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How Much Habitat is Enough?

Third Edition

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October 4th, 2014



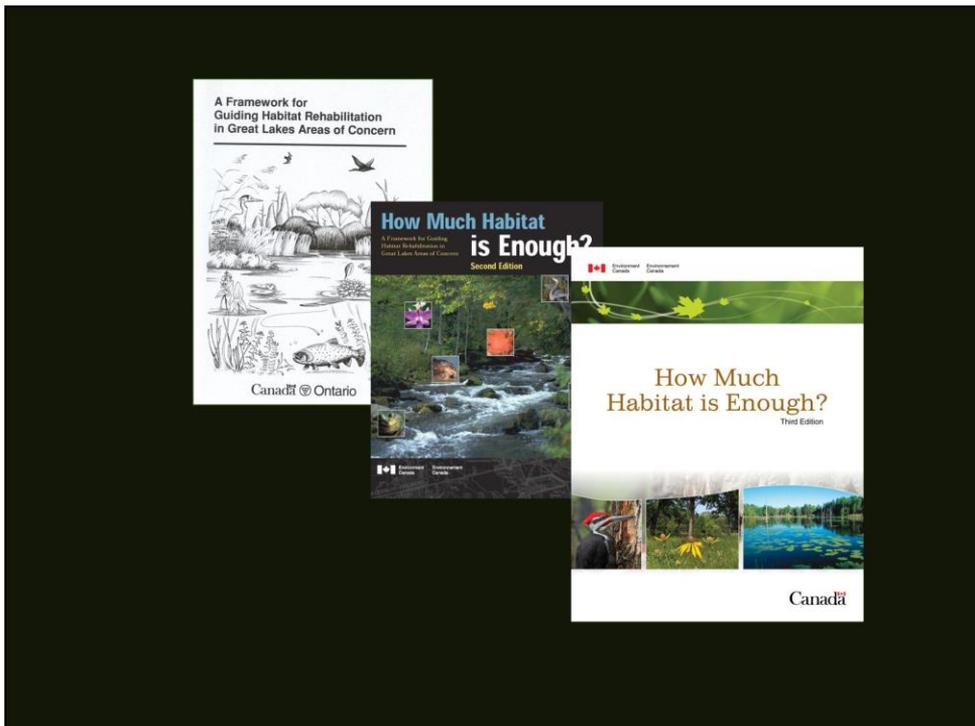
I am here to talk about guidelines and the science behind them that can be used to help set targets for species and habitat in southern Ontario.

And I am going to use the Credit watershed where I can as an example.

I hope this will be helpful.

But what may be more helpful is I am going to reflect on how and why we set targets – and maybe make you think a little more about the sort of watershed environment you want.

Full disclosure: I live in Alton about across the road from Shaw's Creek and I grew up in Erindale so I do have a bit of bias and a bit of vested interest.

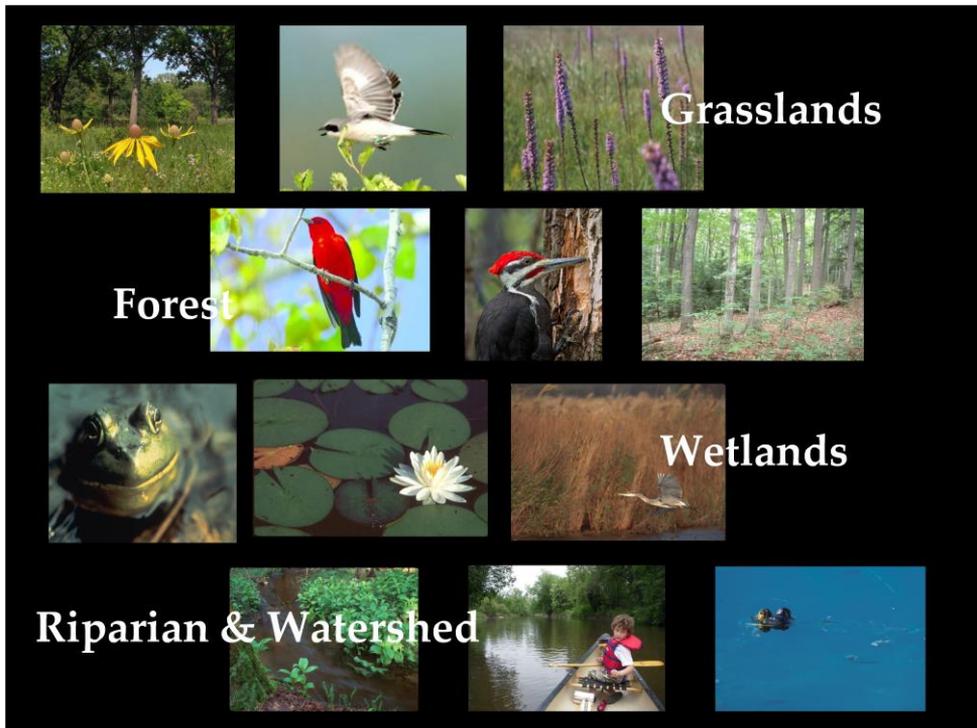


- I am going to give a bit of background first...

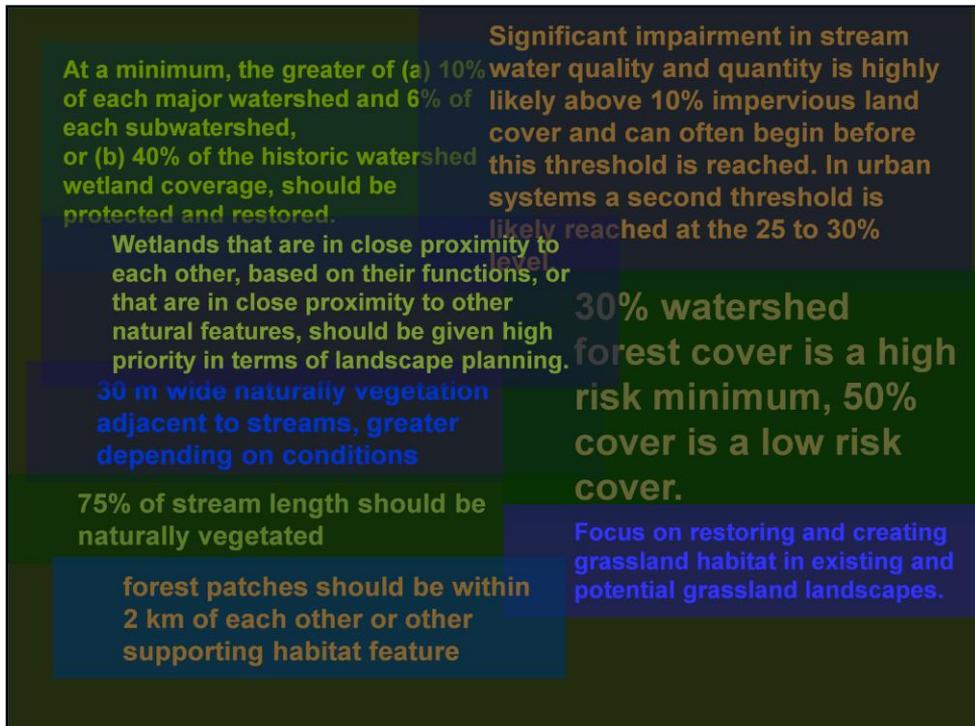
-How much habitat is enough? was the question posed by habitat restoration and protection agencies and organizations within Great lakes Areas of Concern

-The response from MOE, MNR and EC was a 'A framework for Guiding habitat Rehabilitation in Great lakes Areas of Concern' developed through lit review and field testing in the 1990's, first published in 1998.

- The Framework was revised in 2004 and the 3rd edition was released in 2013.



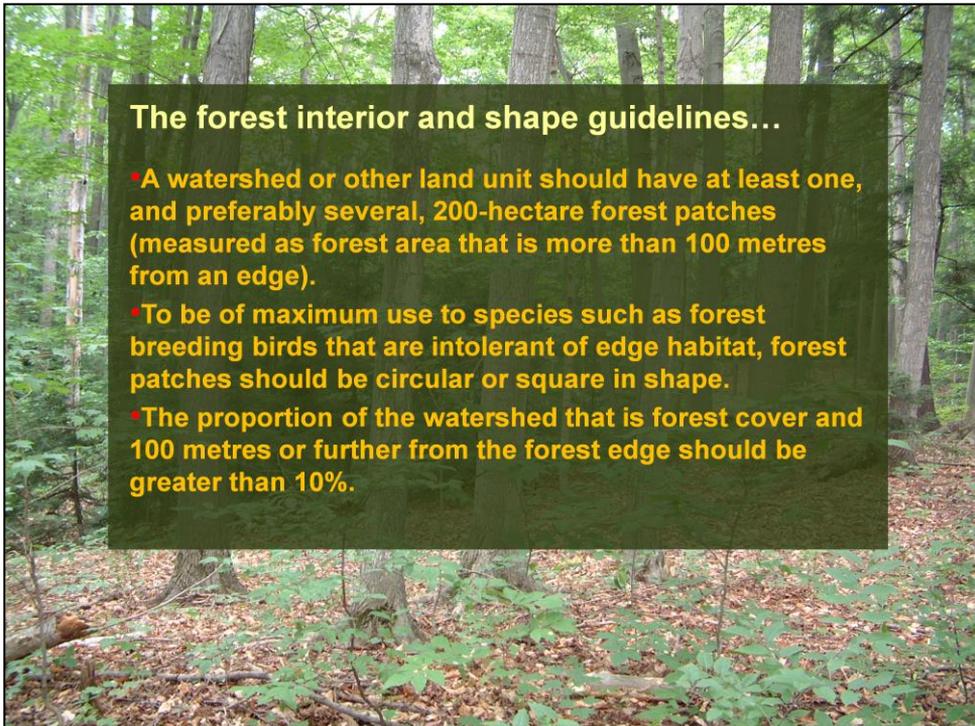
-How Much Habitat is Enough? is essentially a very large literature review with 21 guidelines regarding wetland, riparian, forest and now, grassland habitats.



...and this is what they look like [*animated slide of multiple guidelines*]

For those familiar with the guidelines we eliminated some, added some and generally edited or otherwise tweaked all other guidelines. We also more or less doubled the reference section, giving us a healthy 127 page.

The framework is science-based, basically it's a big literature review. I'll dissect one of the guidelines, 30% forest cover as an example of the process



Forests are good but better if they have interior forest – deep forest – for many species, especially area sensitive forest bird species





[Slide 30% forest cover] For those familiar with the old guideline: yes its been changed.

We looked at available science, in particular papers based on southern Ontario data and studies to originally arrive at a 30% guideline. This new risk-based guidelines reflects the literature – we are see studies citing 40, 50 or 60% also starting to see more lit on amphibian needs.

Also seeing some interesting draft unpublished work from Breeding Bird Atlas of Ontario reflecting a 30-50 or even 60% threshold – still being discussed

30% was never fully understood as a **minimum** – it was a passing mark at best

As part of the philosophy that how we use the land is decision that incorporates many values we decided to frame this in terms of risk

This is the grand-daddy of forest guidelines in its use but also the fact that almost all other considerations fade when forest cover is increased.



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.

guidelines represent one facet of biodiversity: the specific suite of species and habitats that represent the federal terrestrial biodiversity portfolio.

So there is often a bird focus. As well as SAR, transborder species, Great lakes, wetlands, Globally rare spp. Worth noting that birds are usually well studied and good indicators of ecosystem health.

Despite this particular focus restoring, recovering and protecting this federally mandated variety of species and habitats will result in a substantial contribution to ecosystem integrity/health at the local to international scale.

Mixedwood plains – applicable to temperate forest biome of E. North America, south of the Canadian Shield.

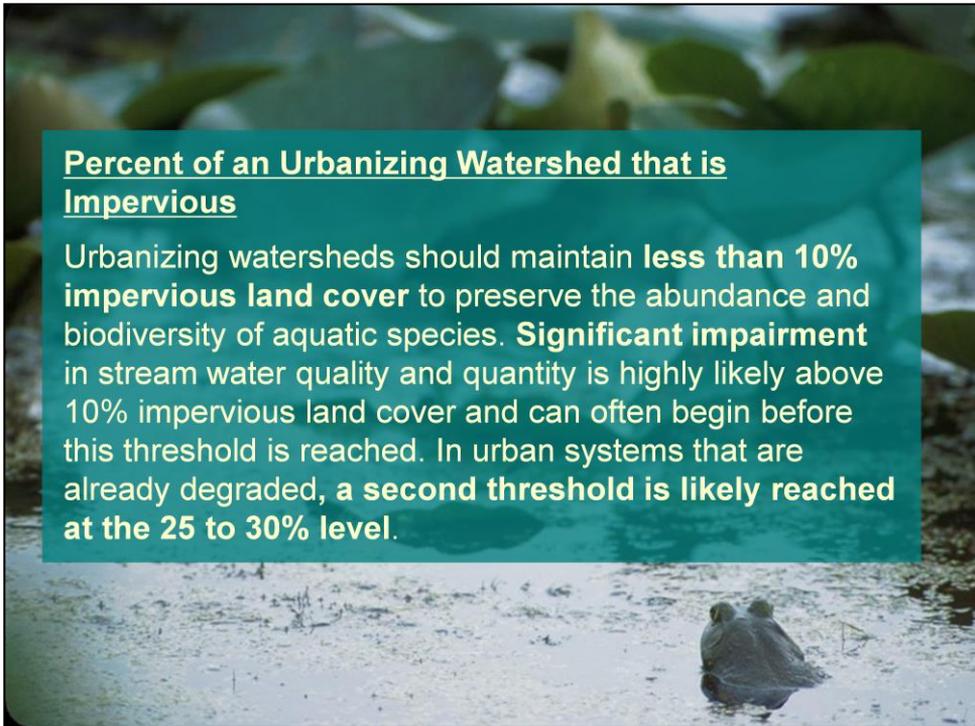
We aren't looking to go back to a pre-European settlement condition, we are looking at accommodating the maximum diversity of species within the current settled landscape.

So, when you set your own vision for your local environment be aware of the context of any advice, such as this, - what is your mandate?

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.





[Slide for imperviousness guideline] We followed the same process for other guidelines.

In settled mid-western and northeastern North America stream aquatic habitat fundamentally changes when watershed imperviousness increases above 10%.

We debated lowering this to below 10% but instead opted to change the wording to reflect how 10% is not Ok but a threshold for concern.

Percent of stream length naturally vegetated

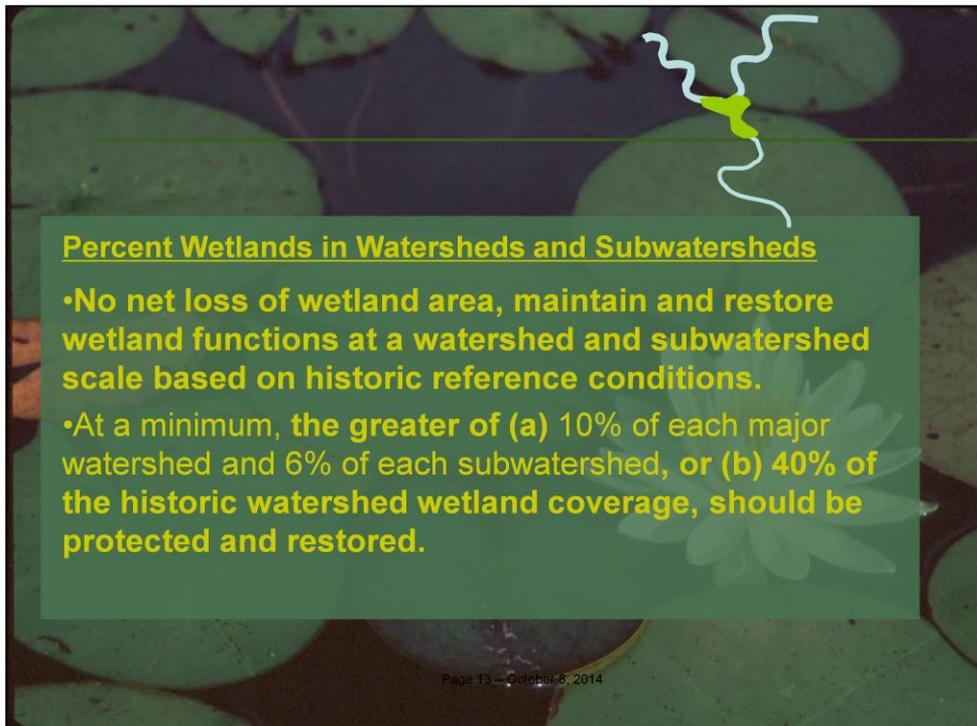
- 75% of stream length should be naturally vegetated

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.



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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.**

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[Slide for 10% wetland guideline]

Debated – big input from Angus Norman OMNR and others that **the target be historic coverage**

Problem – few definable thresholds for functions above 10% - many functions are likely lost but no good measures

Settled on **40%** based on a study showing **water quality improvement and biodiversity support declined significantly when 60% of upper midwest's historic wetlands** were drained.



- New are grassland guidelines. In response from our partners and practitioners for guidance.

- Most grassland is agricultural, most birds use this surrogate habitat and it has a tendency to appear and re-appear with crop and land prices. Lately this ephemeral agricultural habitat has been disappearing.

-Also diminishing are the populations of grassland birds.

- I don't have a guideline for how much agricultural grassland – such as hay and pasture - is enough to support grassland bird populations. We are working on it.

How we deal with grassland habitat was an eye openers for us and I think a great example of how we have to think hard when we think about what nature should look like in the 21st century.

Grassland Habitat Guidelines **NEW!**



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?



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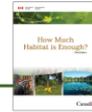
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We put in grassland guidelines due to demand, better literature and mandate needs.

After immersing myself in this for a few years and multiple drafts of this chapter allow me to summarize in a my own way

Grassland Habitat Guidelines



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?'**

This helps answer the 'should I plant trees or not' question we get.

It also speaks to opportunity, suitability and perhaps balancing the need to follow forest or grassland guidelines.

BTW – we are working on actually mapping potential grassland areas.

HMHE3 - Grasslands



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



Grassland Habitat Guidelines



Grassland Landscape and Patches

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.



While not a direct comparable overall open cover can be seen like overall forest cover being beneficial. In some studies area-sensitive or affected grassland birds will occupy smaller patches in landscapes with more open patches and/or more open cover.

Patch Size: there are areas sensitive grassland birds: 50 ha and 100 ha meets the needs of the most area sensitive birds with the objective of providing for all area sensitive (and non-area sensitive) birds within those larger patches.

These guidelines are a first venture but hopefully they complement and build open each other to begin to create diverse local grassland landscapes. It also starts moving restoration away from small isolated patches.

Mapping Existing and Potential Grassland Landscapes: Results

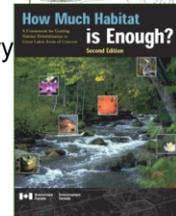
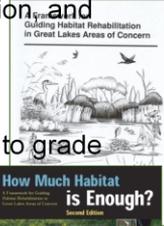


Core focus landscapes

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Does anybody HMHE? yes

- Areas of Concern – literally how much to help set de-listing targets.
- Widely adapted in regional and local land use, restoration, and conservation plans – statutory and stewardship
- Was cited by Environmental Commissioner (ON)
- Use in EAs, EIS by agencies and consultants
- Guidelines included in conservation authority standard to grade watershed health
- Standard conservation primer, used in post-secondary classrooms
- It has evolved into a wider 'framework' for protection, conservation and restoration.



Yes. A lot. [*slide of uses*]

The guidelines have been thoroughly adopted in land-use, habitat restoration, and land securement planning, and with increasing frequency HMHE shows up in the news, classrooms and planning documents. The standard Watershed Report Card used for all southern Ontario watersheds is based on several of the guidelines.

Why do they use it? - resolution

- They are the **right resolution** for the 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.



They are the right resolution for the users. Land use planners in Southern Ontario don't work with species, they work with the green areas on the map – natural cover, habitat if we are lucky.

Why do they use it? -measurable

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



They are **measurable**. For example, you can measure 30% and report on it.

Lessons learned...

[*slide: black or habitat*] So these get used and are actually making a difference...
So what limits are there to these guidelines and to such an approach in general?
Here are observations after 15 years of application.
Some things we need to caution:

Limitations, caveats, cautions habitat is closer than it appears, do not take with alcohol, may cause headaches, may cause drowsiness, ...

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



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Go back to the science, local conditions rule, these are general guidelines

Don't read too much into the guidelines if you are dealing with a local issue or habitat patch.

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There are also **clear limits to prescriptive advice and planning**: guilds such as grassland birds are being far more influenced by agricultural practices and economic trends, and when planning for a sustainable landscape there are competing interests for land. We could put out planning guidelines but not really the answer. There is even an opportunity for **perverse** results: If I tell you not to cut hay one year then it greatly reduces the likelihood you will plant it next year – resulting in a net loss of habitat. For the next edition our major advice will be to restore historic grassland where possible to its original extent. Another is: If I have 30% forest cover can I cut the other 70%? No, it's minimum – 30% is something like your kid bragging about getting 'D's on their report card. So you have to be careful communicating these numbers and know when not to set a number.

Why do they use it?

- **They asked. We listened.**
- *“When do we know when to stop? When will this area be restored? How much habitat is enough?!?”*
- So we answered them



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Why do they use it?

[slide of bolded bullet points] Well first off **they asked. We listened.** This project started in Great Lakes Areas of Concern. These are areas that have various environmental impairments, including lost or impaired habitat. Before you are ‘delisted’ as an AOC you need to restore habitat. So agencies responsible for this restoration asked us and the province ‘How much habitat do we need to restore?’, ‘How much habitat is enough?’ So we answered their question (the government answered their question – write that down)

These are science based guidelines. But these guidelines or any targets are driven by what we choose as individuals and society.

So many times bureaucrats, conservationists, activists and others don’t understand why people – citizens, decision makers – ignore or can’t get their head around science advice.

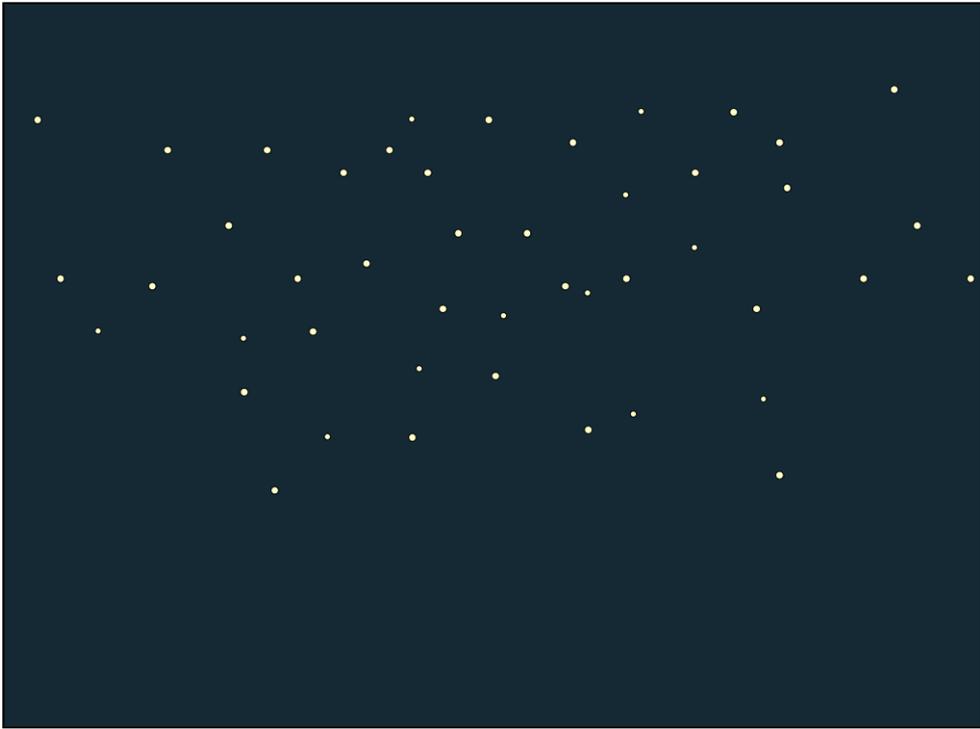
And citizens don’t feel qualified, feel intimidated or feel they lack the technical language to contribute.

But the main reason our guidelines are used are because they are based on simple questions reflecting basic needs – how much is enough? Should I plant trees or not?

We just don't see the entry point to decision making
In fact we are asked questions all the time...



We don't realize that decision makers, the public, our own families ask us questions about nature all the time. Wildlife organizations and agencies are asked how much habitat is enough, how many birds should there be, why are there so many raccoons, how clear should the air be, why should we care about endangered species, what is biodiversity and...



... why can't I look up and see the stars anymore?

We just don't answer these questions And as citizens we don't feel we can ask them. We should ask. And we should listen. Simply and clearly.



Thank-you