Grassland Vegetation Inventory (GVI) Resource Selection Function Development

Introduction

The greater short-horned lizard is the only lizard to occur in Alberta and is only found in the southeast corner of the province.

They are approximately 40mm to 70mm in length.

There are a number of subpopulations that appear to be decreasing, although individual subpopulations appear to be stable.

It is found in badland habitat and associated sparsely vegetated coulee slopes.

It is legislated as endangered in the province, meaning it might be headed towards extirpation.

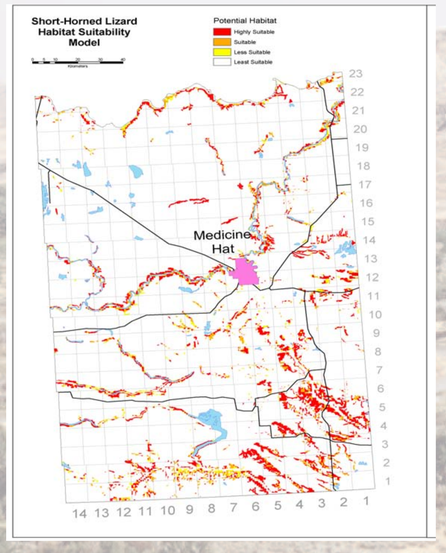
Young of the year are only the size of a penny

The orginal Habitat Suitability Index (HSI) for the short-horned lizard was developed along with a suite of models for other species to assist MULTISAR in prioritizing areas to focus stewardship activities.

The original model was based on a literature review and expert opinion. The model contained only four variables:

- topographical features - distance to valley
- Native Prairie Class
- Elevation
- Riparian Zones

It was mapped at the quarter section level.



Original HSI Model

Resource selection functions (RSFs) are a conservation tool being utilized by MULTISAR as an alternative to Habitat Suitabilty Index (HSI) models.

Where resources are defined as any abiotic or biotic factor directly used by an organism (Morrison 2002), a RSF is defined as a function (i.e., statistical model) that estimates the probablilty of use of a resource (Manly et al.2002)

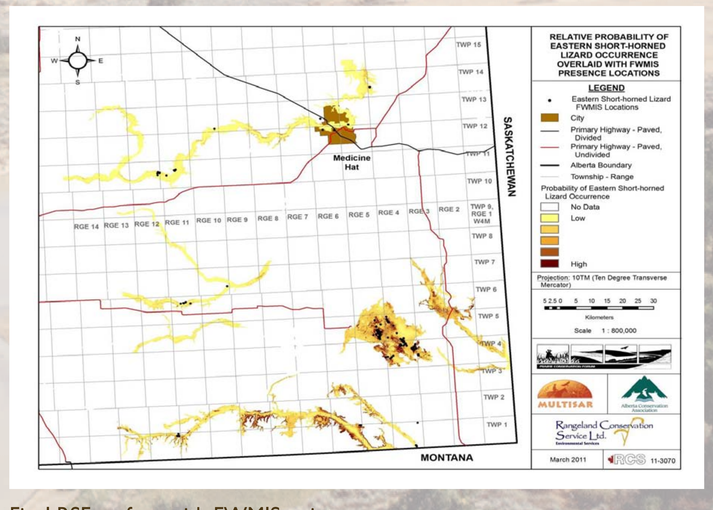
RSF models are derived using empirical data as opposed to the expert opinion based HSI models.

RSF model derived using location data for short-horned lizards contained within the Fish and Wildlife Management Information System (FWMIS)

The model consisted of eleven variables:

- Distance to Badlands site type
- Distance to Loamy site type
- Distance to native upland
- Distance to riparian areas
- Distance to fluvial deposits
- Percent non - vegetation cover
- Percent grass cover
- Percent shrub cover
- Elevation
- Aspect (northness and eastness)

* 7 variables (in red type) were derived from the GVI dataset



Final RSF surface with FWMIS points

What is MULTISAR?

The MULTISAR conservation program is a cooperative initiative between the Alberta Conservation Association (ACA), Alberta Sustainable Resource Development (ASRD), and the Prairie Conservation Forum (PCF).

Multisar collaborates with landholders to maintain and enhance species at risk habitat in Alberta's Grassland Natural Region.

MULTISAR utilizes cost-effective tools to help conserve species at risk.

MULTISAR funding partners include:

The Government of Canada
Habitat Stewardship Program
for Species at Risk

Conclusions

- The original HSI model for the short horned lizard relied on habitat information contained in the Native Prairie Vegetation Inventory (NPVI). NPVI is quarter section based and does not split native prairie and riparian areas into their respective site types.
- Wildlife species select for very specific site types, which are not available in coarser datasets. The RSF model developed for this project was much better at predicting short-horned lizard occurrence because of the detail contained in the GVI dataset.
- The increased number of variables and the finer resolution of the GVI dataset allowed for the development of a better model.
- This RSF modelling approach improves the performance of models over the HSI approach and provides a better suite of tools to government and conservation orgainizations to help conserve species at risk.

References

Manly, B.F., McDonald, L.L, D.L. Thomas, T.L. McDonald, and W.P. Erickson. 2002. Resource Selection by Animals: Statistical Design and Analysis for Field Studies. Second Edition. Kluwer Academic Publishers. New York, NY. 221 pp.

Morrison, M.L. 2002. Wildlife Restoration: Techniques for habitat analysis and animal monitoring. Island Press. Washington, DC. 209 pp. U.S. Fish and Wildlife Service. 1995. North Dakota's federally listed endangered, threatened, and candidate species 1995.