

USING GEOTAGGED PHOTOS TO DESIGN ETOSHA NATIONAL PARK MAP SET

DIPLOMA THESIS

OBJECTIVES

National parks are frequently the top destinations for nature-based tourism because they showcase the most representative ecosystems within a country and provide a variety of benefits to individuals and communities, including physical and mental well-being, raising awareness about natural areas, and connecting with nature. The user-generated content from social media provides new alternatives for assessing tourism and recreation in national parks by analyzing visitor inflow and their sentiments, assigning economic values.

The thesis aimed to design cartographic-style maps for younger people, the public, and experts that visualized wildlife species distribution information using geotagged photos and landscape features of the Etosha National Park. The designed maps are then published on the web, combined with an interactive map that allows users to dynamically interact with wildlife data and landscape features of the park in a user-friendly way. The overall aim is divided into three major objectives.

- I. Develop a workflow for collecting wildlife geotagged photos from multiple public sources.
- II. Design maps of Etosha National Park for multiple user groups
- III. User evaluation and publish map sets on a web platform

METHODOLOGY



The study area selected for this research is Etosha National Park, which is in the northwest part of Namibia. This park covers an area of 22,937 km², is the most popular tourist destination in Namibia, and is considered one of the largest wildlife sanctuaries in the world.

The Etosha Pan is the most distinctive and remarkable geomorphological landform feature of the park, which comprises around 23% of the Etosha National Park. The Pan area turns into a lake in the rainy season and becomes dry when there is less rainfall.

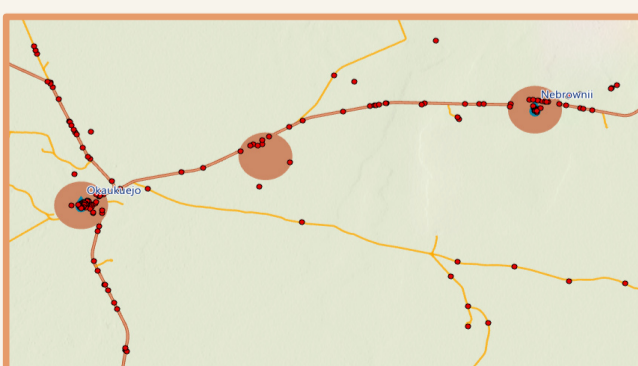


Overall workflow of this research

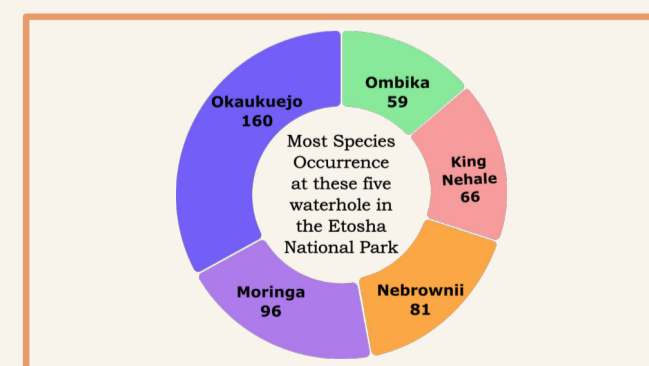
I. The analysis is divided into three parts. In the first part, geotagged images of wildlife were acquired from Flickr through their API and Google Earth Pro.

II. In the second part, a brief analysis was done on the acquired geotagged photos to identify wildlife species that exist at different waterholes. The output of the analysis was used to design cartographic maps for different groups using different color schemes, infographics, intuitive icons for wildlife species, and landscapes.

III. In the third part, user evaluations of the designed map were performed and published on the web, combined with an interactive map.



Buffer analysis for wildlife distribution



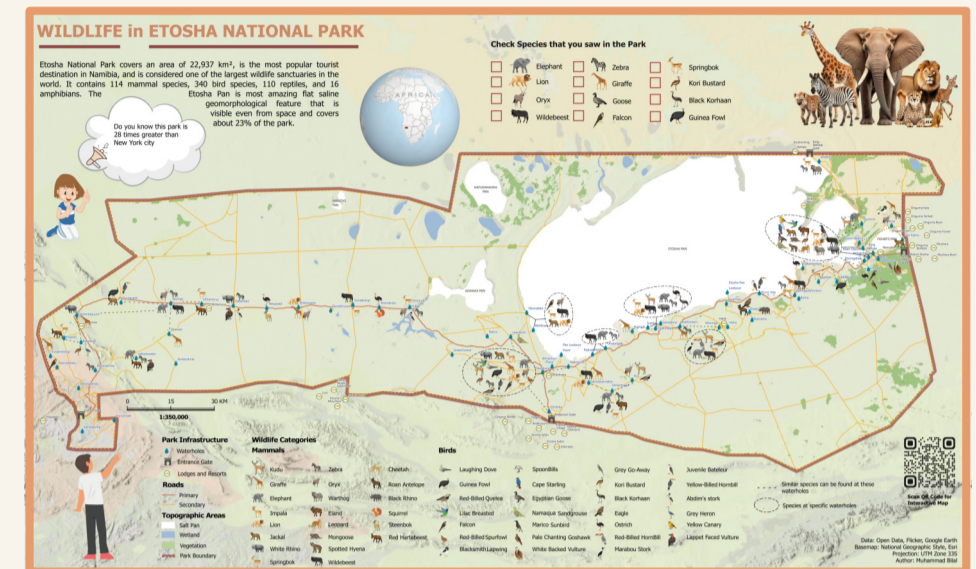
Waterholes that has most wildlife occurrence

RESULTS

The final output of this diploma thesis was three designed cartographic maps that visualize wildlife species distribution information and landscape features of Etosha National Park. The second output was an interactive map that allows users to dynamically interact with different features of the park in a user-friendly way and includes functionality like zooming, popups, and clusters of wildlife species.

Younger group map features:

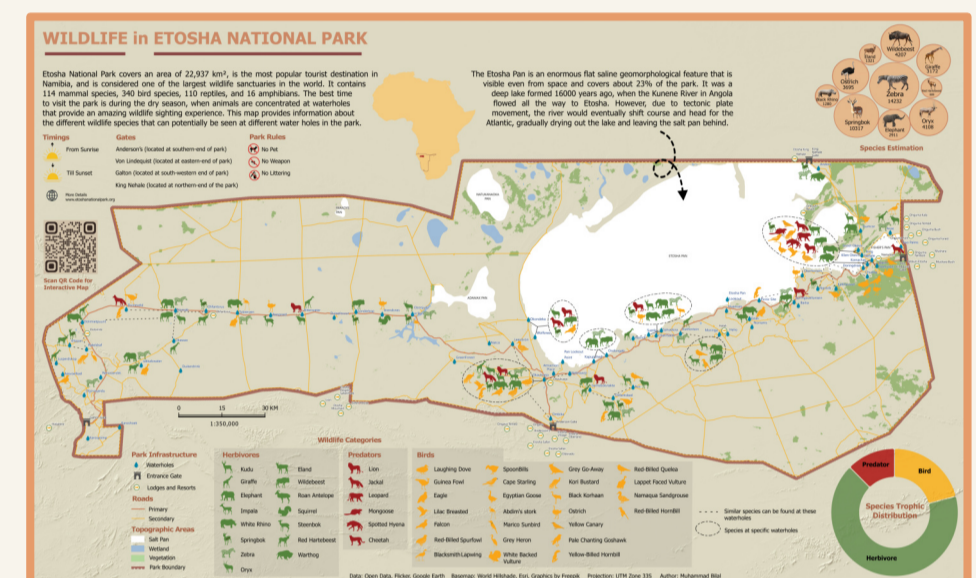
- Graphics for species
- Kahoot game
- QR code for web map
- Park characteristics



Younger Group Map

Public group map features:

- Graphics for species
- Trophic level chart
- QR code for web map
- Park characteristics
- Species estimation graphics



Public Group Map

Expert group map features:

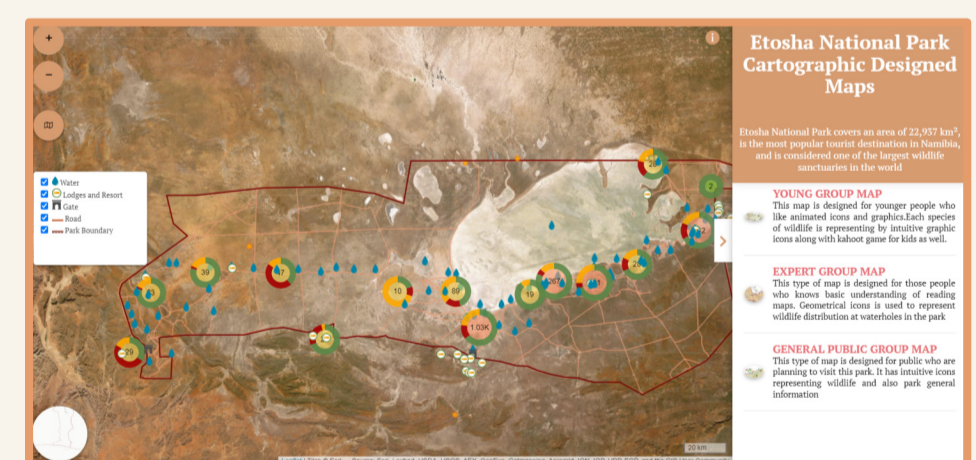
- Geometrical icon for species
- Trophic level chart
- QR code for web map
- Park characteristics
- Species estimation graphics
- Distribution Count using Wurman Dot method



Expert Group Map

Web map features:

- Dynamic interaction with species data
- Zooming functionalities
- Popup with images of species
- Designed maps view or download
- Multiple basemaps



Web Map Interface



QR Code allow user to access:

- Web map
- Designed maps.

CONCLUSION

In conclusion, the designed maps have proven to be a valuable resource that can act as a guide for tourists who are planning to visit Etosha National Park and gain information about the occurrence of wildlife species in the park. Further, the designed cartographical maps can also help park authorities assign more financial resources where wildlife is mostly seen and declare game viewing spots without disturbing the wildlife.

This research concept can be easily repeated for other national parks in Namibia or in other parts of the world that could attract more tourists to the national parks by providing information related to wildlife species.

ACKNOWLEDGMENTS

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 Co-Supervisor: Dr. Hermann Klug (Paris Lodron University Salzburg)
 Olomouc, 2024
 Attachment to diploma thesis no. 7

