



# **Landscape Pattern: Targets and Thresholds**

## ***-Some Ideas-***

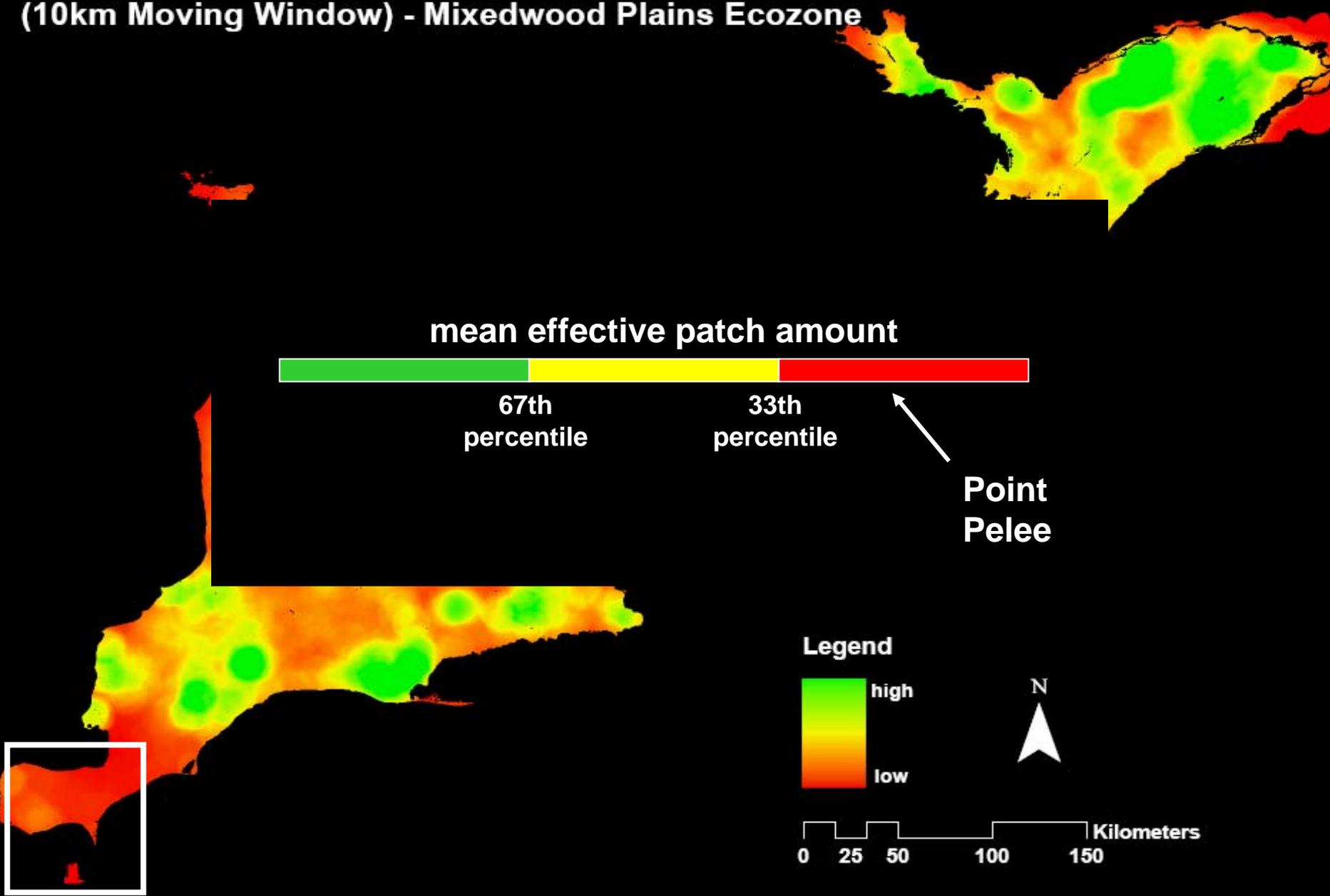
***Paul Zorn, Justin Quirouette, Donald McLennan,  
and Stephen McCanny***

***-Parks Canada-***

## Spatial Reference

- Compare park or GPE to the natural region it is supposed to represent.
- Across the whole natural region is your park or GPE relatively fragmented or connected with respect to an ESLI?

# Deciduous Forest Birds Profile - Relative Amount of Interior Forest (10km Moving Window) - Mixedwood Plains Ecozone



## Issues - Spatial Reference

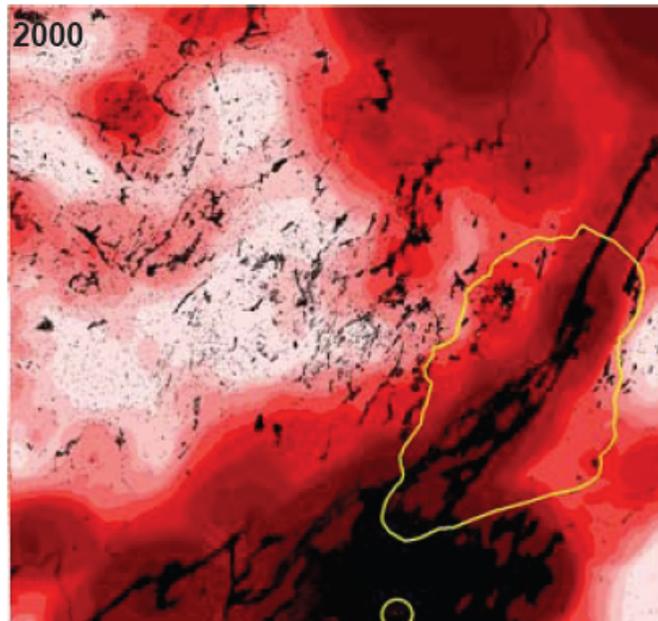
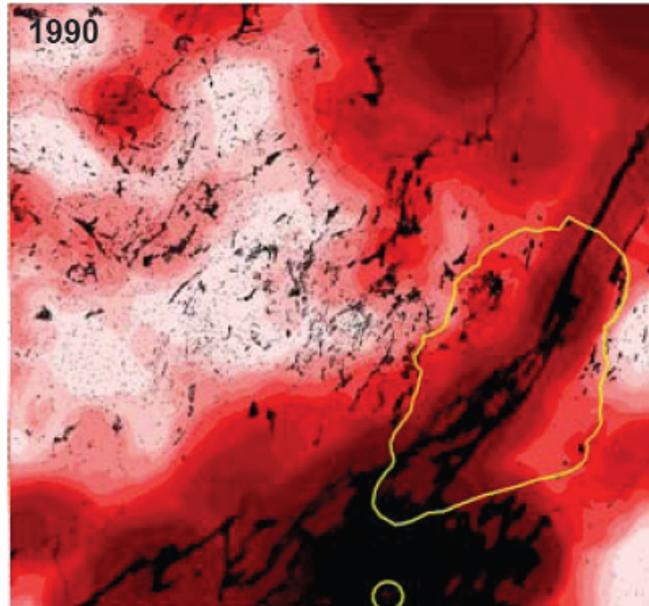
- Easy to do. Very operational.
- Easy to communicate.
- Problem with sliding baselines.
- Possible inappropriate comparisons.

# Temporal Reference

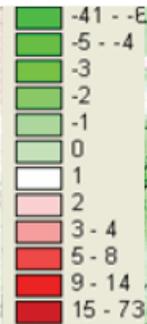
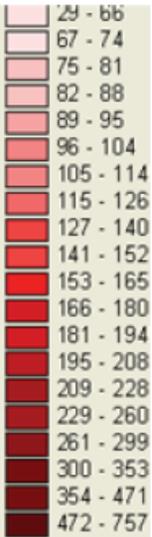
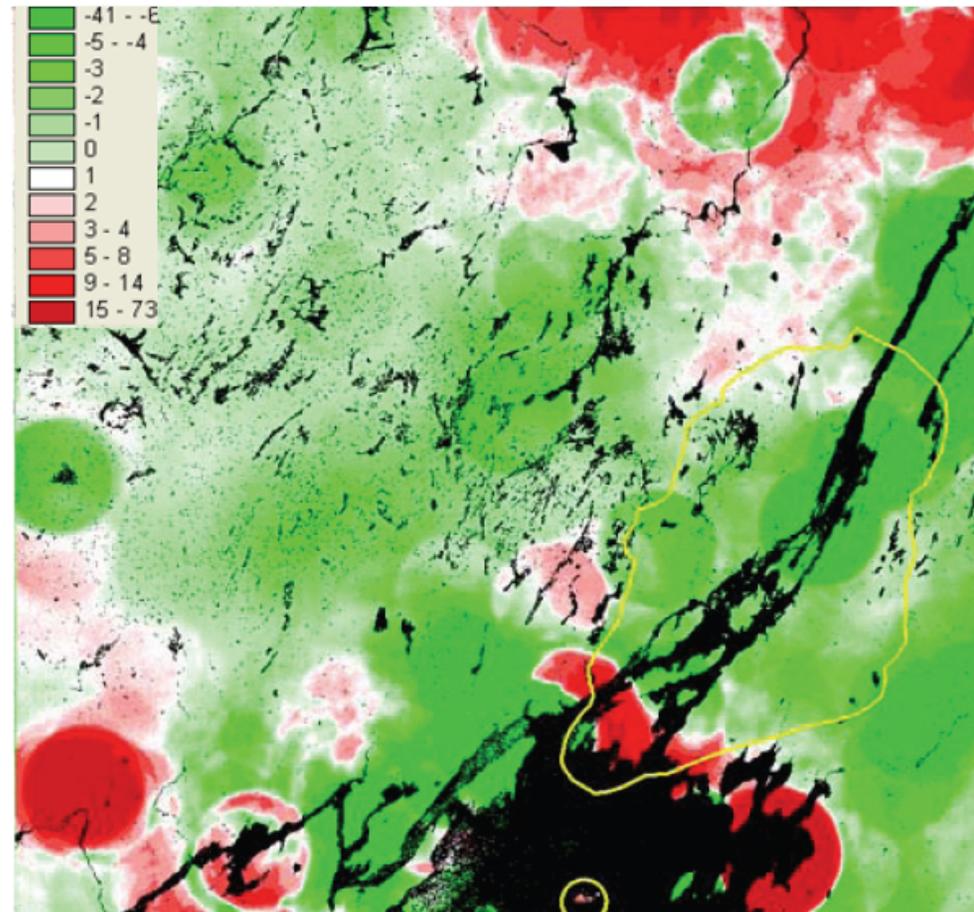
- Change detection in landscape pattern from a consistent time series of RS data.
- Direction and magnitude of change.
- How has your park or GPE changed over time?

# SLI NP Hardwood Forest Birds Profile

## Habitat Connectivity MWA for 1990 and 2000



2000 MWA - 1990 MWA  
(Red areas indicate where deciduous  
habitat connectivity is decreasing)



## Issues - Temporal Reference

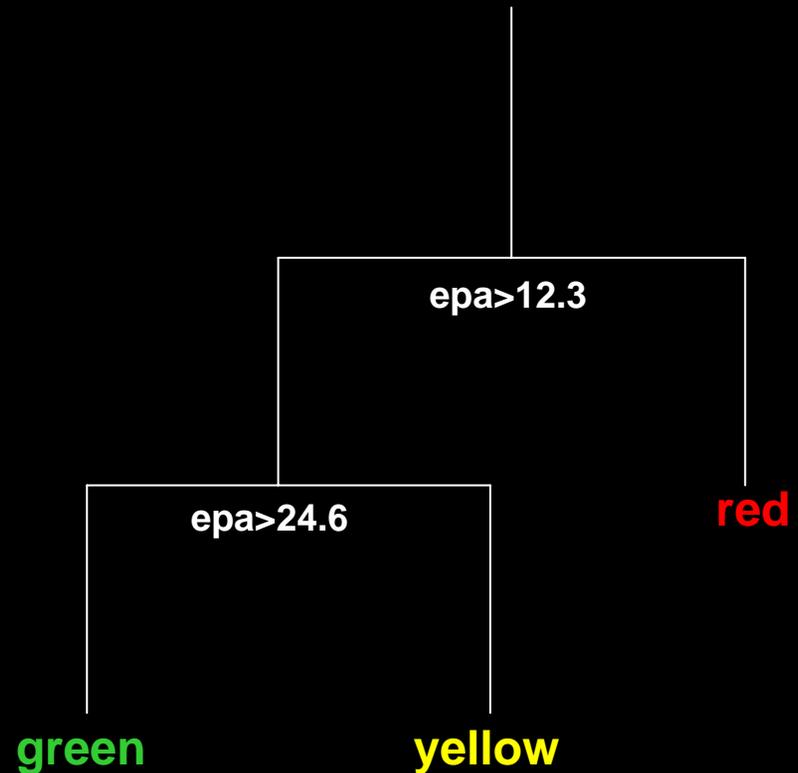
- Expensive or impossible to get time series of RS data.
- Can do simple time series or statistical process control analysis to identify thresholds (eg, standard deviation intervals) but ecological interpretation still needed.

## Cluster or Tree Models

- Calibrate landscape patterns with species abundance data.
- How does species abundance respond to patterns of landscape fragmentation?

# Classification Tree

- Three clusters representing “red”, “yellow”, “green”. (k=3)
- Abundance data as response variable.  
Landscape pattern data as predictor.
- Tree models useful with binary splits.



## Issues - Cluster or Tree Models

- More data intensive.
- Abundance data not always available but often is (eg, forest birds).
- Provides linkage between landscape pattern and species abundance (ecological interpretation).

## Spatially Explicit Population Viability Analysis

- Use PVA to determine relationship between landscape pattern and species' vital rates / likelihood of extinction.
- Brings alot of ecological information to the table.
- Data quality and quantity an issue.
- Error propagation an issue.

# Others?

- What is the level of resolution you really need (red, yellow, green)? If resolution is coarse then some error is acceptable.
- What are the consequences of different kinds of error?
- How risk averse are you? What is your comfort level across measures? (management & science considerations)
- Adaptive management approach using precautionary principle. “Protocol” for threshold review and refinement.