Identifying Environmentally Significant Areas in Alberta Using a Systematic Conservation Planning Framework

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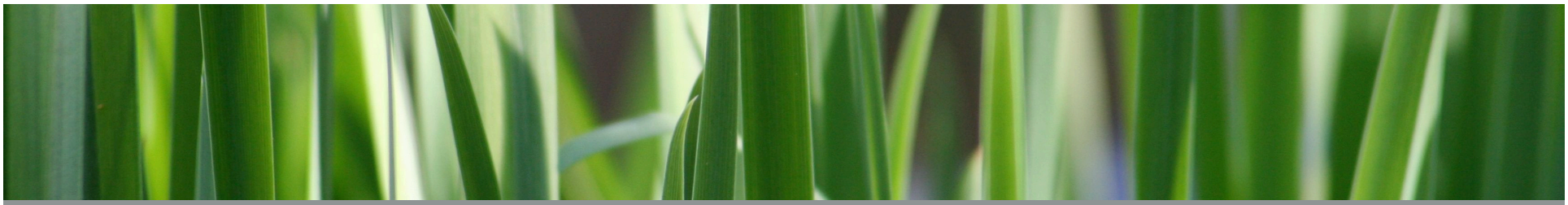
Biological Conservation – The What

"The aim of conservation in the biological sense is to ensure the continuing existence of species, habitats and biological communities, and the interactions between species, and with ecosystems"

(Spellerberg 1996)

Biological Conservation – The Challenge

- Traditional conservation planning has been plagued by "uninformed opportunism"
  - Economic values supersede biological values
  - Protected area networks are not representative, and do not support critical ecological patterns or processes needed for biodiversity persistence



Systematic Conservation Planning (SCP)

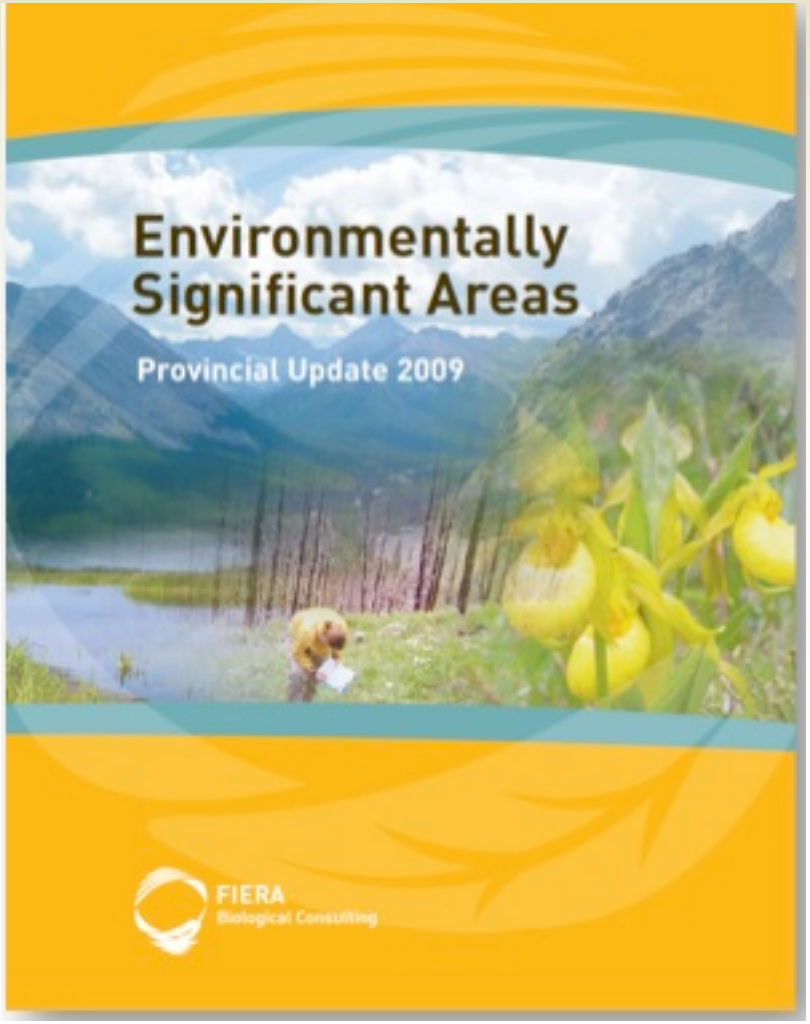
- A process of identifying candidate areas for conservation or alternative management in a way that integrates biodiversity with economic, social, and cultural considerations in multifunctional landscapes

(Margules and Pressey 2000)

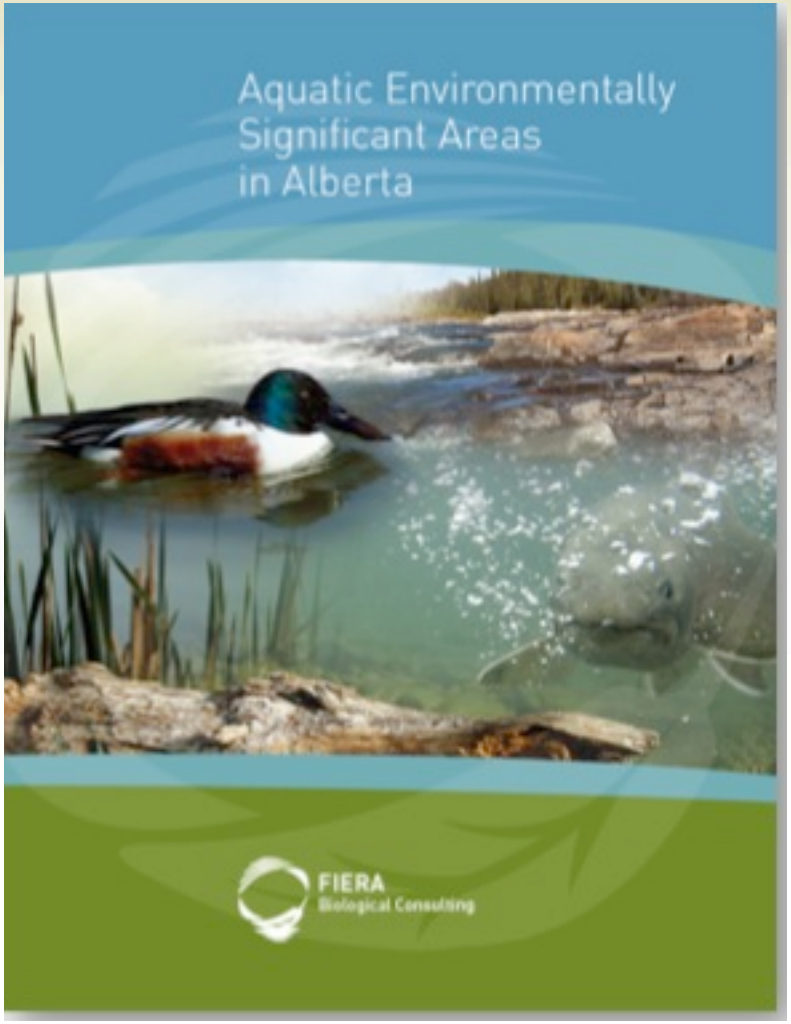
Framework for SCP

1. Identify conservation targets (criteria & indicators)
2. Define planning unit, collect information and identify gaps
3. Set quantitative conservation goals
4. Assess existing conservation area network (gap analysis)
5. Prioritize potential conservation areas: degree of existing protection, conservation value, irreplacibility, risk, feasibility
6. Implement conservation action

Conservation Planning in Alberta



http://www.tpr.alberta.ca/parks/heritageinfocentre/environsigareas/default.aspx



http://environment.gov.ab.ca/info/library/8392.pdf

ESA & AESA Planning Framework:

Step 1: Objective Setting → Set objectives that are relevant to the planning exercise

Step 2: Criteria Building → Develop *a priori* criteria & indicators to meet management objectives

Step 3: Data Acquisition

Step 4: Parameter Building

Step 5: Spatial Modeling

Step 6: Decision-making

Criteria:

- Conditions or processes that characterize the environment
- Often narrative and aspirational, but can also be numeric

Indicator:

- Measureable trait that is used to observe, evaluate, or describe trends as criteria change over time

ESA & AESA Planning Framework:

Step 1: Objective Setting	Set objectives that are relevant to the planning exercise
Step 2: Criteria Building	Develop *a priori* criteria & indicators to meet management objectives
Step 3: Data Acquisition	Acquire & build spatial datasets for use in the model
Step 4: Parameter Building	Develop “rules” for the systematic application of criteria using available data
Step 5: Spatial Modeling	Run spatial model to acquire map outputs
Step 6: Decision-making	Prioritize areas for conservation or management

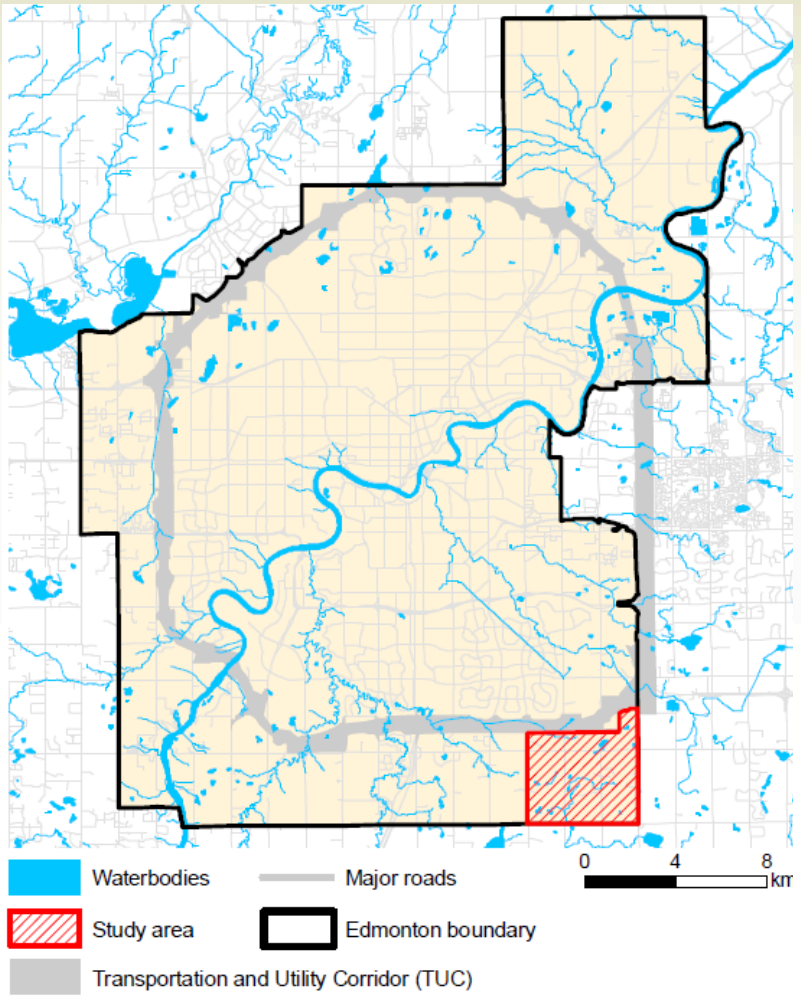
Aquatic ESA Criteria

1. Presence of aquatic focal species, species groups, or their habitats
2. Presence of elements of environmental concern
3. Presence of rare or unique aquatic ecosystems
4. Key areas that contribute to water quality
5. Key areas of biological connectivity
6. Key areas of intact complexity and/or biodiversity
7. Key areas that contribute to water quantity

Conservation Planning in Edmonton

Project Purpose

Identify candidate lands in SE Edmonton for integration into existing ecological network using SCP framework



Biodiversity Value Index (BVI)

Criteria:

1. Site Condition:
   A) Intactness (amount of human disturbance in natural area)
   B) Amount of core habitat (areas ≥25m from natural area edge)
   C) Amount of human footprint (in 100m buffer)
2. Ecosystem Diversity
3. Ecosystem Value (representation of rare ecosystem types)
4. Remnant Patch Size (size thresholds)
5. Connectivity:
   A) Number of wildlife corridors
   B) Degree of fragmentation surrounding natural areas

Biodiversity Value Index (BVI)

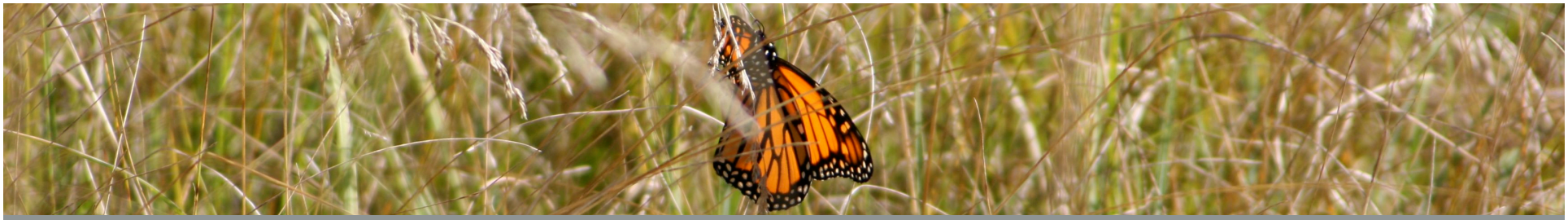
Each of the 5 criteria were:

- Converted to values between 1-4 (quartile distributions)
- Summed to calculated the overall BVI ranging between 1(Low) and 4 (Very High)

Prioritization

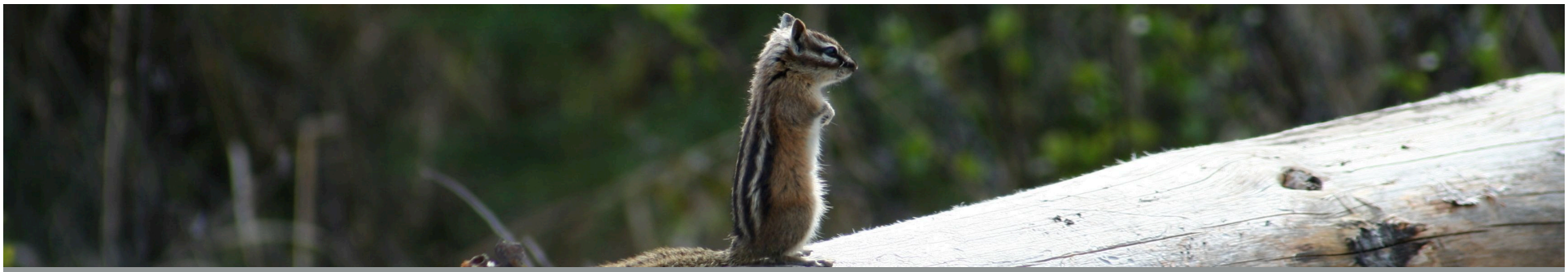
1. Land Area Targets:
    - 2%, 4%, 8% of the study area protected, PLUS areas identified as Environmental Reserves (ER)
    - 2%, 5%, 10% of the study area protected, INCLUDING areas identified as ER

2. "Cost" Scenarios:
    1) Distance to protected areas
    2) Distance to linkages (i.e. power lines, hedgerows)
    3) Distance to future road arteries



Conclusions

- The Systematic Conservation Planning framework is flexible, transparent, and scientifically defensible
  - Can be applied at multiple spatial scales
  - Process can be designed to engage multiple stakeholders
- Integrates social and economic considerations to prioritize areas where conservations efforts will have the best outcomes



Questions?

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