

**Manitoba Hydro's Use of
Wildlife Habitat Models**

Dan Soprovich, M.Sc.
Bluestem Wildlife Services

Presentation on Wuskwatim to CEC
March 16, 2004

Hydro's Use of Habitat Models

- Transmission - Habitat Suitability Index (HSI) models.
- Generation - Own models.

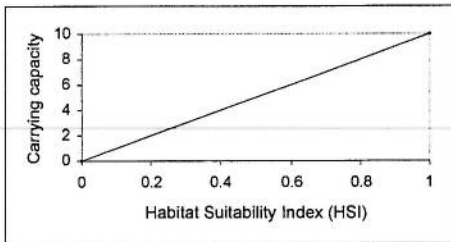
Habitat Model

- Mathematical abstraction of the real world.

Background with Models

- 'Researcher' for Manitoba Natural Resources.
- Regional Wildlife representative on TAC developing Manitoba Habitat Suitability Index models.

Assumed Relationship for Use *(USFWS 1981)*



Manitoba Wildlands Question 326d

- Manitoba Hydro's response.
 - "The absolute nature of the question, with respect to whether the 'model works or does not work' is inappropriate with respect to the application to the HSI models." (lines 12-13, page 1054).
 - "... none of the models will absolutely fail." (line 19).
 - Source: *EIS_RESPONSES_TO_QUESTIONS_COMPOSITE.pdf*

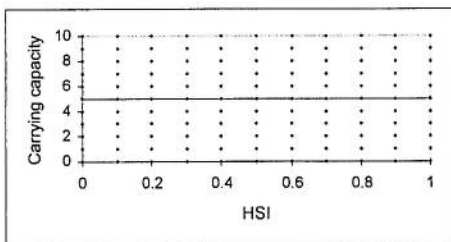
Failure and Success in Habitat Models

Bunnell (1989)

- "One cannot evaluate the success or failure of a design attempt without specifying the demands - what task is the model to perform?"



Random Variation



Older Literature

- **“Many felt that the value of the Habitat Suitability Index (HSI) technology, currently employed by many federal and state agencies, is flawed and of limited use.”** *(Risenhoover and White 1992).*

Recent Literature

- **“... the model is not well suited to predict overall habitat quality in these areas.”** *(Loukmas and Halbrook 2001).*
- **“The unreliable predictive ability of the model tested in this study emphasizes the caution with which HSI models should be applied ...”** *(Rothley 2001).*

Manitoba and Canadian Scientific Expertise

- **“The uncritical application on untested models can be a very dangerous thing. To my knowledge, HSI models are very weak and quite suspect.”** Dr. Albert Bush, Professor and Chair, Department of Zoology, Brandon University. 1999. Personal communication.
- **“Should HSI models really be considered a model that is an important management tool, they must be subjected to the standard rigours required.”** Dr. Mark Abrahams, Associate Professor, Department of Zoology, University of Manitoba. 1999. Personal communication.

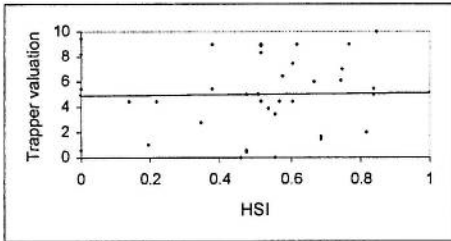
- "... as you assert, the repeated failure of such models to map into observed differences in abundance across habitat of markedly different quality raises legitimate concern." Dr. James Hare, Assistant Professor, Department of Zoology, University of Manitoba. 1999. Personal communication.
- "... Most of these tests fail." and "Generally, I am not supportive of HSI as an approach to forest management. However, in the absence of other more elaborate tools, it is an approach that can work as one component of a forest management program ... if the models predict correctly." Dr. Ian Thompson, Research Scientist, Canada Forest Service. 1997. Personal communication.

**Manitoba Wildlands
Question 326a**

- Manitoba Hydro's response.
 - "Evidence to support the statement that the models 'do not work' is not available." (line 11, page 1048).
 - Source: *EIS_RESPONSES_TO_QUESTIONS_COMPOSITE.pdf*

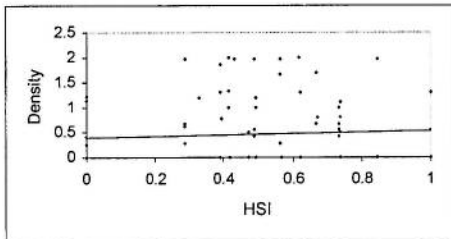


Test of Manitoba marten HSI model

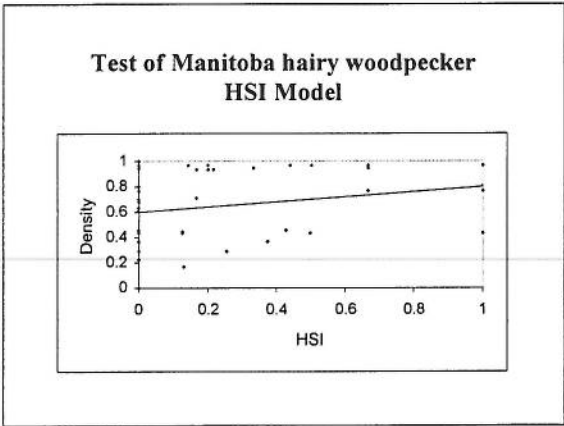


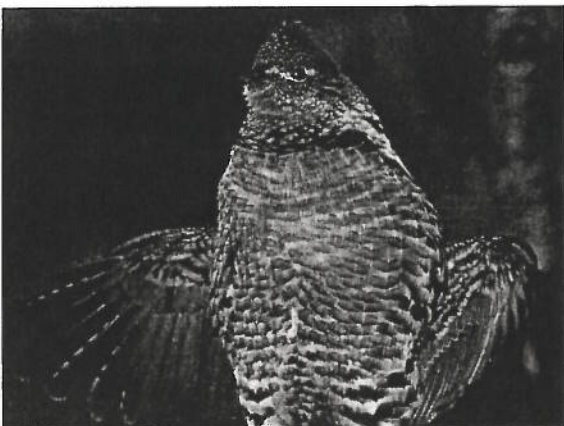


Test of Manitoba black-and-white warbler HSI model

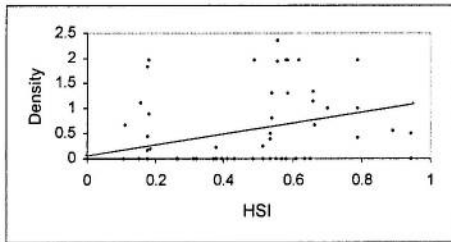








**Test of Manitoba ruffed grouse
HSI Model**



The Use of Untested Models

- “We strongly discourage the use of untested models because they lack credibility.” (*Laymon and Barrett 1986*).
- “These authors recommend that models should not be applied for management purposes until their predictive accuracy has been established for local conditions.” (*Berger and Ehnes 1997*).

**Manitoba Conservation
Implicit/Explicit Rejection of HSI Models**

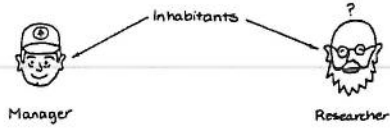
- Woodland caribou. Northwestern Region. Mr. Kent Whaley. 2004. Personal communication.
- Moose. Western Region. Mr. Greg Carlson, Mr. Peter Hildebrand. 2003. Personal communications.
- American marten. Wildlife and Ecosystem Protection Branch. 2004. Mr. Dean Berezanski. Personal communication.

Why Have The Manitoba HSI Models Failed?

- Process problems.
- Limitations of the 'driving' variables.

Process - No 'Researcher'

Bunnell (1989)



Process Problems

- Modelling team lacked 'Researcher'.
- Failure to examine scientific literature.
- Lack of relevant local data.
- Transferability of scientific literature.
- Investment of expertise and resources.

Driving Variables

- Level of detail.

Burned Forest



Logged Forest



White spruce Understory



**Manitoba Hydro Wuskwatim
Generation Project**

'Trust Me' 'Science'

Summary

- Scientific literature indicates failure of HSI models.
- Manitoba scientists and other Canadian experts recognize failure, and caution against the use of HSI models.
- Hydro view of model failure 'out of touch'.
- Use of the HEP method requires that model relationship be linear and through the origin.
- Hydro ignored evidence of tests of Manitoba HSI models.

Summary, continued

- Hydro applied untested HSI models.
- Implicit and explicit rejection of HSI models by Conservation staff.
- Reasonable evidence to explain why the HSI models might fail.
- The Generation project assessment - 'Trust Me' 'Not science'.

Conclusion

- Reject the findings of Manitoba Hydro's assessment of the Transmission and Generation Projects, with respect to their use of habitat models.

Why Am I Here?
