Economic Incentives for Sustainable Forest Management

Project Team

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- Alberta Environment
- Sustainable Resource Development
- Environment Canada
- Little Red River Tall Cree
- Ducks Unlimited Canada
- Canadian Boreal Initiative

Outline

- Overview of Incentives for SFMN
  - Background and AB Context
  - Role of economic instruments in cumulative effects management
- Proxy Markets for Conservation Services
  - Tradable Permits, Baseline and Credit Programs, and Offsets
- Design and Implementation Challenges
  - Setting objectives and defining rights, initial allocation, trading rules
  - Governance, equity, aboriginal rights
- Lessons Learned

Background

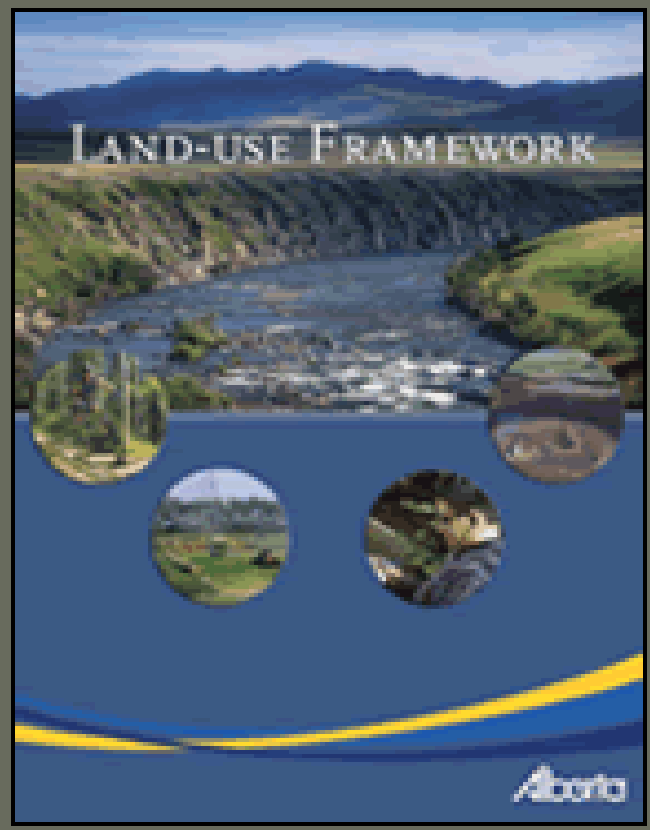
- Most of AB's forest allocated in FMAs/FMUs
- AAC calculated without attention to fire or energy sector impacts
  - In 1999 the total harvested area for industrial roundwood = 42,210 ha.
  - Between 1995 and 2002, the average annual area cleared by the energy sector = 47,000 ha
- Reclamation Deficit
- Problem throughout Western Sedimentary Basin

Need for new approaches …

- Project Specific Approvals versus Cumulative Effects
- Move towards threshold based land management plans
  - Deh Cho (NWT); Muskwa-Kechika Management Area (BC)
  - Alberta Land Use Framework
- How to translate objectives into project specific approvals and requirements
  - Zoning can lead to significant political lobbying
  - Fairness and cost effectiveness?

The Alberta Context

- **Land Use Framework Conservation and Stewardship Tools**
  - "Cumulative effects management will be used at the regional level to manage the impacts of development on land, water and air."
  - identify and develop a toolkit of new best practices, market-based approaches and incentives to provide ecological goods and services;
    - Tradable Disturbance Rights (TDRs)
    - Land conservation offsets
  - ***Alberta Land Stewardship Act*** **(Bill 36)**



http://www.landuse.alberta.ca/documents/Final_Land_use_Framework.pdf

Institute for Agriculture, Forestry and the Environment

- The IAFE's mandate is to catalyze and coordinate the development of a policy framework that harness market forces to improve environmental performance in the renewable resource sector. It has four strategic mandate areas:
  1. **Develop a Conservation and Stewardship Strategy**
  2. **Market-Based Approaches for Environmental Stewardship**
  3. **Documenting Environmental Integrity**
  4. **Innovation**

What are Market Based Instruments (MBIs)

- Policy instruments that use price or other economic variables to provide incentives to manage for the environment.
  - encourage an environmental improvement where there are private costs to land managers but greater public benefits
  - discourage environmental degradation when there are private benefits to land managers from damaging practices but even greater public costs
- Price Based Incentives
  - taxes, charges, subsidies
- Quantity Based Incentives (Proxy Markets)
  - Tradable Disturbance Permits
  - Offsets

http://www.marketbasedinstruments.gov.au/

When are Proxy Markets Appropriate?

- Large variations in the ability and cost-effectiveness of actions by firms to provide the desired conservation outcome.
  - market instruments can be used to reveal cost-effective opportunities
- Flexibility in the range of responses that will deliver the desired outcome;
- Scope for innovation in improving land management outcomes.
- There is a known, established and enforceable objective, target, threshold

Variability Costs and Effectiveness of Action

- Forest Sector
  - Change timing and pattern of block layout
  - Coordination on roads, etc. (Integrated Land Management)
  - Site heterogeneity of stand values (age, site quality, distance from mill, etc.)

Variability in Costs and Effectiveness of Action

- Energy Sector
  - Examples of Best Practices
    - Reducing the width of seismic lines
    - Reducing amount of roads per well
    - Increasing the number of wells per pad
    - Overlapping seismic, road and pipeline corridors
    - Reclaiming disturbed land faster
  - Best practice options and impacts are resource/site specific.

Requirements of Quantity Based Systems

- A quantitative environmental performance target to be achieved individually or collectively
  - a maximum ceiling on activity
  - a minimum performance commitment
- A defined spatial and temporal flexibility.
  - Requires a well defined environmental equivalence to enable transfers of permits
- Monitoring and Verification System

Tradable Disturbance Permits

- Cap Annual Forest Disturbance (ha/yr).
  - Permits issued for use in a given year (grandfather/auction)
- Firms must hold permits (TDPs) for forest disturbance
- Permits can be traded between sources.
- In theory reduction of disturbance occurs in areas where it is most cost effective

Baseline and Credit Program

- Source Based Standards (best practices)
  - E.g. linear footprint or area per well pad
- Firms can sell credits created for impacts below standard
- Firms can purchase credits required if above standard
- Based on intensity limit rather than aggregate cap

Offset Program

- An offset is a positive action to compensate for the negative environmental impacts associated with development.
- Associated with No-Net Loss or Additionality Requirements
  - E.g. Firms required to maintain certain amount of undisturbed forest on the landscape
  - Firms can ‘buy back’ allocations or create credits through reclamation/restoration to meet this target
- Environmental outcome depends on definition of ‘equivalence’

Evaluation Criteria

- Environmental Effectiveness
- Cost Effectiveness
- Economic Efficiency
  - maximizing benefits/minimizing cost;
- Administrative Feasibility; and
- Equity and stakeholder acceptability

Program Characteristics

	Cap and Trade	Baseline and Credit	Offset
Program Goal	Disturbance Threshold	Encourage Best Practices	No Net Loss
Definition of the Good	Amount of Disturbance	Amount of Disturbance	Ecological Equivalent
Property Right	Allowance	Allowance	Obligation
Spatial Dimension	X	X	Y
Baseline Requirements	X	Y	Y
Fungibility	H	M	L

Design Options

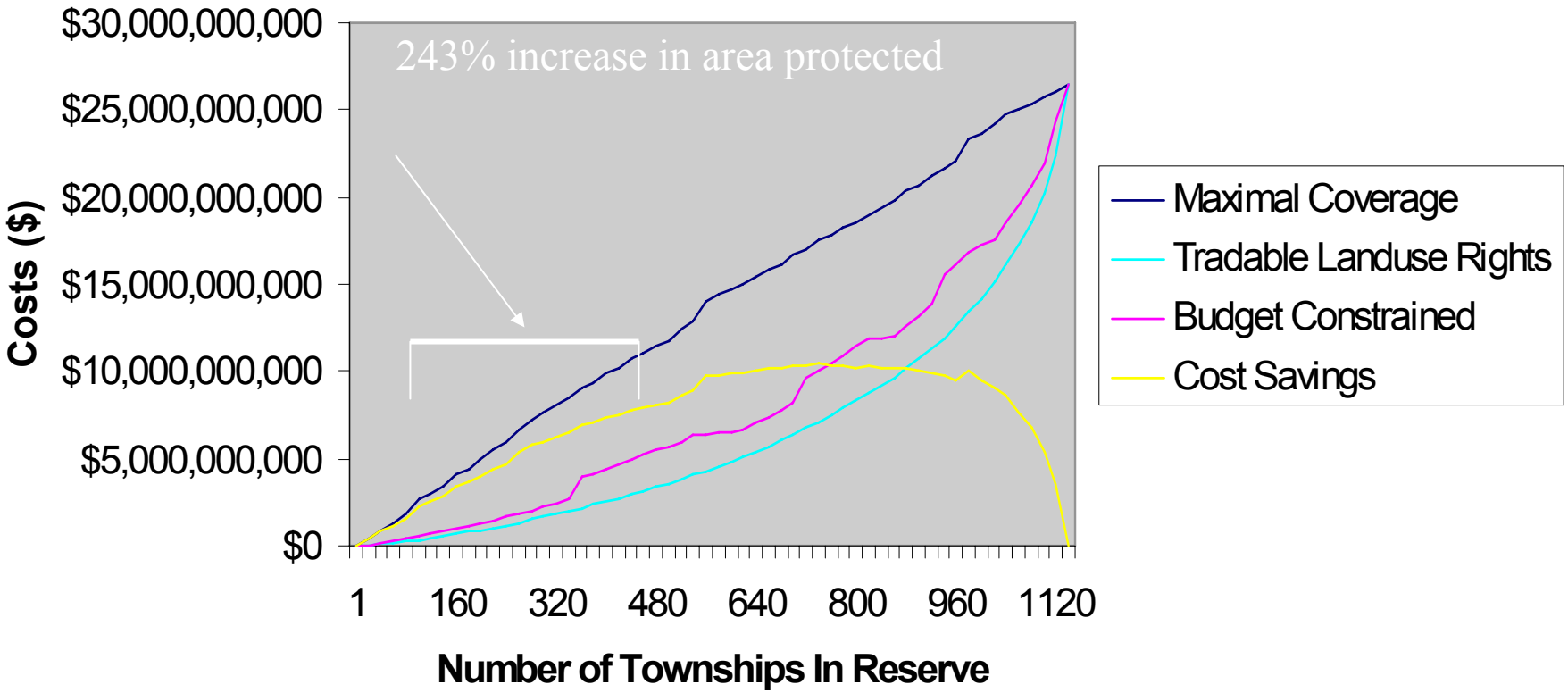
- Setting Objective and Cap
- Initial Allocation
- Banking
- Market Institution

Design Options

- Setting Objectives and Defining Right
  - Instrument = Coarse Filter
    - Old Growth, All Disturbance, Zoning (ecologically sensitive areas?)
  - How does the coarse filter relate to biodiversity objectives
  - How to incorporate successional dynamics and shifting habitat features into conservation objectives and TDPs;
  - Tradeoffs between spatial and non-spatial aspects of biodiversity conservation;

Design Options

Figure 1. Opportunity Costs Under Alternative Reserve Selection Algorithms

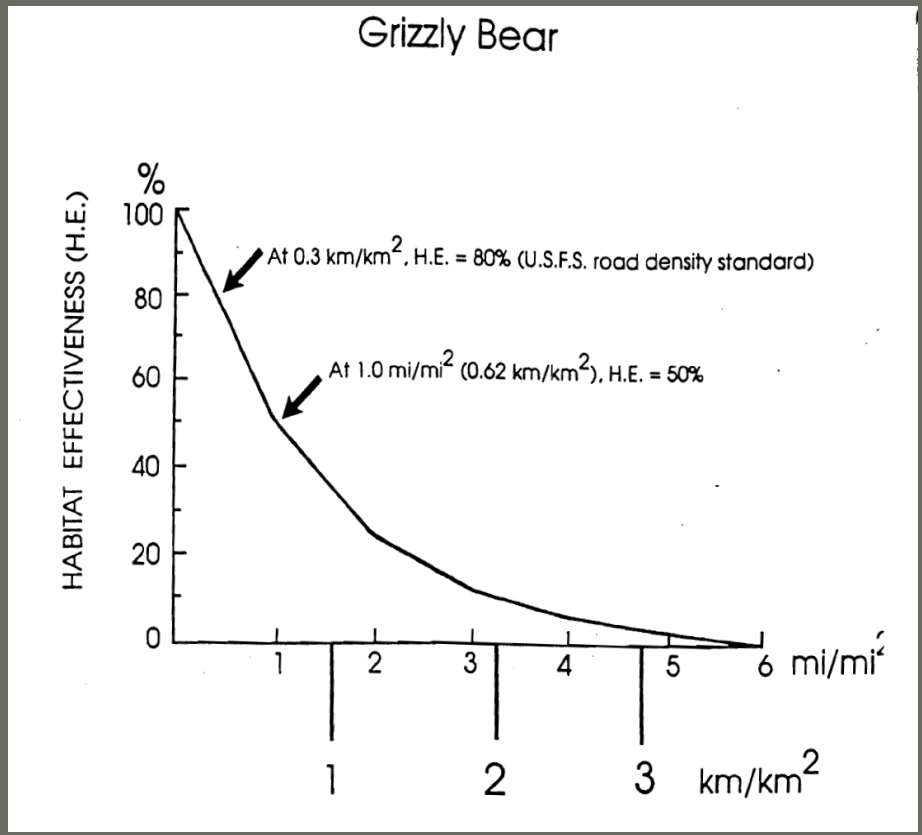


Design Options

Table 2. Outcomes Under Alternative Reserve Selection Approaches

Approach	Land Constraint	Cost ($M)	Biodiversity Index
MC	140 twps (~12%)	$3,410	.076
BC*	173 twps (~15%)	$807	.076
TLR	140 twps (~12%)	$555	.056
TLR	200 twps (~18%)	$917	.081
TLR	480 twps (~42%)	$3,340	.195
MC	380 twps (~34%)	$9,360	.190

Design Options



- Dose Response Functions for species of mammals, fish, birds
- Integrated Indices such as Biodiversity Intactness underway

Source – AEP 1998

Design Options

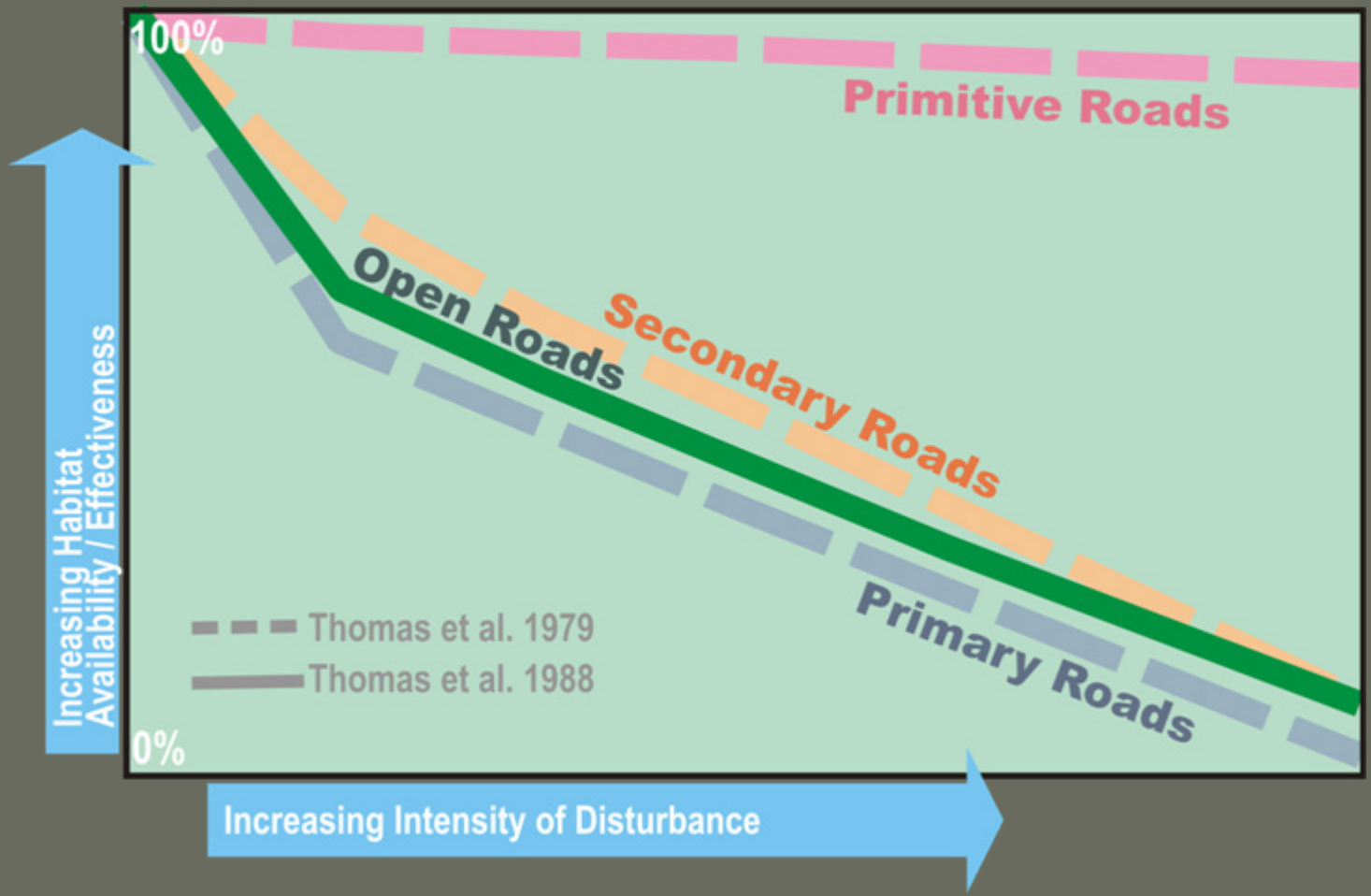
Indicators and Thresholds (Draft Dehcho Plan)	**Possible to reduce to habitat credit?**
Caribou, Grizzly, Moose, Marten - Cleared area (<10%) - Corridor and road density (<1.8 km/km^2, or <0.6 km/km^2) - Minimum patch size and core area (>65%) - Stream crossing density (<0.5/km^2)	**Yes for all!**

Design Options

- Most features vary in impact and duration
  - Linear Features
  - Roads
  - Mining
  - Cutblocks

- How can we make these “commensurable”

Design Options



Actual Dose Response

Design Options

Initial Allocation/Market Institution

- Grandfathering
  - Permits grandfathered based on historical rights/use
  - Firms trade *on an open market*
  - Firms trade permits *on a sealed market*
- Government Auction
  - E.g. Sealed bid (e.g. used in government tenders or timber sales)
  - Revenue Neutral – revenue redistributed back to firms based on proportional share of timber

Design Options

- Major difference between market institutions is in control over the permits
  - Affects the efficiency, environmental, and distributional consequences
  - Double Auction and Call Market are equivalent to an offset market (trading entitlements)
  - In the case of tender auctions firms cannot hold back permits

Implementation Challenges

- Governance challenges and policy barriers
  - Distributional and equity issues
  - Overlapping tenures and coordination between industrial sectors
  - Aboriginal treaties and rights

Implications of Aboriginal and Treaty Rights

- Land based rights affirmed by treaties include rights to hunt, trap, fish, and gather
- R. vs. Sparrow (1990)
  - Establishes tests for duty to consult and compensation
  - TDP and offset approaches could reduce transaction costs associated with project-by-project, site-by-site consultations for Aboriginal communities.
  - Duty to consult implies participation by Aboriginal peoples in the design of the market
  - Could allocation of permits or rights to sell offsets to Aboriginal Communities address accommodation and compensation?

Conclusions

- MBIs may be a fair and cost effective way to manage cumulative effects and meet regional land use targets on public land;
  - No examples of MBIs applied on public land
  - Overlapping tenures and cross-sector challenges
  - Consistent with public land dispositions
  - More work required to understand tradeoffs amongst design options (e.g. defining objectives, disturbance thresholds, and allocation options)

Conclusions

- Initial allocation and trading rules affect outcomes.
  - Need to be clear on why choosing which institution
  - How will market interact with current tenure and regulatory systems for managing resources
- Direct participation by Aboriginal peoples in the design and regulation of any market will be critical to success

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