Spatial Analysis of Anthropogenic Impacts on Gorilla Migratory Pathways in Okwangwo, CRNP, Nigeria

By

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PRESENTATION OUTLINE

• Introduction
• Statement of problem
• Aim and Objectives
• Why GIS
• Method
• Results
• Conclusion
• Discussion /Questions
Introduction

• Okwangwo Division is part of the Cross River National Parks (CRNP)

• There are 6 other National parks in Nigeria

• Home to endemic and critically endangered primates
  ‘Gorilla gorilla diehli’ (IUCN 2005)

• Host 2 enclave communities
Statement of problem

- Enclave communities pose some challenges for conservation,

- Reported gorilla–human conflicts

- Humans poach gorilla and gorilla steal/destroy farms.

- Lack of clear demarcated boundaries resulting in unaccountable encroachment into the park and gorillas migratory pathways.

- Unchecked anthropogenic activities in the area could increase the insecurity of both humans and gorillas, thereby thwarting conservation efforts.
Aim and Objective

• The **aim** of the study is to analyze the impact of human activities on the gorilla migratory pathways in the CRNP.

• **Objectives**

  • Examine existing jurisdictive boundary of the park vis-à-vis the enclave communities with a view to establish an accurate border line.
  • Model gorilla migratory pathway
  • Determine and spatially analyze the impacts of anthropogenic activities on migratory route.
Why GIS

• GIS maps representations enable greater understanding of phenomena and help to upscale spatial intelligence for conservation planning.

• Modeling of attributes/phenomena using GIS provides synoptic visualization and accurate representation.

• Data components are conveniently managed, updated and stored in a trendy GIS environments.

• GIS provides thematic combination of layers that help to reveal relationships between phenomena in ways that cannot be obtained through any other means.
Data Requirement:

• Landsat 7 ETM path 187 row 056
• SRTM data
• Field Data (GPS Coordinates, etc)
• Gazette Document establishing the National Park (i.e Decree № 36 of 1991)
• Relevant existing base map.
Method

• Objective 1:
Examine existing jurisdicitive boundary of the park vis-à-vis the enclave communities with a view to establish an accurate border line

• Translate vivid description of park boundary * into map and compare with existing maps in order to **delineate accurate park boundaries**

Action plan:
1. Map Validation
2. Translate map to ground - Demarcation type is critical
Method Cont.

- **Objective 2: Model gorilla migratory pathway**

- Gathered information on migration behavior and ecology from literature.

- Identified the most important factors for migration and additional variables that modify factor importance in certain locations.

- Developed conceptual models based on these factors and modifiers.

- Translated each important factor for migration into a GIS layer.

- Combined GIS layers to represent each group’s conceptual model and create a migration map.

- Validate statistical associations between map predictions and documented observations - Boyce Index
Result 2

Action plan:
1. Invoke the Agreement on the Conservation of Gorillas and Their Habitats (also called ‘the Gorilla Agreement’)
Method Cont.

- Objective 3: Determine and spatially analyze the impacts of anthropogenic activities on migratory route.

- Field observation, Data collation and simple tabulations / ranking
- Landsat (LULC classification)
### Result 3

**Anthropogenic Activities affecting gorilla migratory route**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Rating</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming</td>
<td>high</td>
<td>Located on migratory route Static Visible activity</td>
</tr>
<tr>
<td>Hunting</td>
<td>moderate</td>
<td>Dynamic activity</td>
</tr>
<tr>
<td>Logging</td>
<td>low</td>
<td>State moratorium on logging</td>
</tr>
</tbody>
</table>
The table below shows the data for the farming encroachment between the enclaves:

<table>
<thead>
<tr>
<th>ID</th>
<th>Farm</th>
<th>x</th>
<th>y</th>
<th>Age</th>
<th>size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cocoa Farm</td>
<td>525329.06</td>
<td>697598.7</td>
<td>7 year old</td>
<td>500 sq m</td>
</tr>
<tr>
<td>2</td>
<td>Cocoa Farm</td>
<td>525494.95</td>
<td>697660.2</td>
<td>8 year old</td>
<td>500 sq m</td>
</tr>
<tr>
<td>3</td>
<td>Cocoa Farm</td>
<td>525623.94</td>
<td>697767.8</td>
<td>9 year old</td>
<td>500 sq m</td>
</tr>
<tr>
<td>4</td>
<td>Old Farmland</td>
<td>526585.72</td>
<td>697544</td>
<td>5 year old</td>
<td>300 sq m</td>
</tr>
<tr>
<td>5</td>
<td>Farmland</td>
<td>526776.22</td>
<td>697516.5</td>
<td>&gt; 5 years old</td>
<td>200 sq m</td>
</tr>
<tr>
<td>6</td>
<td>Farmland</td>
<td>526813.09</td>
<td>697513.4</td>
<td>&gt; 5 years old</td>
<td>200 sq m</td>
</tr>
<tr>
<td>7</td>
<td>Farmland</td>
<td>527074.22</td>
<td>697581.1</td>
<td>&gt; 5 years old</td>
<td>250 sq m</td>
</tr>
<tr>
<td>8</td>
<td>Farmland</td>
<td>527276.99</td>
<td>697605.8</td>
<td>&gt; 5 years old</td>
<td>150 sq m</td>
</tr>
<tr>
<td>9</td>
<td>Farmland</td>
<td>527421.45</td>
<td>697486.1</td>
<td>&gt; 5 years old</td>
<td>200 sq m</td>
</tr>
<tr>
<td>10</td>
<td>Farmland</td>
<td>527525.92</td>
<td>697464.7</td>
<td>&gt; 5 years old</td>
<td>4 hectares</td>
</tr>
<tr>
<td>11</td>
<td>Farmland</td>
<td>527642.64</td>
<td>697532.3</td>
<td>&gt; 5 years old</td>
<td>100 sq m</td>
</tr>
<tr>
<td>12</td>
<td>Mixed tree crop</td>
<td>527753.21</td>
<td>697615.2</td>
<td>&gt; 5 years old</td>
<td>300 sq m</td>
</tr>
<tr>
<td>13</td>
<td>Mixed tree crop</td>
<td>527845.35</td>
<td>697689</td>
<td>&gt; 5 years old</td>
<td>4 hectares</td>
</tr>
</tbody>
</table>
farming encroachment between the enclaves
Farming

Action plan:
Enforce confinement to enclave jurisdiction and think relocation (IFF)
Need for trans border ‘collaboration
Conclusion

- The study found that improper delineation of park boundaries is resulting to encroachment into gorilla migratory corridors.
- Farming and poaching are major anthropogenic activities affecting gorilla migratory routes in the study area.
  - The impacts include but not limited to:
    - Heightened human-gorilla conflict
    - Destruction of farms
    - Hostilities and disharmony
    - Conservation impediments
Recommendations

Effective conservation of wildlife in the study area require

• Proper ground demarcation of the park boundaries
• Protection of migratory pathways,
• Community sensitization,
• Regional awareness, and reinforcement of trans-border collaboration with neighboring Cameroon
Thank you for your attention, Its nice to be here