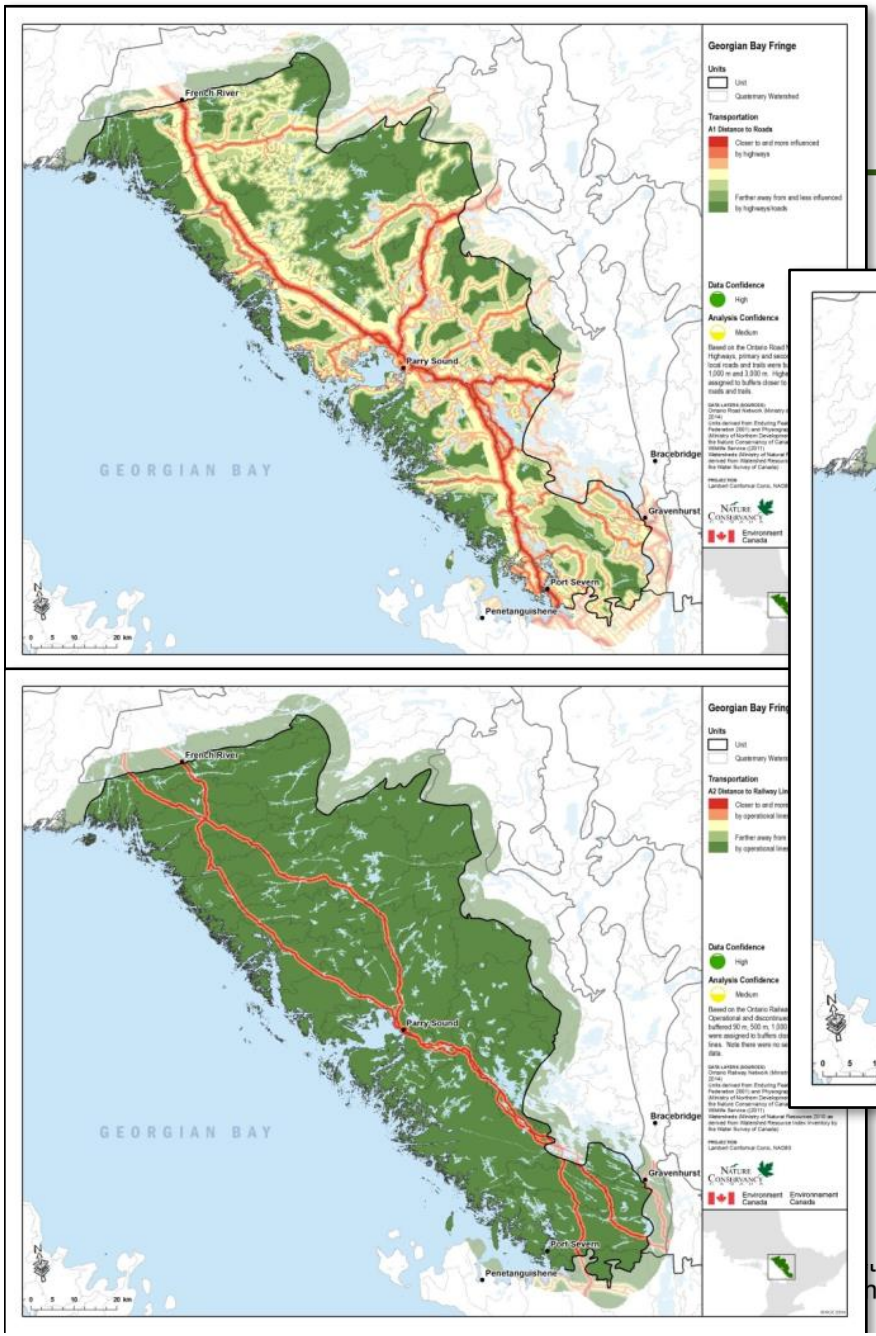
Human Influence analysis

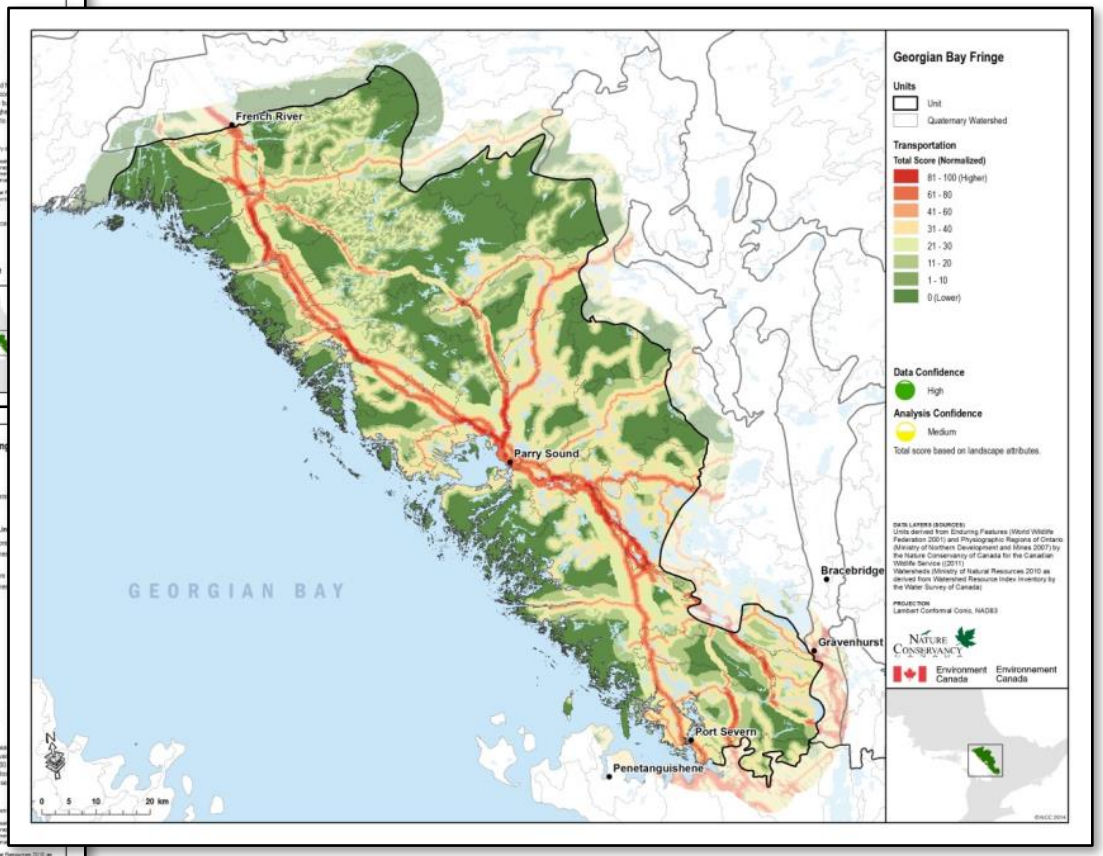
- 8 criteria covering 4 categories of disturbance were analyzed

- Categories: Transportation Infrastructure, Human Settlement, Human land Use Change, Power Infrastructure
  - Eg: Transportation Infrastructure – roads criteria

Transportation Infrastructure	**A1 Roads**	**Distance to roads**	**Expressways** **0-90 m = 10** **90-500 m = 8** **500-1000 m = 6** **1000-3000 m = 4** **Primary/Secondary Highways** **0-90 m = 8** **90-500 m = 6** **500-1000 m = 4** **1000-3000 m = 2** **Primary/Secondary Local Roads** **0-90 m = 6** **90-500 m = 4** **500-1000 m = 2** **Vehicular trails** **0-90 m = 4** **90-500 m = 2** **500-1000 m = 1**	**Buffer; assign maximum value based on road class**

Transportation infrastructure





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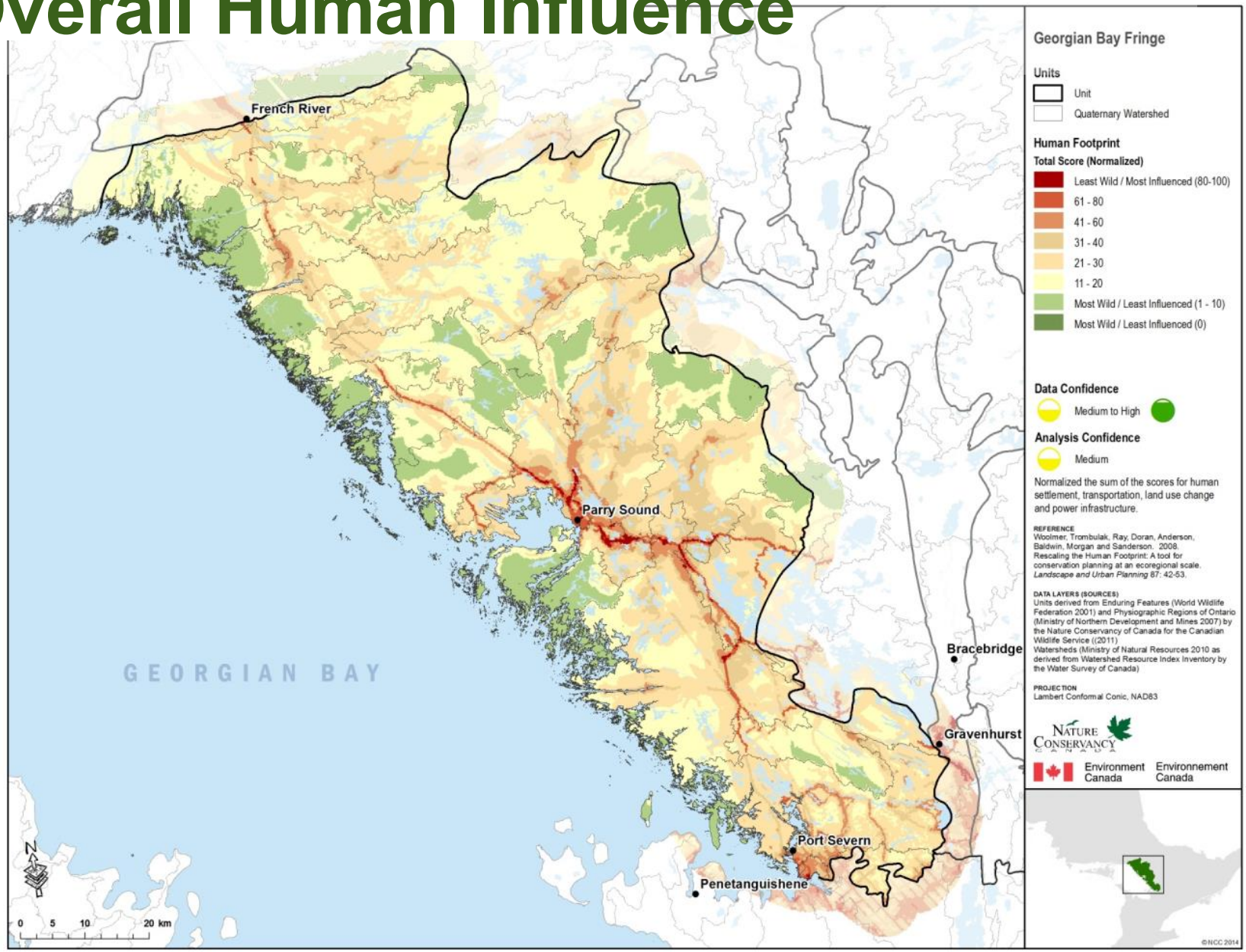
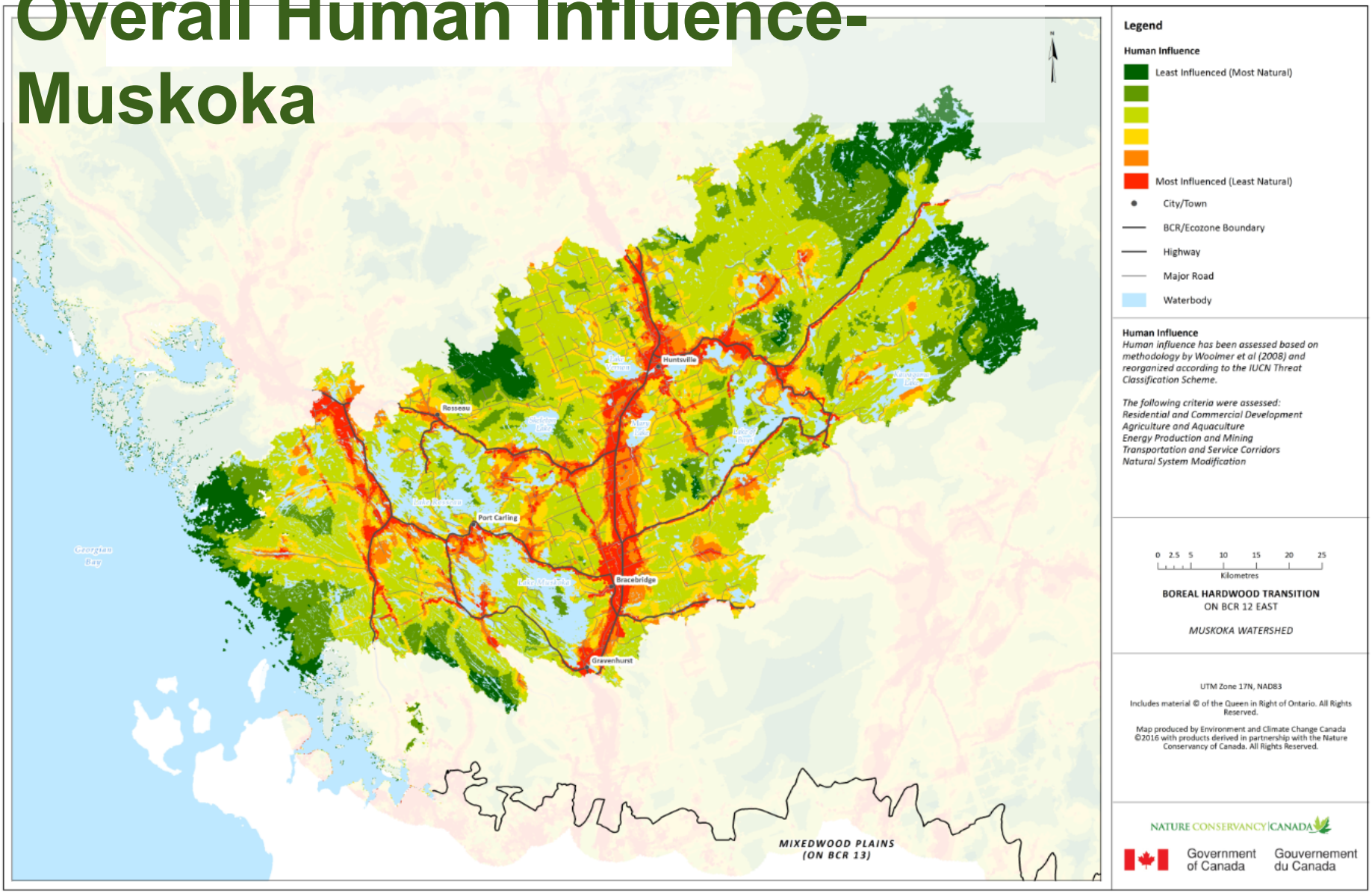
Overall Human Influence



Overall Human Influence- Muskoka



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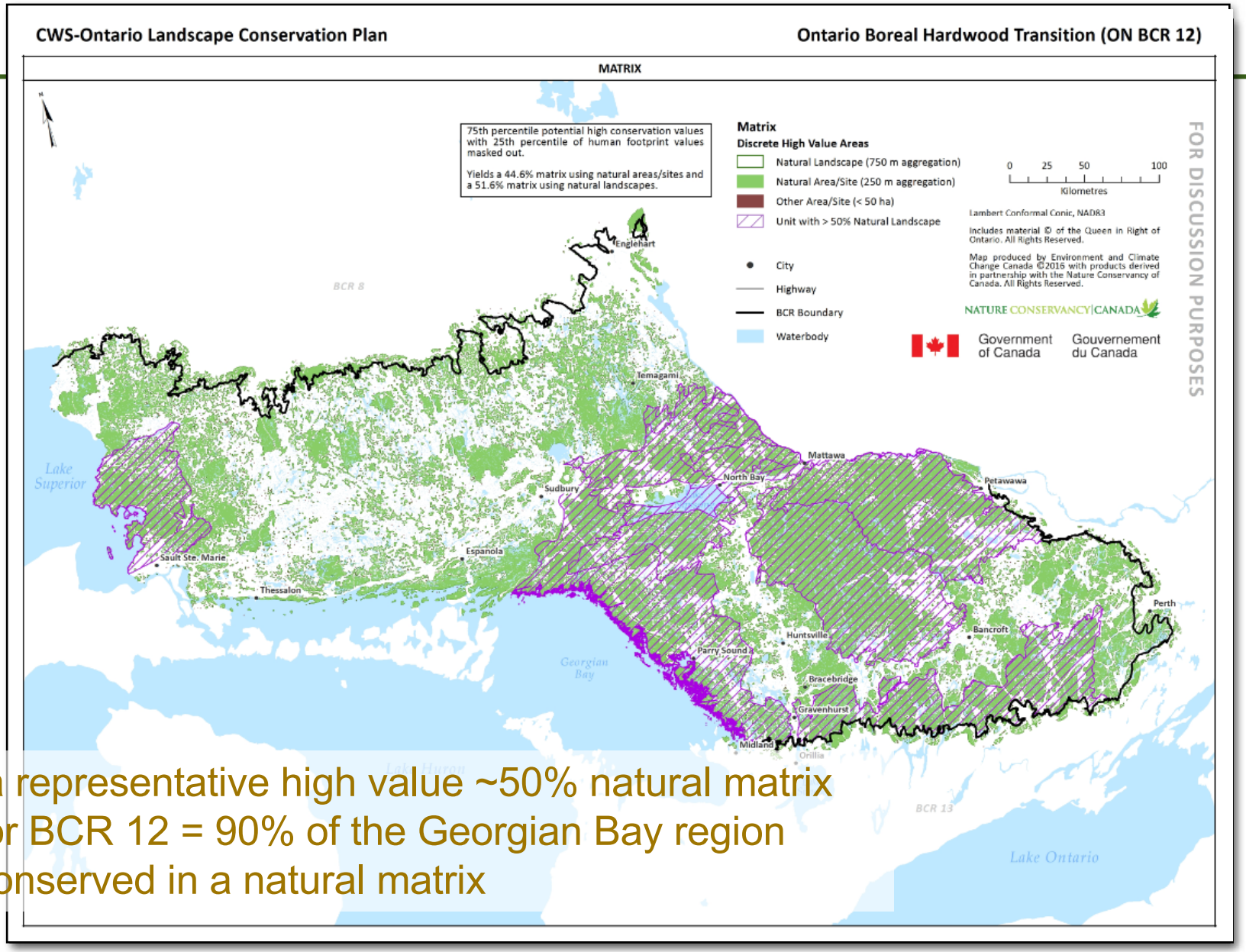
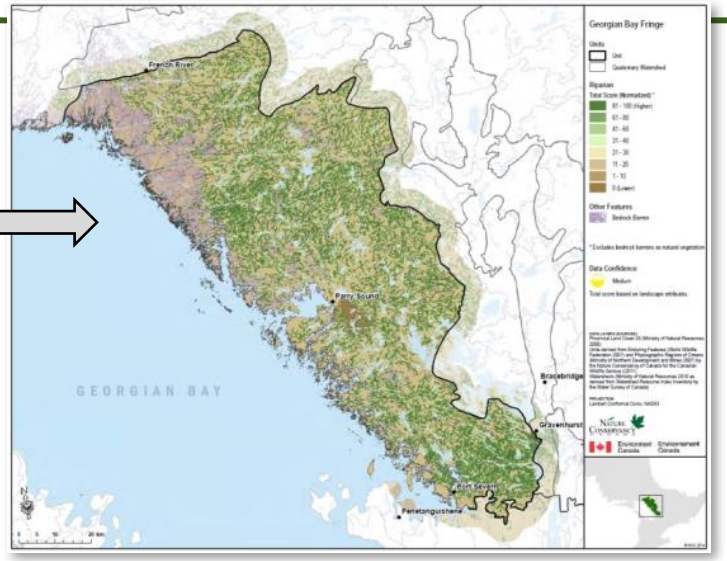
~50% natural matrix for BCR 12:

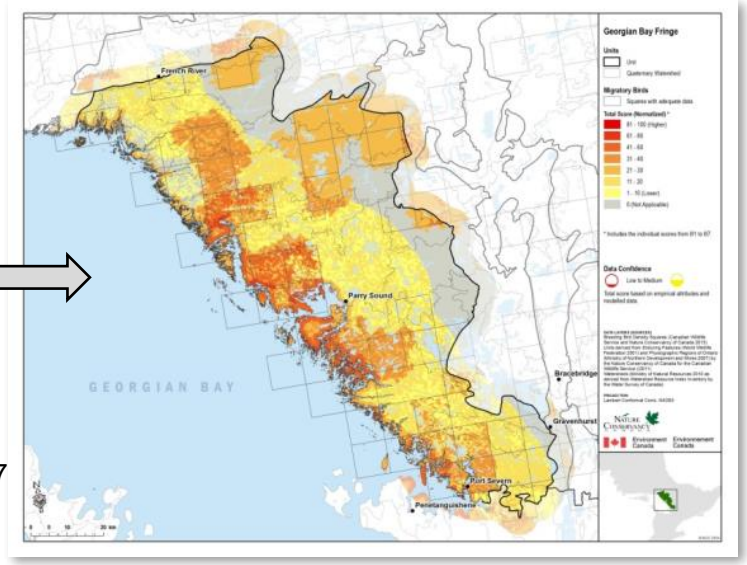


a representative high value ~50% natural matrix for BCR 12 = 90% of the Georgian Bay region conserved in a natural matrix

Limitations and potential issues

- **Special or unique features:** Granite barrens showed up as low scores
- **Human Influence**: under-represent populated shorelines? Issues with distribution of human population. Roads as disturbance vectors but not barriers.
- **Threats analysis:** none
- **Connectivity:** connectivity was a criterion for forest score only.
- **Survey effort – data gaps**: such as breeding bird atlas coverage
- **Local knowledge, local review**





Considerations…

- What are the right thresholds?
- What are the best Human Influence criteria?
- Are existing criteria applied properly?
- How do we introduce connectivity?
- What about existing protected areas?
- Error – is it increasing or decreasing with multiple, often correlated layers?
- Reality check – does this make sense?
- Context: guidelines + maps do not equal a complete planning process

Guidance on places of biodiversity value…

Two complementary interests and approaches:

- **Amounts and types of habitat – habitat guidelines**
- **Places of interest – biodiversity atlas**

The **guidelines** and **atlas** help allow CWS to better understand the distribution and the state of habitat and landscapes, share that information and provide guidance, helping to facilitate the conservation of important natural places.