

Compounding wildlife impacts of trafficking and the tourism sector A lens to examine ecological, social, economic, and political indicators of conservation impact

Abstract

I am investigating contexts of wildlife-based ecotourism that are most likely to maximize positive conservation impact. Much literature exists on the impacts of wildlife tourism across many regions and taxa. However, few studies have used cross-cutting meta-analysis techniques to determine indicators for the sustainability of these projects. I am testing whether certain social, ecological, economic, or political indicators are more highly correlated with the conservation impact of wildlife-based ecotourism projects. Using the frameworks outlined in Ostrom (2009), Krüger (2005), Waylen et al. (2010) and Salafsky & Wollenberg (2000), I will provide new data that can be used to develop context-specific guidelines and possibly to formulate a more general framework for ecotourism as a sustainable conservation strategy. There are multiple types of wildlife impact resulting from the tourism sector, which exacerbate negative conservation impact caused by wildlife trafficking. In this poster, I investigate intersections between conservation impact of tourism and trafficking.

Introduction

The tourism sector is growing fast, includes over 1 billion travelers, and is worth > \$7 trillion USD. Ecotourism occurs all over the world, but particularly in places with intrinsic beauty and high biodiversity. Many development and environmental organizations support ecotourism as an inherently "non-consumptive" use of biodiversity; however, for decades, many studies have documented conflict between conservation objectives and ecotourism results. By completing a meta-analysis of recent wildlife tourism literature using social, ecological, economic, and political indicators from Ostrom (2009), Krüger (2005), Waylen et al. (2010) and Salafsky & Wollenberg (2000), I will provide insight into specific contexts that might correlate with both positive and negative conservation impacts and sustainability. Flagship species and habitats that often draw tourists to destinations are likely to experience either direct or indirect negative impacts.

- Ecotourism results in three major types of negative wildlife impact (Green and Higginbottom [2001]). These impacts are compounding factors in cases where legal commercial trade or trafficking exists.
 - disruption of activity
 - direct killing or injury
 - habitat alteration (including provision of food)



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Examples of wildlife trafficking, tourism, and compounding impacts on CITES-listed species





Sea Turtles

•Sea turtles (family Cheloniidae) are a charismatic and iconic group; they are flagship species in tropical coastal regions. Sea turtle range may dictate where tourists choose to visit. •All seven species of sea turtles are protected under CITES Appendix I; six species are also listed as either Endangered or Threatened under the Endangered Species Act (ESA). •Sea turtles are poached for shells, eggs, meat, oil, and skin. •Tourism has replaced the turtling industry in many communities, but this has increased demand for products like meat and shells. •Tourism also has impacts on sea turtle habitat due to the development of beaches, bycatch, pollution, and boat traffic. Disturbance of nesting sites is of particular concern. •Snorkeling and diving with sea turtles as well as sea turtle watching has been reported to correlate with both physiological and behavioral variances in multiple species at multiple sites. •While sea turtle-based tourism can contribute positively in regards to education and sections of the local economy, widespread tourism management and enforcement measures are needed to ensure the conservation of these species.





Sharks and Rays

 Sharks and rays (subclass Elasmobranchii) are flagship species in many marine regions. Eight species of sharks and all species of manta rays are protected under CITES Appendix II. At least one quarter of shark and ray species facing extinction. •Sharks are poached for their fins, which are used in shark fin soup, as well as their meat and skin. Ray gills are used in Chinese medicine. Both groups face threats caused by bycatch, human-wildlife conflict, and impacts from tourism. •Globally, shark tourism supports 10,000 jobs and generates over \$314 million USD annually. Manta ray tourism generates over \$73 million USD directly, and \$140 million USD indirectly. •Many shark and ray based activities use either olfactory stimuli or artificial provisioning. Some studies have documented related impacts on individual behavior, physiology, and community composition in multiple species. This research is contested. •These species are highly migratory; thus, consumptive use in one region will compound any tourism-related impacts. •Further research and management in accordance with the precautionary principle is needed to ensure conservation.

Species	Effectiveness of local institutions	Association with protected
Locality	Importance to livelihoods	Type of tourism activity
Adaptability	Control and ownership of resources	Contribution to wildlife c

3. Analysis of ecological, socio-economic, and political indicators outlined in Ostrom (2009), Krüger (2005), Waylen et al. (2010) and Salafsky & Wollenberg (2000) (examples above)

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Queen Conch

•Queen conch (Strombus gigas) is listed on CITES Appendix II; It is an economically and culturally important Caribbean fishery. This species is exported at extremely high trade volumes beyond available supply; the U.S. is the primary importer.

•Populations are declining throughout its range; compounding threats include overfishing, pollution, and habitat disturbance. •Landing and export data are inconsistent. Recorded weight may refer to frozen, fresh, or dried meat; fisheries are poorly monitored. •Despite petitions, the National Marine Fisheries Service did not list queen conch under the ESA in 2014.

•Queen conch is an iconic symbol of Caribbean tourism; tourism facilitates increased local consumption and poaching. Shells are mainly sold to tourists, who take them as personal effects often without documentation or permits. Thousands of shells are seized annually. Meat is often sold to restaurants with tourist clientele. Conch fishing is sometimes part of tours.

•In some countries, the primary market for queen conch is thought to be the tourism industry.

•There are insufficient educational programs for tourists. Widespread management, enforcement, and awareness campaigns are needed to prevent the extinction of this species.

Preliminary Results

- Ecotourism can support communities through income, capacity-building. and education, but cannot develop markets that reflect all of its values.
- Most analyses of ecotourism have focused on economic and social viability rather than environmental impact.
- Wildlife tourism and ecotourism studies may be conflicting due to narrow spatial, temporal, and disciplinary focus.
- Certain environmental and community characteristics (ex. shared decisionmaking, trust, and knowledge of sustainability concepts) may make mitigation strategies more feasible.
- Collaboration with the private sector through programs
 WILDLIFE minimize the negative impacts of the tourism industry on wildlife conservation through greater awareness and the availability of wildlife friendly options.



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4. Multivariate statistics

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