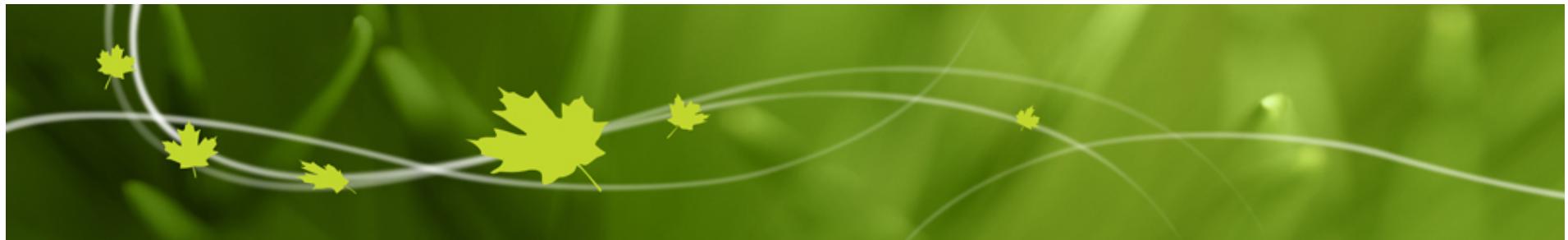




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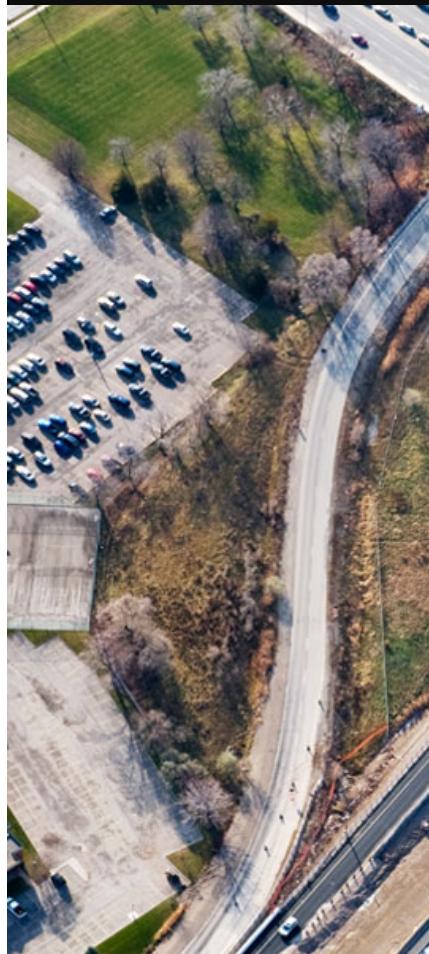
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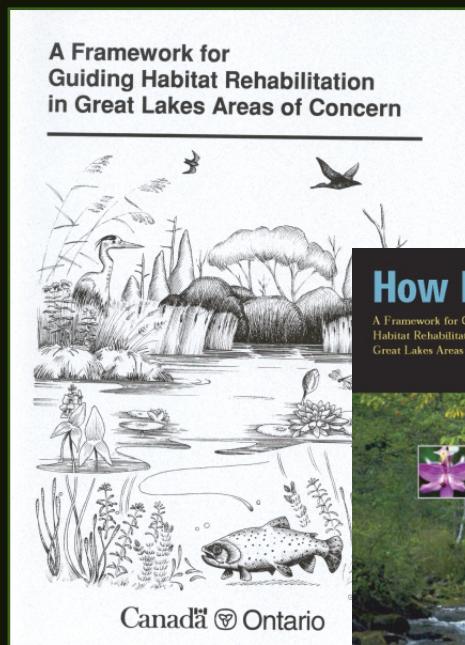


How Much Habitat Is Enough?

How Much Disturbance is Too Much?

Jocelyn Sherwood
Canadian Wildlife Service - Ontario
January 27th, 2017



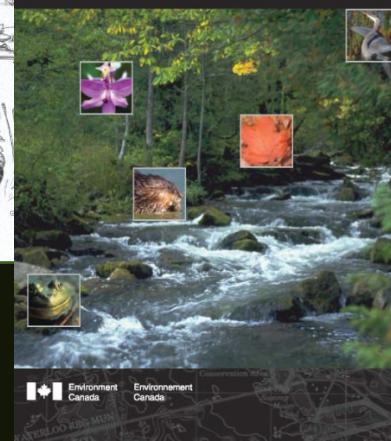


How Much Habitat is Enough?

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



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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% level.

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.

How much habitat is enough for **what**?



- CWS has a mandate that includes birds, the globally rare, cross-jurisdictional species and species at risk.
- This mandate may not align with your mandate.



Forest Guidelines

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.**



Forest 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%.**



Forest Guidelines

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.

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.



Riparian and Watershed Guidelines

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.**



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Riparian and Watershed Guidelines

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.



Wetland Guidelines

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.**



Wetland Guidelines

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 Guidelines

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.



Grassland Guidelines

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)
- More is better for overall grassland but no known threshold currently
- At least use past conditions as a guide



Grassland Guidelines

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.



Does anyone use these guidelines? Yes.

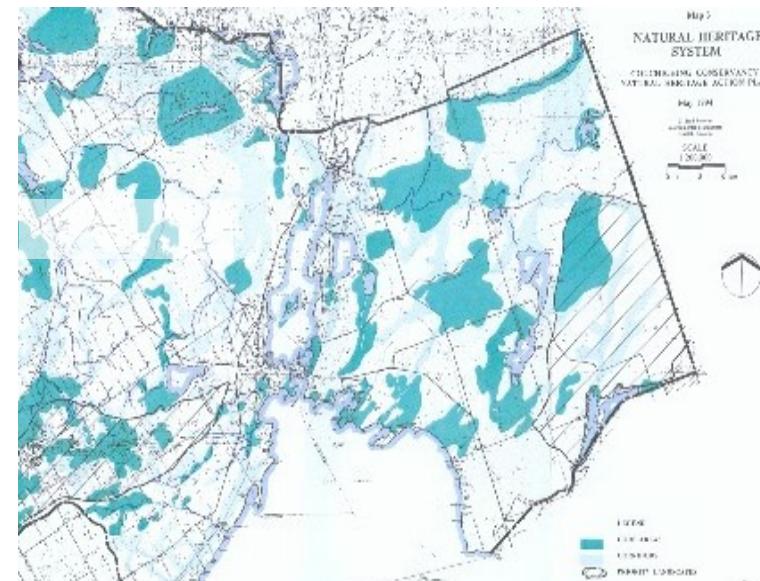
- Used in Natural Heritage Strategies and Official Plans, watershed plans, land acquisition strategies, environmental assessment, postsecondary classrooms, etc.
- Now used across Mixedwood Plains and well beyond.
- The *Framework* has evolved into a wider ‘framework’ for protection, conservation and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



WHY use HMHE? *RESOLUTION*

- They are the **right resolution** for users:
- Land use planners in southern Ontario don't plan for individual species..
- And traditionally they didn't plan for habitats...
- They do plan for overall natural cover.

Natural Heritage Systems..



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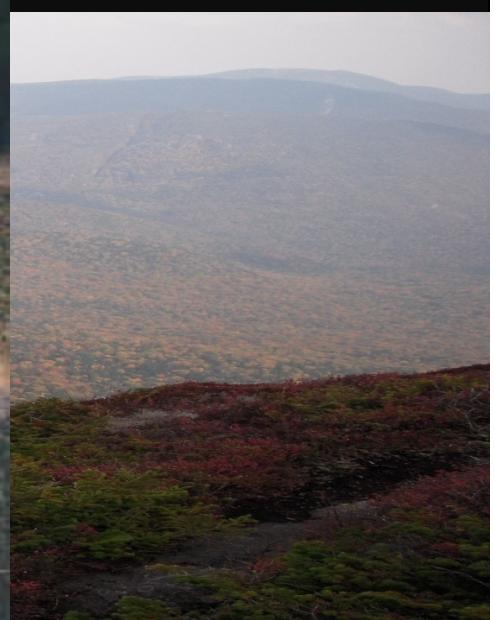
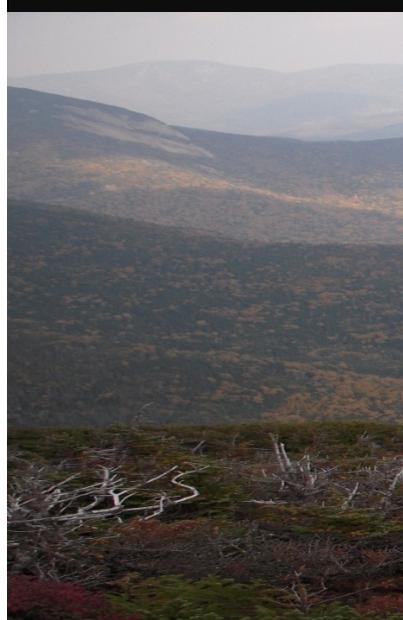
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WHY use HMHE? *MEASUREABLE*

Greater than 6%
of each Less than 10% impervious
30 m wide At least 30% - 50%
should be within 2 km
of each other Greater than 10% of each
75% of stream length
50-100 m width





Habitat Guidance for the Southern Boreal Shield (aka HMDITM)



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Southern Shield Guidelines

- Loss of Natural Cover: Riparian Areas and Lakeshores, Forests and Wetlands
- Development/Edge Effects into Terrestrial Habitats
 - Riparian Areas and Lakeshores
 - Forests
 - Wetlands
- Ecological Effects Associated with Roads
- Loss of Habitat Connectivity



HMDITM guidance...

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

Maintain
important
habitats

*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**.*

Avoid
habitat
loss

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

and portions of lakes

Lakeshore
habitat
loss

is between wetlands

Maintain large contiguous habitat patches

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

Focus on conserving diversity of wetlands

Maintain Critical Function Zones and Protection Zones for wetlands

Preliminary Guidance

- Regional and local planning authorities should identify, 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% 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**.



Habitat Mosaics - Considerations

- **Diversity**
 - Provide habitat for the full range of species occurring in an area
- **Naturalness**
 - The less disturbed an area is, the better its capacity for representation and maintenance of biodiversity
- **Habitat Area**
 - Include large blocks of habitat in order to sustain a higher level of ecosystem function, and to be more resilient to stressors
- **Proximity**
 - Closely clustered habitat patches are more likely to provide habitat to a greater range of species than those far apart



Habitat Mosaics - Connectivity

- Identify opportunities to connect Regional and Local Habitat mosaics
- Loss of lakeshore connectivity cannot necessarily be compensated by habitat corridors away from the lakeshore
- Consider as a model for establishing corridors and permeable landscapes, the connectivity needs of SAR in terms of life stages



Development: Riparian/Lakeshores

- Lakeshore environments need to be considered in terms of their value as a positive influence when in a natural state, and as a negative influence when disturbed or developed

Development zones

- Around portions of lakes and rivers, and around known wildlife corridors
- Maintain critical function zones and protection zones for wetlands



Development: Forests

- Spatial patterns and species composition are significant
- Edge-effects
- fragmentation



Development: Wetlands

- where development is occurring around wetlands, critical function zones and protection zones should be determined based on considerations for the site's sensitivities



Other Considerations

Roads

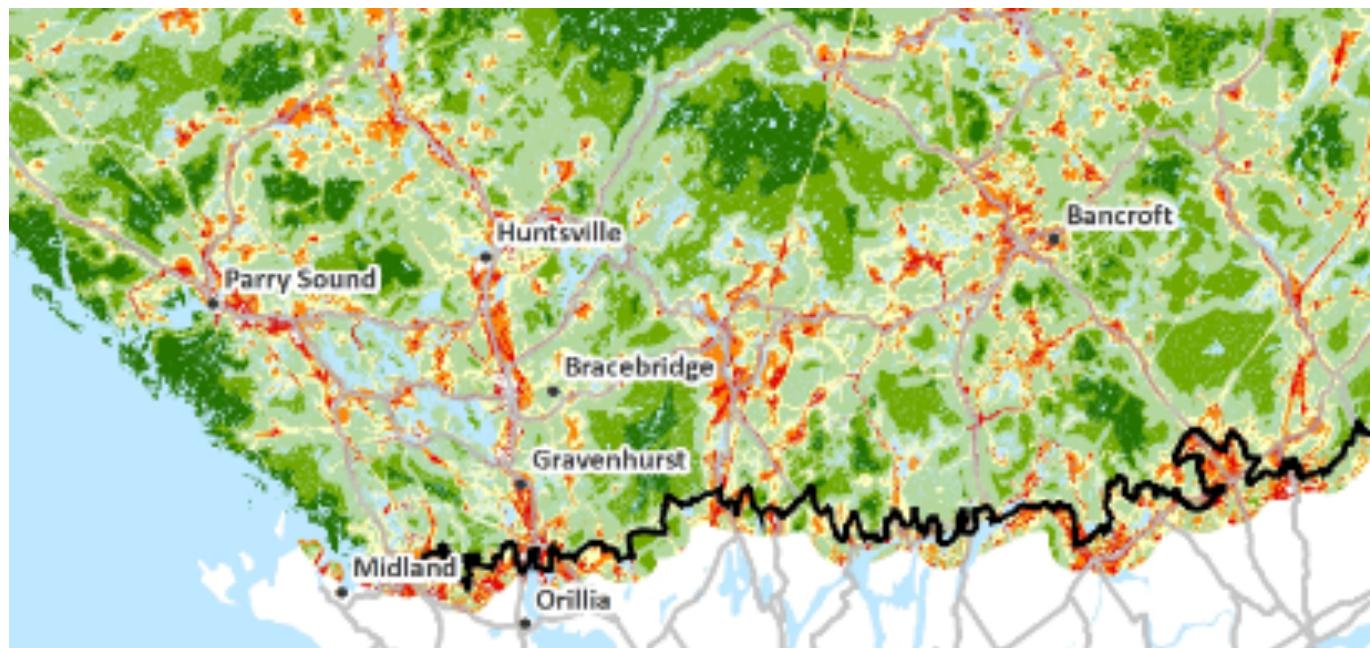
Where roads are essential:

- Accommodate for substantial buffers between important wetlands roads
- Avoid locating roads where wetlands occur on both sides
- Implement mitigation measures
- **Climate Change**
- **Ecological effects of recreation**



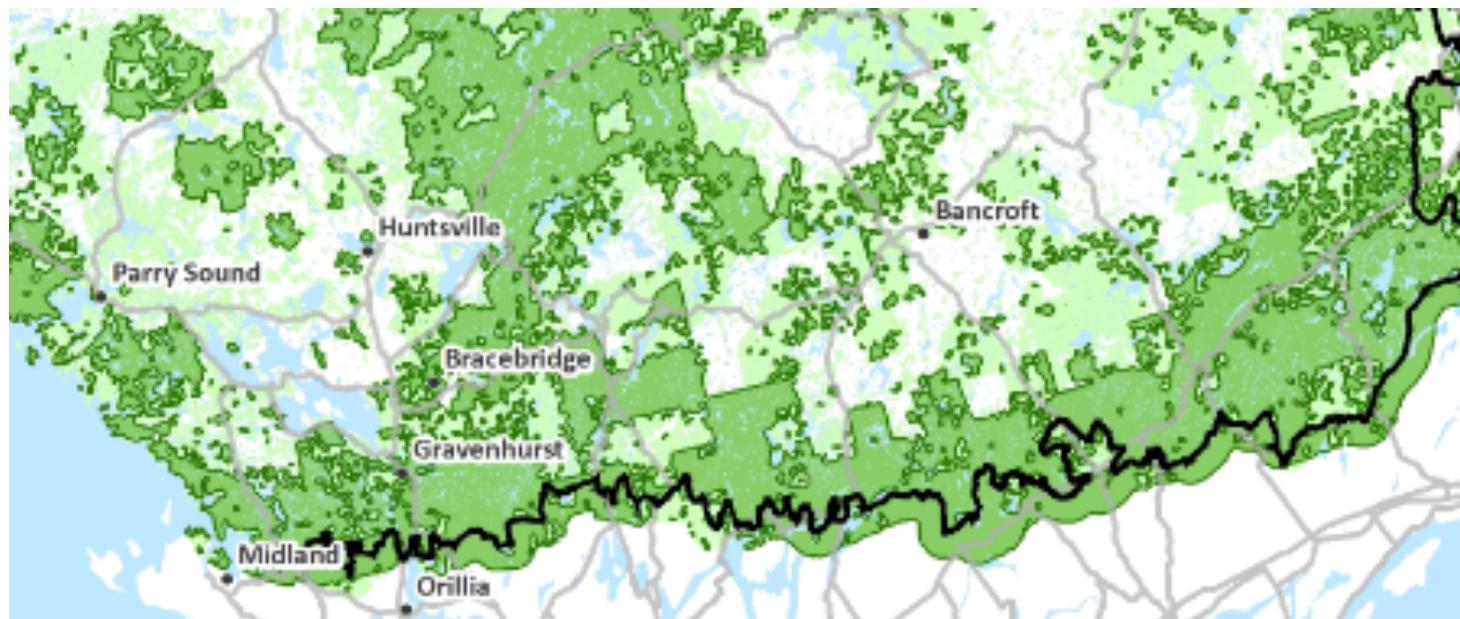
Habitat Mosaics + Human Influence

Assess areas of highest human influence



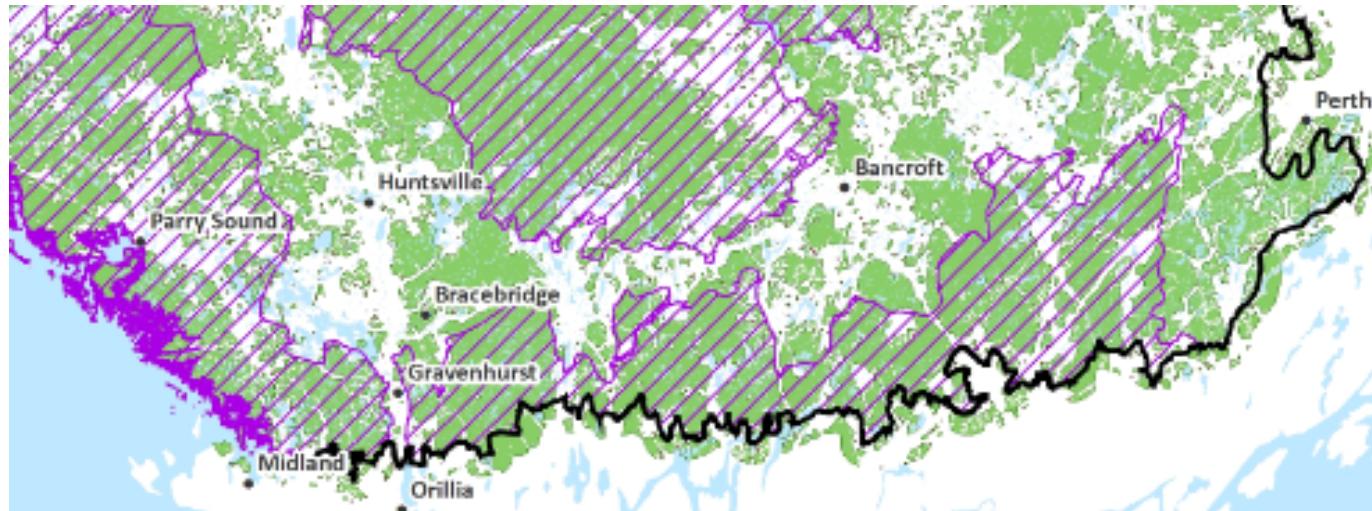
Habitat Mosaics + Human Influence

Establish Habitat Mosaics



Habitat Mosaics + Human Influence

50-60% Natural Cover



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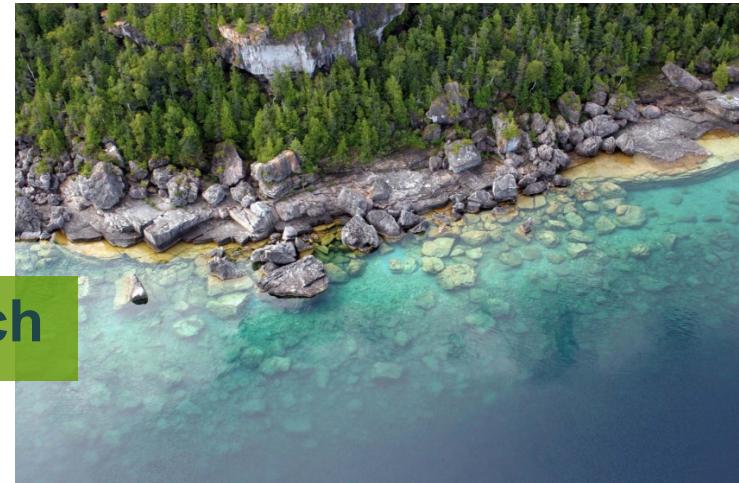
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Overarching guidance

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*

Take a habitat mosaic approach



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Conservation & other implications

- **Protection:** How much of the high biodiversity value areas and/or the natural matrix is protected? As per Aichi commitment of 17% or through land use planning or other means? Southern Shield fares better than the BCR 13 at the very least.
- **Thresholds:** 50-60% is one threshold: what other thresholds matter – ecological or otherwise? E.g. tourism
- **Land use planning:** are these guidelines useful for natural heritage plans? PPS designations? Securement strategies? Etc..



Guidance: DISCLAIMER

- 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.



Guidance: DISCLAIMER

- 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



