Minding the gaps: Geospatial Synthesis of Poaching Patterns Using a Web-based Tool

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Research Summary

Wildlife poaching is a complex issue that requires multiple methodologies to enable protected area practitioners to defeat poachers. One challenge that protected area practitioners face is understanding disparate geospatial data derived from protected areas (Moreto & Lemieux, 2015; Reuter & Bisschop, 2016; Zeller Zigaitis & Robinson, 2023). A review of literature and recent field site visits, revealed that geospatial data collected in protected areas for poaching mitigation efforts is derived from two main sources: device-based and human-generated. This research defines device-based geospatial data as digital data derived from geospatial technologies to include but not limited to: camera traps, unoccupied aerial systems (UAS), and radio collars. Human-generated geospatial data is defined as primarily analog data derived from human means through handwritten reports or manual input into a database.

This research contributes to the displine of geography, specifically the GIScience subdiscipline, by characterizing the synthesis of geospatial data within the context of poaching mitigation efforts. This ongoing research examines how practitioners perceive disparate geospatial data. Specifically, this research focuses on characterizing the process of synthesis of device-based and human-generated geospatial data within protected areas, by evaluating an online geovisualization tool to map poaching-related data within protected areas. This study seeks to answer the following research question: *How do novice and experts make sense of varied geospatial data in order to mitigate poaching within protected areas?*

To answer this question, I developed a participatory mapping exercise to understand how notice and experts make sense of disparate geospatial data using a poaching scenario. I created a notional protected area (called Tro-Fallon park in the country of Illiskasia) using approximately 235 acres of land in southern Illinois as the area for the park. As part of the development of the notional park, geospatial features were created (as shapefiles) to include park boundaries, administrative areas, and visitor viewing areas. Additionally, real geospatial sensors in the form of camera trap and drone imagery was collected over the parcel of land in southern Illinois which served as the notional park with the permission of the land owner. Finally, synthetic data in the form of ranger reports were created to give the scenario similar examples of geospatial data collected in real-world protected areas.

The design of this experiment relied on two online tools: the Qualtrics survey tool and a geovisualization tool called EarthRanger. The Qualtrics survey consisted of six sections, which included survey question prior-to and after the completion of tasks in the EarthRanger tool. EarthRanger was used in the study as the primary geovisualization tool to understand how people make sense of various types of poaching-related geospatial data typically collected by protected areas. I chose EarthRanger as the mode of research for two reasons. First, EarthRanger is currently used by protected areas in 47 countries, on six continents (*EarthRanger*, n.d.). Second, the company that owns the EarthRanger tool was very supportive

of efforts to understand how practitioners make sense of various poaching-related geospatial data, and allowed me access to create a study environment.

To date, participants for the study were selected from two general population pools: novices and experts. Novice participants were primarily undergraduate students from Penn State University (PSU) who had little to no experience working with geospatial data or online mapping tools. This population of participants was chosen as they were likely close in knowledge and experience to protected area personnel who were new to working poaching issues using geospatial data. A portion of the Illinois Geographical Society (IGS) grant has paid for the cost of travel and lodging while conducting the study in-person at Penn State. The second population of participants (to date), were individuals who had experience working with geospatial data though professional experience. These individuals were primarily geospatial analysts who worked for the United States government. Participants conducted the research locally at the Technology Entrepreneur Center (also called the T-REX) in downtown St. Louis, MO or via Zoom. Finally, I hope to obtain additional expert participants in-person via field site visit to South Africa or Kenya dung the summer of 2023. The remaining IGS grant will be used towards this travel.