

Economics and Environmental Policy Research Network

Research Symposium

October 29th – 30th, 2018

Session Notes for Plenary I: Protected Areas and Species at Risk

1. Context of Discussion

This session sought to identify research gaps and make recommendations for future research to improve protected areas and species at risk policy design, regulation, economic analysis and evaluation. The significance of natural resources to Canada's economy poses a challenge to conservation that will require coordinated effort among scholars and policymakers. It was noted that Indigenous engagement and reconciliation must remain a continuous theme throughout any discourse on nature conservation.

Highlighting the frontier of current research in this area, the presentations in this session looked at two main thematic areas:

1. **An examination of the US Endangered Species Act (ESA), focusing specifically on economic lessons learned when it comes to the listing of species and the effectiveness of the ESA.** Key points highlighted included

- The observation that despite the ESA clause which specifies that listing decisions are to be made based solely on ecological factors, non-scientific factors have evidently been considered in listing and have played a substantive role in listing and expenditure decisions. Many listing decisions have been found to be affected by socioeconomic and political factors such as the political mood, species charisma, accounting costs of recovery, and historical or ceremonial use of species.
- Costs of the ESA can increase very rapidly at high levels of conservation, with critical habitat designation found to have impacted housing prices and welfare. The evidence on costs of federal agency consultations with the Fish and Wildlife Service is inconclusive. There is no rigorous empirical evidence that consultation requirements for federal agencies have stopped or substantially altered projects, but some anecdotal evidence suggest significant project modifications and large economic impacts.
- Because most critical habitat in North America lies on private lands, economic incentives to private landowners are essential to conservation (2/3 of listed species occur on private land). However, perverse incentives that encourage the destruction of habitat to avoid future regulation or decreased value of development are widespread. There is much room for policy initiatives to counteract perverse incentives with positive ones—so far, these include mainly compensation and regulatory assurance, which have been found to effectively contribute to recovery and survival.
- Finally, measuring the effectiveness of ESA remains controversial. Studies that measure effectiveness based on the trend in recovery tend to portray the ESA as ineffective, as very few species achieve are delisted (currently, only 47 species have recovered enough to be

delisted). However, the act has been effective in preventing extinction/extirpation of species, which demonstrates that a more realistic effectiveness measure could focus on the number of species whose status has improved (e.g. from endangered to threatened).

2. **An exploration of how to value natural capital in the market and how this contributes to natural capital provision and ecosystem management.** Although challenging, natural capital can be valued symmetrically with traditional capital, allowing it to be treated quantitatively. Wildlife can be treated as analogous to stock. The value of such stocks in turn affects human behavior in the form of management decisions, which impacts how the stock evolves over time. Thus it is possible to use the relationship between resource stocks and behavior change to measure the effects of human-wildlife interaction and inter-species ecological interactions. Looking at some tangible examples, asset prices have been shown to increase in value with improved management. For instance,

- Better management institutions increase the value of the fish in the Gulf of Mexico, with the value of management institutions capitalized through asset prices.
- In a study of groundwater in Kansas, the actual allocation of resources demonstrated that assets are worth more than the values we assign them intuitively. From a policy perspective, this led Kansas farmers to conclude that they needed to do better water conservation.
- Additionally, in the Baltic Sea, ecosystem-based management led to a 30% increase in asset values, compared to single-species efforts. These prices reflect the interaction of species within an ecosystem, including the economic and ecological substitutability and complementarity of species which define their relationships.
- Looking at Caribou in Alberta, estimates suggest that Alberta would need to maintain its current conservation program and supplement it with a compensation fund of \$400 million. This example considered traditional seismic lines as a function of the caribou stock. The asset price curve obtained implied that the value of a marginal caribou is 80,000 CAD, with stated preferences consistently two orders of magnitude greater than revealed. If the revealed value of a marginal caribou is low, that value can be increased with increased stewardship.

These examples demonstrate that it is important to view these different conservation efforts as investments which capitalize through the assets.

From a policy perspective, the following points were (re-)emphasized:

- The crucial role that economics plays in the rigorous analyses that underlie conservation decisions. Policy makers must consider the implications for different industries, the justice of disproportionate impacts on population groups (e.g. gender-based analysis), and the socio-economic impacts on Indigenous Canadians.
- The need for more multi-disciplinary work in conservation.
- The increase in value derived from utilizing more multi-species approaches.
- The need to carefully consider policies which can create perverse incentives.
- The need to find a right way to measure success for conservation efforts.
- The need to be aware of the shortcomings of cost benefit analyses in the context of species at risk e.g. costs are crucial to the analysis, but embody many uncertainties such as how land value changes over time. Estimation of benefits tied to a specific regulation is hard to do, and often draws on non-market valuation methods such as travel costs or stated preference,

which are challenging to apply in general. Furthermore, these traditional approaches often fall short in the context of socio-economic analysis for Indigenous communities.

2. Research Questions Identified

- Perverse incentives that encourage the destruction of habitat to avoid future regulation or decreased value of development are widespread. **How can we use policy (e.g. regulatory assurances) to provide positive conservation incentives to counteract possible negative incentives for early development of 'potential' designated habitat areas on private lands? How can we design policies that reward firms for boosting increases in wildlife wealth?**
- **How should we measure the effectiveness of species at risk regulation?** i.e. the need to find a right way to measure success for conservation efforts. e.g. evaluation based on recovery would indicate current efforts have not been very effective, while evaluation based on preventing extinctions has been very effective. What are the potential reasons for 'success' if we look at preventing extinctions vs. recovery? How do we more explicitly identify and confront tradeoffs between these different possible objectives?
- **What conservation incentive programs have been found to be effective in the Canadian context? Why did these work/not work? What can we learn from other country's successes and failures?**
- **How should we effectively manage candidate species?** (i.e. those which are considered sufficiently threatened to warrant protection, but whose listing is precluded by higher priority activities.) Little attention has been paid to candidate species and how incentives work when species are imperiled but not listed. We need research that will help us understand both pre- and post-listing decisions.
- The inclusion of marine species is a gap in the current context of conservation efforts. It does not receive much attention because the concept of critical habitat is so different for aquatic vs. terrestrial species. Additionally, marine systems change more rapidly than terrestrial ecosystems (e.g. redistribution due to climate change, aqua-culture, offshore drilling), they are faced with large sources of uncertainty as well as ambiguity in governance, and are complicated by the significance of commercial and traditional fisheries to Canada's economy. **Given all these complications, how should we be effectively managing marine conservation and marine species at risk?**
- **What should happen after delisting?** While delisting decisions are less common than listing decisions, what tools exist and are effective to ensure population maintenance after delisting?
- **What are the effects of the increasing involvement of non-profit and private sector actors on decisions regarding the listing of species, funding and ultimate species recovery?** The role that environmental organizations play in species recovery through their expenditures, conservation efforts, and litigation is poorly understood. Nonprofit environmental organizations can play a significant role in species recovery through advocacy, education, and habitat restoration or protection, and through litigation to force regulatory action from government agencies or to block actions perceived to be detrimental.

- **How can we support increased multi-disciplinary collaboration in assessing and valuing natural capital and ecosystem management efforts, to jointly understand human behaviours, net benefits, as well as ecological dynamics?**
- **How can we encourage more widespread adoption of multi-species management approaches?**
- **How can we drive more quantitative studies exploring human-ecological systems, as supported by real data rather than hypothetical situations?**
- When thinking about natural capital accounting through the performance of capital stocks, **the economic program and feedback rules are not well understood. Furthermore, valuing “dividends” remains a challenge.**
- **Developing a better understanding between accounting for performance and benefit-cost analysis.**
- **Can we use natural capital asset values to provide insights in support of conservation prioritization efforts?** E.g. Protecting woodland caribou on oil sands areas is so expensive that the funds used for these particular herds could be used to save many herds elsewhere. What can the study of asset values tell us about prioritization and offsets?
- **What is the connection between natural capital research and life cycle analysis of biomass production?** There is a need to establish standards for evaluating biomass risk, highlighting the connection with biomass lifecycle analysis. This will involve addressing challenges relating to the existing legal frameworks (e.g. Who can contract or trade caribou?) as well as exploring regulatory risks associated with lifecycle analyses.
- **What are the impacts of conservation and species at risk efforts on development?** This question is currently complicated by the lack of rigorous and empirical evidence available from federal agency consultations, with most evidence of an informal nature.
- **The need for improvements in the socio-economic analyses that underlie conservation decisions** e.g. identifying impacts to different stakeholders; gender-based analysis; impacts on Indigenous Canadians. **Knowing that traditional cost-benefit approaches often fall short in the context of socio-economic analysis for Indigenous communities, how can we more effectively conduct these necessary analyses in these contexts?** E.g. estimating impacts on culturally significant species that are not necessarily well quantified by traditional estimation methods.
- **How to model evolving actual or perceived species valuation in relation to the discount rate used in subsequent analyses?** The changing public point of view of natural capital pricing means that the prices of different capitals in the future are not the same as they are today. How can this be accurately/appropriately estimated today, given that it is challenging to know what people will care about in the future (e.g. due to urbanization, changing preferences, cultural development etc.)?
- There is a need for **more studies (particularly in the Canadian context) that measure both the use and non-use values of iconic (or other) species at risk, to facilitate conservation decisions.**