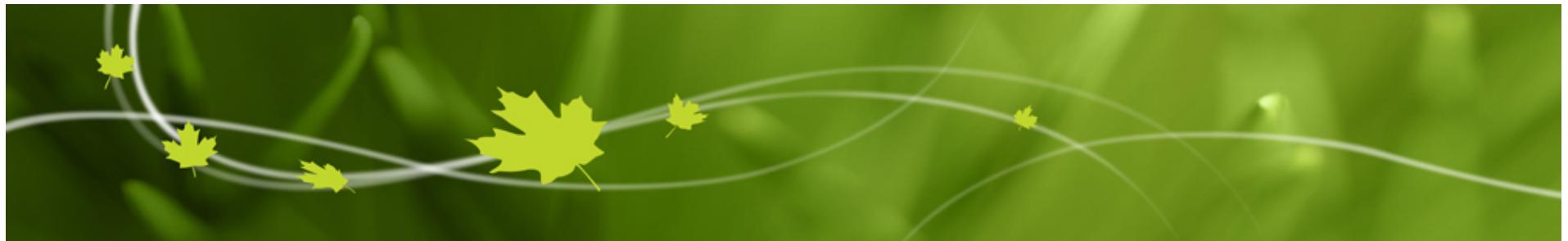




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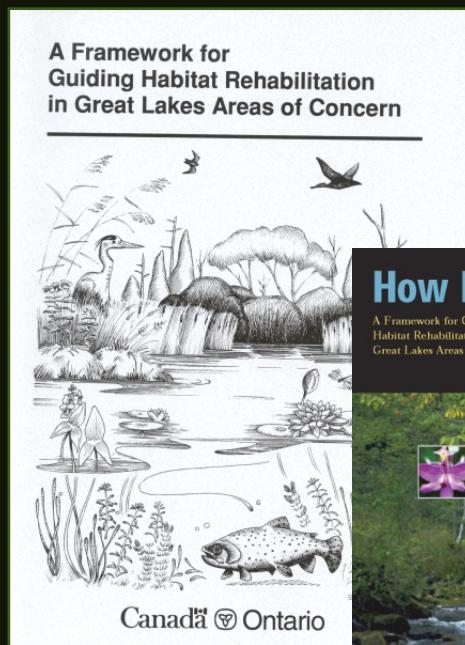


# How Much Habitat is Enough?

Third Edition

Canadian Wildlife Service  
2017



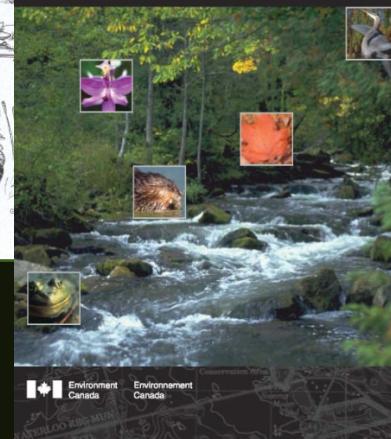


## How Much Habitat is Enough?

A Framework for Guiding  
Habitat Rehabilitation in  
Great Lakes Areas of Concern

Second Edition

Environment Canada Environnement Canada



## How Much Habitat is Enough?

Third Edition



Canada



## Grasslands

### Forest



## Wetlands

### Riparian & Watershed



**At a minimum, the greater of (a) 10% of each major watershed and 6% of each subwatershed, or (b) 40% of the historic watershed wetland coverage, should be protected and restored.**

**Wetlands that are in close proximity to each other, based on their functions, or that are in close proximity to other natural features, should be given high priority in terms of landscape planning.**

**30 m wide naturally vegetated adjacent to streams, greater depending on conditions**

**75% of stream length should be naturally vegetated**

**forest patches should be within 2 km of each other or other supporting habitat feature**

**Significant impairment in stream water quality and quantity is highly likely above 10% impervious land cover and can often begin before this threshold is reached. In urban systems a second threshold is likely reached at the 25 to 30%**

**30% watershed forest cover is a high risk minimum, 50% cover is a low risk cover.**

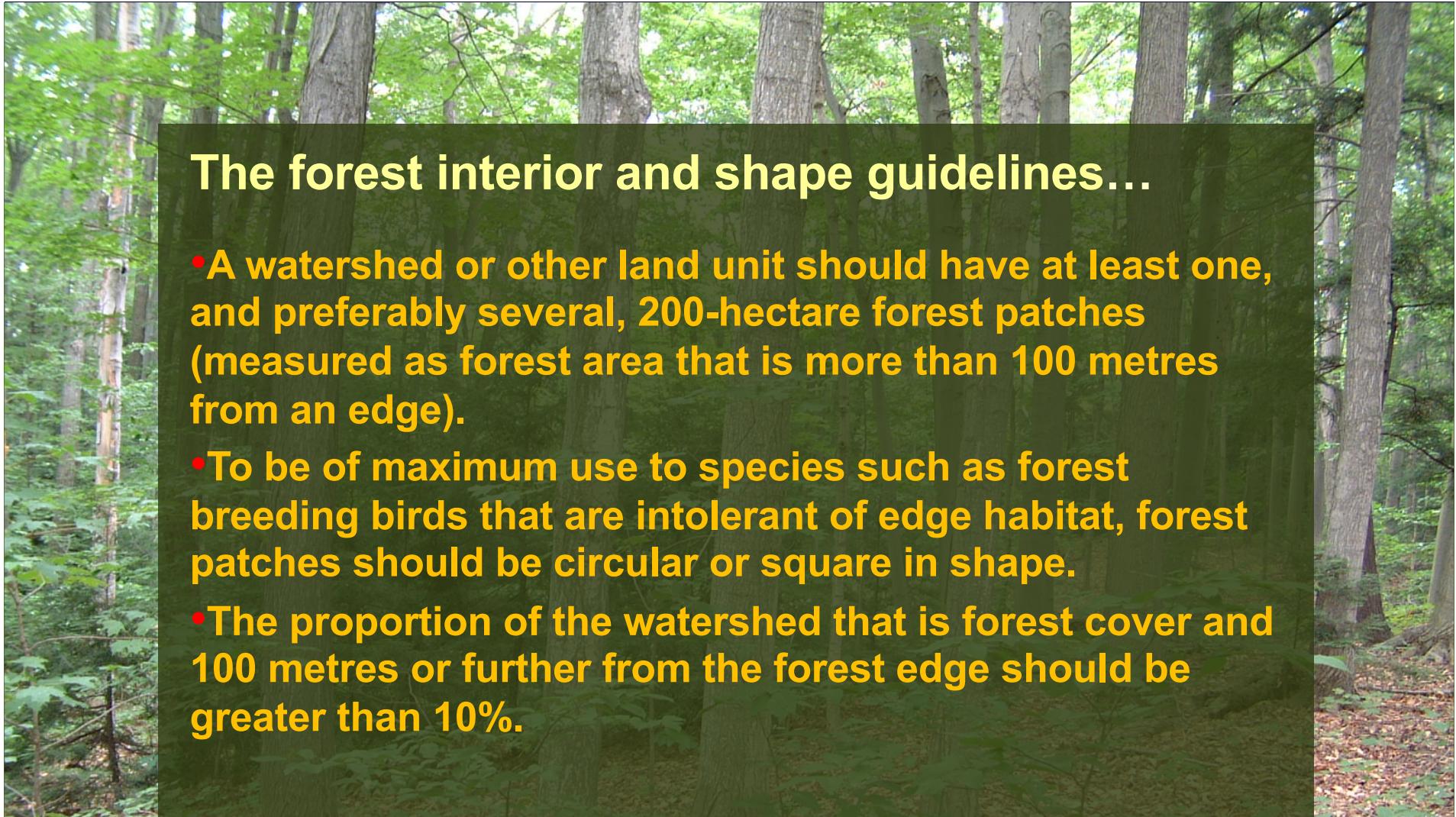
**Focus on restoring and creating grassland habitat in existing and potential grassland landscapes.**

# HMHE – Use

- Used in Natural Heritage Strategies and Official Plans, watershed plans, land acquisition strategies, environmental assessment, postsecondary classrooms, etc.
- Now used across Mixedwood Plains and well beyond.
- The *Framework* has evolved into a wider ‘framework’ for protection, conservation and restoration.



*The guidelines...*



## The forest interior and shape guidelines...

- **A watershed or other land unit should have at least one, and preferably several, 200-hectare forest patches (measured as forest area that is more than 100 metres from an edge).**
- **To be of maximum use to species such as forest breeding birds that are intolerant of edge habitat, forest patches should be circular or square in shape.**
- **The proportion of the watershed that is forest cover and 100 metres or further from the forest edge should be greater than 10%.**





## Percent Forest Cover

### **At the watershed scale:**

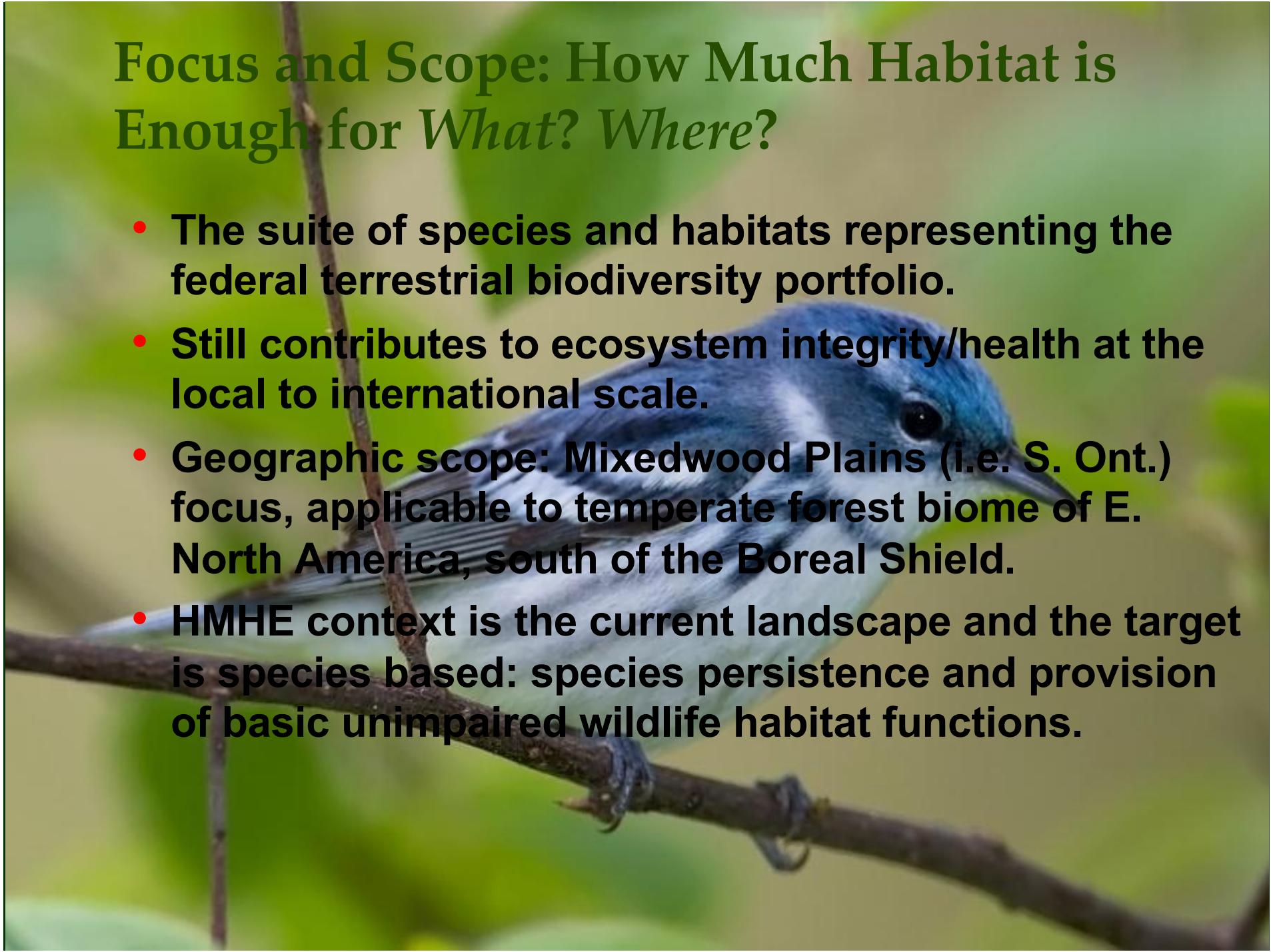
- **30% minimum forest cover equates to a high-risk approach that may only support less than one half of the potential species richness, and marginally healthy aquatic systems;**
- **40% forest cover equates to a medium-risk approach that is likely to support more than one half of the potential species richness, and moderately healthy aquatic systems;**
- **50% forest cover or more equates to a low-risk approach that is likely to support most of the potential species, and healthy aquatic systems.**



## Big Woods

- “Big Woods” areas, representing concentrations of smaller forest patches as well as larger forest patches, should be a cornerstone of protection and enhancement within each watershed or land unit.



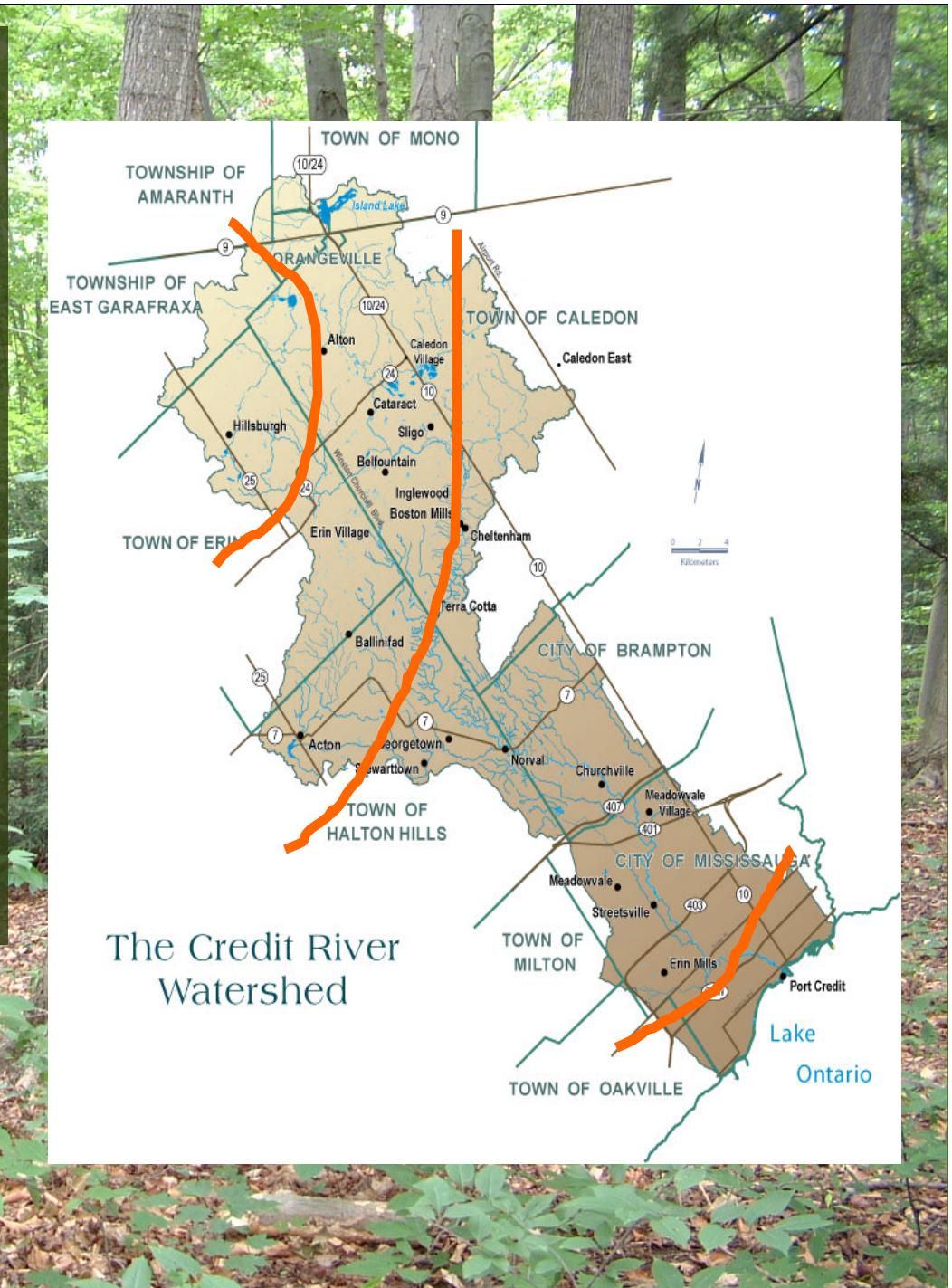


# Focus and Scope: How Much Habitat is Enough for *What? Where?*

- The suite of species and habitats representing the federal terrestrial biodiversity portfolio.
- Still contributes to ecosystem integrity/health at the local to international scale.
- Geographic scope: Mixedwood Plains (i.e. S. Ont.) focus, applicable to temperate forest biome of E. North America, south of the Boreal Shield.
- HMHE context is the current landscape and the target is species based: species persistence and provision of basic unimpaired wildlife habitat functions.

# Forest Quality: Species Composition and Age Structure

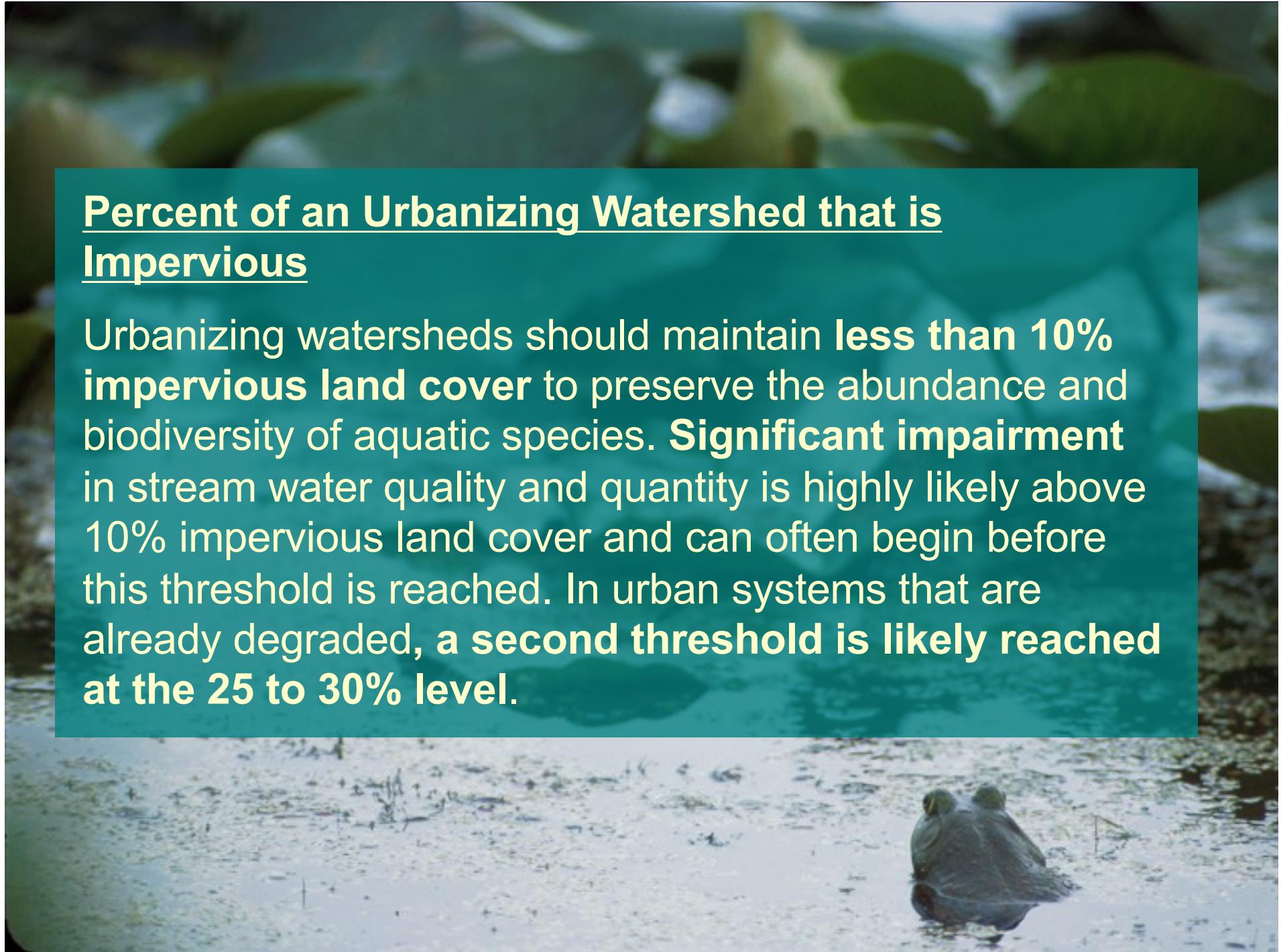
- Watershed forest cover should be representative of the full diversity of naturally occurring forest communities found within the ecoregion. This should include components of mature and old growth forest.



The Credit River Watershed

## Percent of an Urbanizing Watershed that is Impervious

Urbanizing watersheds should maintain **less than 10% impervious land cover** to preserve the abundance and biodiversity of aquatic species. **Significant impairment** in stream water quality and quantity is highly likely above 10% impervious land cover and can often begin before this threshold is reached. In urban systems that are already degraded, **a second threshold is likely reached at the 25 to 30% level.**



### Percent of stream length naturally vegetated

- 75% of stream length should be naturally vegetated

### Width of natural vegetation adjacent to stream

- Both sides of streams should have a minimum 30 m wide naturally vegetated riparian area to provide and protect aquatic habitat. The provision of highly functional wildlife habitat may require total vegetated riparian widths greater than 30 m.





## Percent Wetlands in Watersheds and Subwatersheds

- **No net loss of wetland area, maintain and restore wetland functions at a watershed and subwatershed scale based on historic reference conditions.**
- **At a minimum, the greater of (a) 10% of each major watershed and 6% of each subwatershed, or (b) 40% of the historic watershed wetland coverage, should be protected and restored.**

## Amount of Natural Vegetation Adjacent to the Wetland

**Critical Function Zones** should be established around wetlands based on knowledge of species present and their use of habitat types.

**Protection zones** should protect the wetland attributes from stressors. Recommended widths should consider sensitivities of the wetland and the species that depend upon it, as well as local environmental conditions (e.g. Slopes, soils and drainage), vegetative structure of the Protection Zone, and the nature of changes in adjacent land uses. Stressors need to be identified through Protection Zone design.

## Wetland Shape, Area and Diversity

Capture the full range of wetland types, areas and hydroperiods that occurred historically within the watershed. Swamps and Marshes of sufficient size to support habitat heterogeneity are particularly important, as are extensive swamps with minimum edge and maximum interior habitat to support area-sensitive species.

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# Grasslands



# Grassland Habitat Guidelines

## Grassland is different...

- A minority natural habitat in a wetland and forest dominated biome/matrix
- that became the dominant matrix as a surrogate (agricultural) habitat
- That enabled new species to settle
- And increased populations of taxa such as grassland birds
- And then the habitat started declining
- But the new species stayed but started to also decrease in number
- And we have to conserve them
- And the surrogate habitat relies on humans to persist
- And leaves us asking what is 'natural'?
- And does it matter what's natural?

# Grassland Habitat Guidelines

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## What to do?

- **Should it be grassland?**
- **What should that grassland look like? What functions should it perform?**
- **What is realistic?**
- **How do we move forward?**
- **‘Should I plant trees or not?’**

## Where to Protect and Restore

- Focus on restoring and creating grassland habitat in existing and potential grassland landscapes.

## Habitat Type and Area

- Maintain, restore and create native grassland patches to their historic extent and type at a county, municipal and/or watershed scale considering past presence and current conditions.
- Any increase in native grassland is positive given 97% loss of what was never an extensive habitat (e.g. 100,000 ha prairie in S. Ont. estimate)
- If there is an extent threshold for native grassland species we are likely below it
- More is better for overall grassland but no known threshold currently
- At least use past conditions as a guide

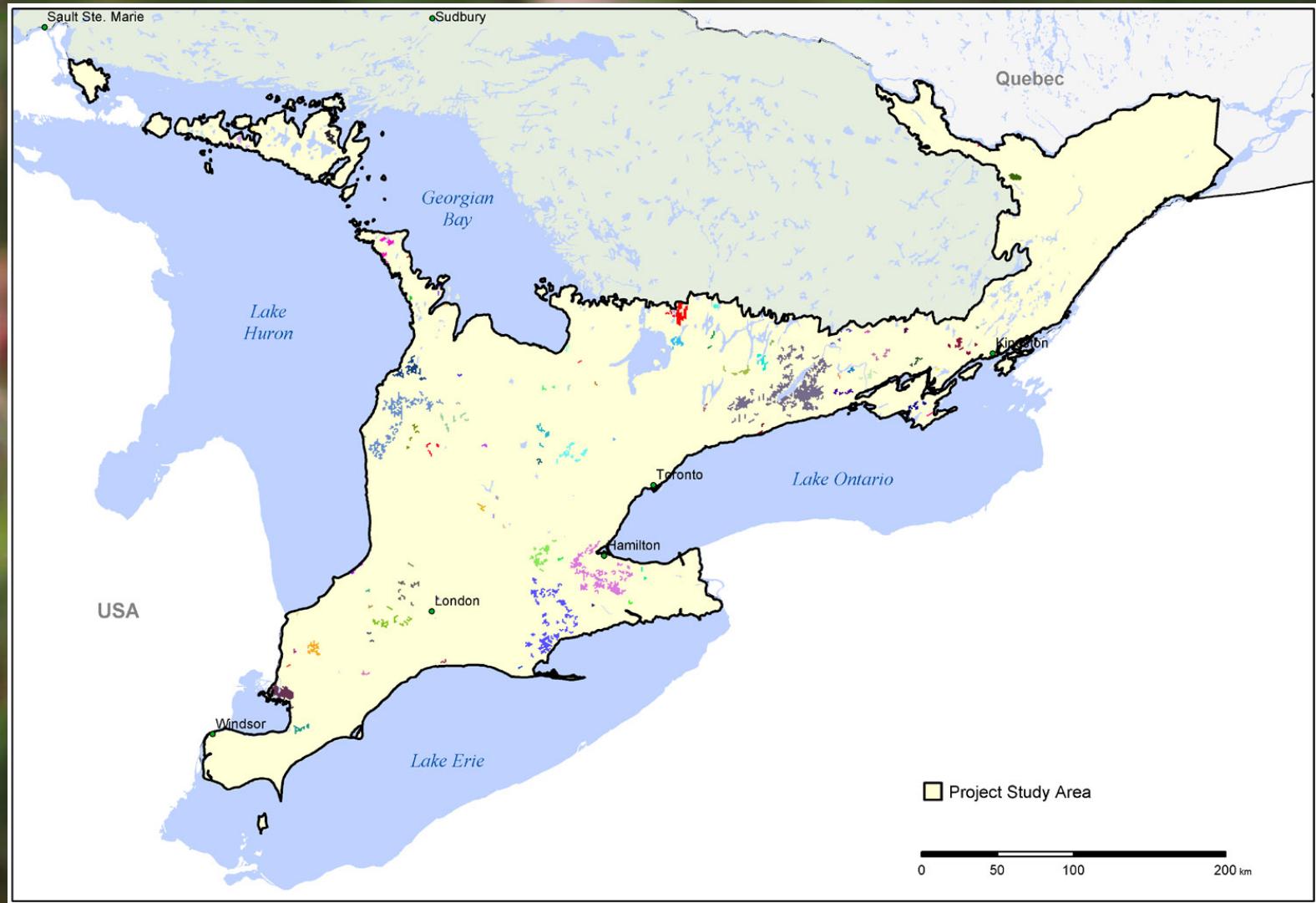
## **Patch size**

- Maintain and create small and large grassland patches in existing and potential local grassland landscapes, with an average grassland patch area of greater than or equal to 50 hectares and at least one 100-hectare patch.

## **Landscape heterogeneity**

- Some grassland habitat should be located adjacent to hedgerows, riparian and wetland habitats for species that require different habitat types in close proximity.

# Mapping Existing and Potential Grassland Landscapes: Results



# Corridors and Proximity

## Proximity to other forested patches

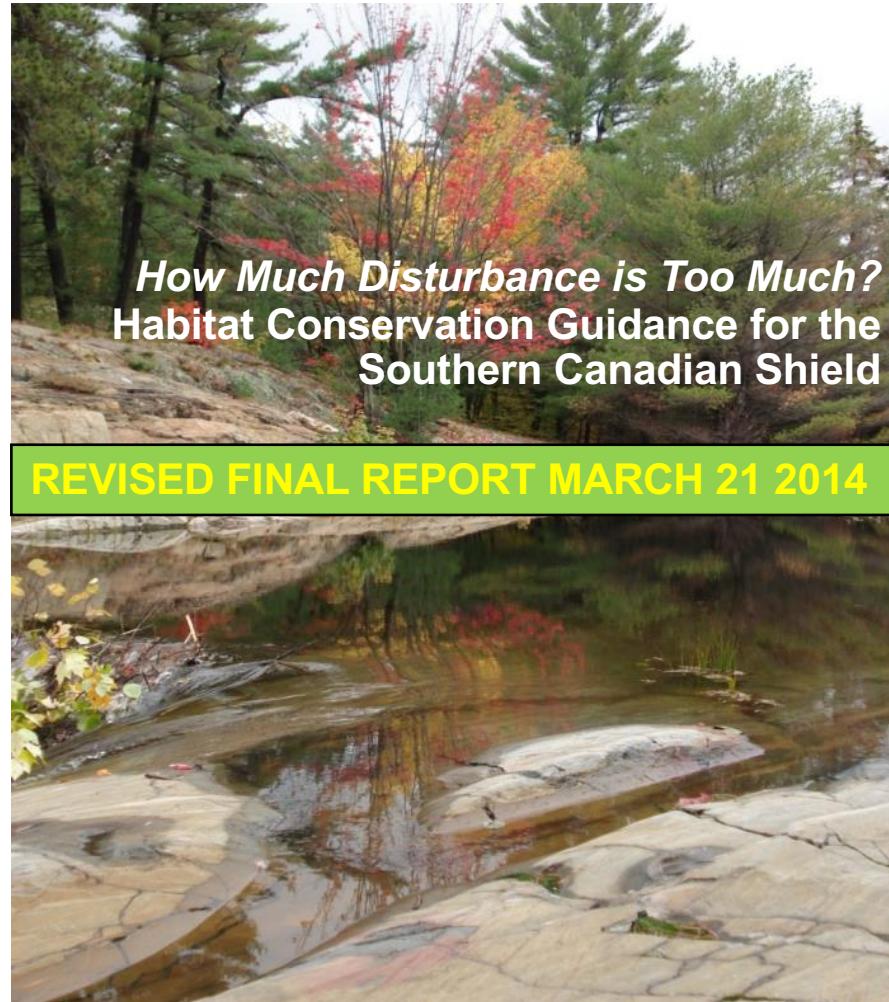
- To be of maximum use to species such as forest birds and other wildlife that require large areas of forest habitat, forest patches should be within two kilometres of one another or other supporting habitat features.
- “Big Woods” areas, representing concentrations of smaller forest patches as well as larger forest patches, should be a cornerstone of protection and enhancement within each watershed or land unit.

## Landscape configuration, heterogeneity and connectivity

- Forest corridors will vary with function, 50-100m to facilitate species movement, potentially larger and more specialized for breeding.
- Grassland habitat patches should be clustered or aggregated, and any intervening land cover should be open or semi-open in order to be permeable to species movement.

Going North...

# Habitat guidance for the Southern Boreal Shield (aka HMDITM)



Page 26 – April 19, 2017



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# Southern Shield guidance

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- **Response to request for guidelines specifically for Shield environment**
- **Different from HMHE:**
  - Relatively intact vs. fragmented landscape
  - Opportunity to protect and conserve, not just restore
  - Less available science relevant to southern shield
- **How to deal with dominant natural matrix with an embedded, but growing, human footprint.**
- **Still draft** – focus has been on mapping a couple of the key overarching guidelines



# Southern Shield: key guidance

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- *Identify and conserve, respectively, Regional Habitat Mosaics and Local Habitat Mosaics that capture relatively high levels and/or concentrations of **habitat diversity** and are predominantly natural areas subject to **low levels of disturbance by human activities**.*
- *Regional Habitat Mosaics and Local Habitat Mosaics should cover at least **50 to 60 percent of their respective jurisdiction**. These mosaics should include habitats that are *uncommon in the landscape* as well as good representations of more common habitat types, a diversity of age classes for forested habitats and **promotion of landscape connectivity**.*



# Other HMDITM guidance...

Ensure habitat mosaics provide for full range of species, especially those sensitive to lakeshore development

Maintain buffers between important wetlands and roads

Avoid roads in regional and local habitat mosaics

Lakeshore connectivity cannot necessarily be compensated by habitat corridors away from the lakeshore

Maintain large contiguous habitat patches

Focus on conserving diversity of wetlands

Maintain Critical Function Zones and Protection Zones for wetlands

Consider the positive ecological influence of natural lakeshores and potential negative influence when disturbed or developed

No development zones around portions of lakes and rivers

Avoid locating roads between wetlands

Consider the connectivity needs of species at risk as a model for establishing landscape connectivity

# Overarching guidance

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## Take a habitat mosaic approach

*In brief...*

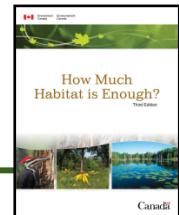
- *Conserve 50-60% of the landscape at low levels of human disturbance*
  - *Predominantly natural*
  - *High habitat diversity*
  - *Uncommon and representative habitats*
  - *Large patches*
  - *Range of forest age classes*
  - *Connected, un-fragmented*



**uses, lessons & considerations...**

# HMHE3 – just guidance...

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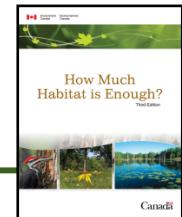


- Guide, not dictate local decisions.
- Providing planners, rehabilitation teams, and other decision makers with the best available information to enable them to make their own decisions on how much habitat is required to rehabilitate local watersheds and landscapes.
- The framework does not represent policy or legislation.
- The guidelines provided are not intended as mandatory limits or targets, and it is not intended that every area meet the guidelines expressed here.
- If the guidelines are adapted into policy, care must be taken to consider the limitations and context found in the guideline supporting text.
- The best practice is to study and refer directly to the literature cited within the supporting text.



# Using the Guidelines: Considerations

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- Conserve it first
- Guidelines are minimums!
  - \* Do not manage down – any loss in habitat will result in impaired habitat and ecological function
- Adapt first, adopt second
- Look beyond local boundaries
- Consider landscape context
- Acknowledge stressors beyond habitat
- Acknowledge the limits of land use planning, restoration and protection
- Species at risk – follow recovery documents first
- Urban areas – may require different guidance and approach



# Limitations, caveats, cautions

habitat is closer than it

appears, do not take with alcohol, may cause headaches, may cause drowsiness, ....

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- **Go back to the science, local conditions rule, these are general guidelines.**
- There are also **clear limits to prescriptive advice and planning.**
- Respond to questions...





# Canada

