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Harnessing GIS and Remote Sensing Technologies for Innovative Wildlife Monitoring in the Avu Lagoon Community Protected Area (ALCPA), Ghana

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Contents

- Overview of ALCPA
- Rationale for Using GIS & RS
- Technologies and Tools Used
- Challenges
- Future direction



Overview of ALCPA

- Located in Volta Region of Ghana
- It is the home Sitatunga (Marshback) is an endangered species found only in the Avu Lagoon in Ghana (NCRC, 2008).
- Avu lagoon remains one of the three suitable habitats for Sitatunga in West Africa (Brichieri-Colombi et al., 2016; McPherson et al., 2016).
- As a seasonally flooded landscape, the ecological integrity of the area is threatened by conflicting land uses



Rationale for Using GIS & RS



Population Monitoring



Habitat Monitoring



Behavioral studies



Threat identification



Technologies and Tools Used

AfricaGIS 2025 and UN-GGIM: Africa XI Joint Conference



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Direct Observation

5:45 LTE 97

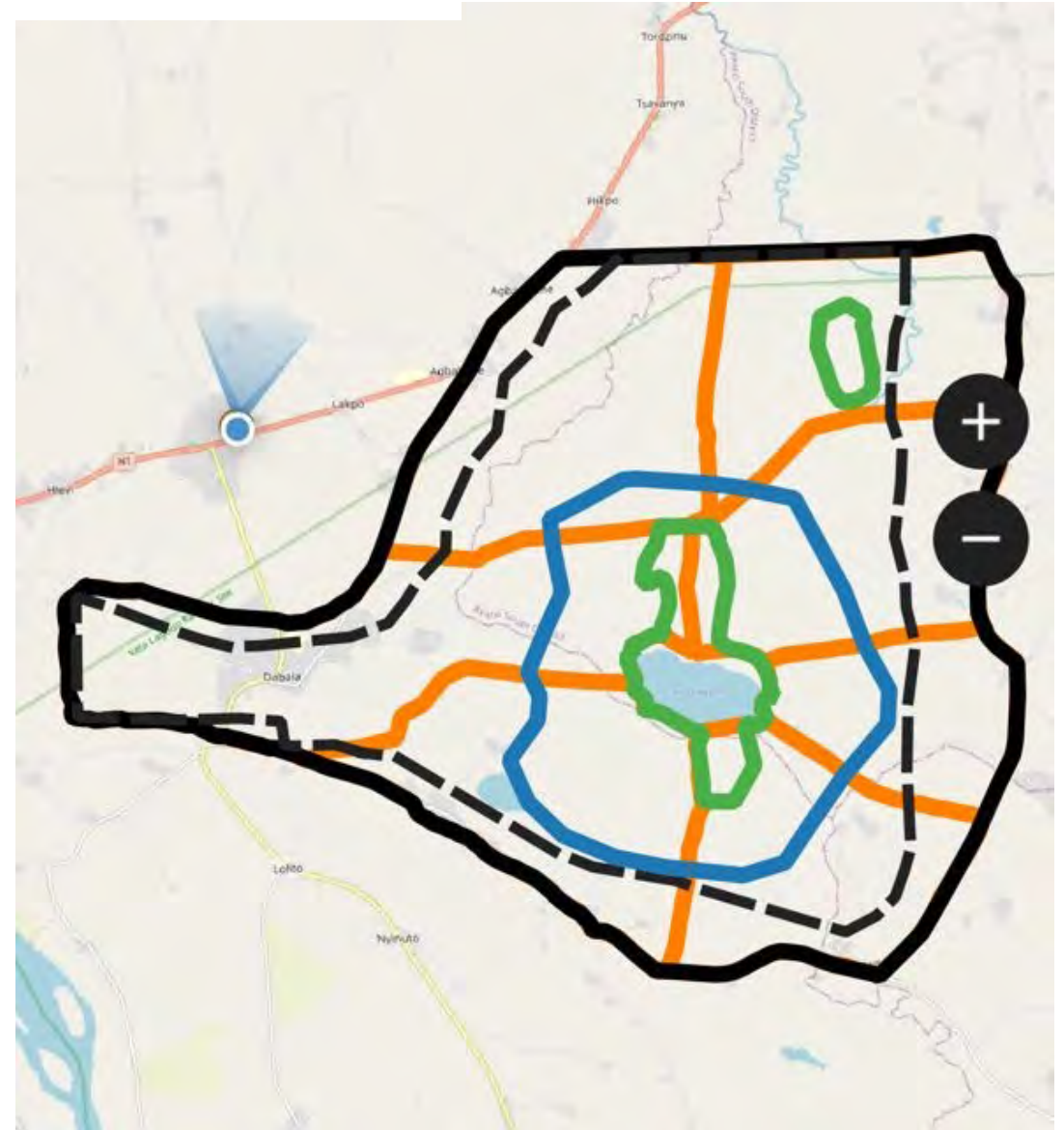
✕ Avu Lagoon Patrol Datasheet 📶 ☰

Date


📅 Friday, July 19, 2024 ✕

Area Name

- ☐ Bolome
- ☐ Kleve
- ☐ Agbeve
- ☐ Yorta
- ☐ Wenu
- ☐ Kogokope
- ☐ Aqbaqorme



Data Management and Staff Training Session

 ArcGIS Survey123 ▾


My surveys

Organization

My Surveys

+ New survey







All surveys ▾




Records: 161

Avu Lagoon Patrol Data Sheet

by avulagoon









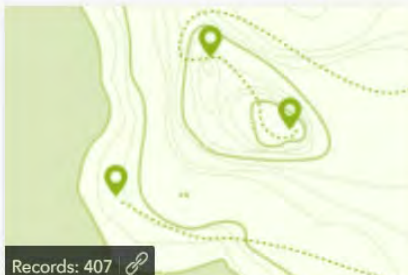


Records: 24

Drone Survey Data Sheet

by avulagoon












Records: 407

Camera Trap Data Sheet

by avulagoon











Records: 186

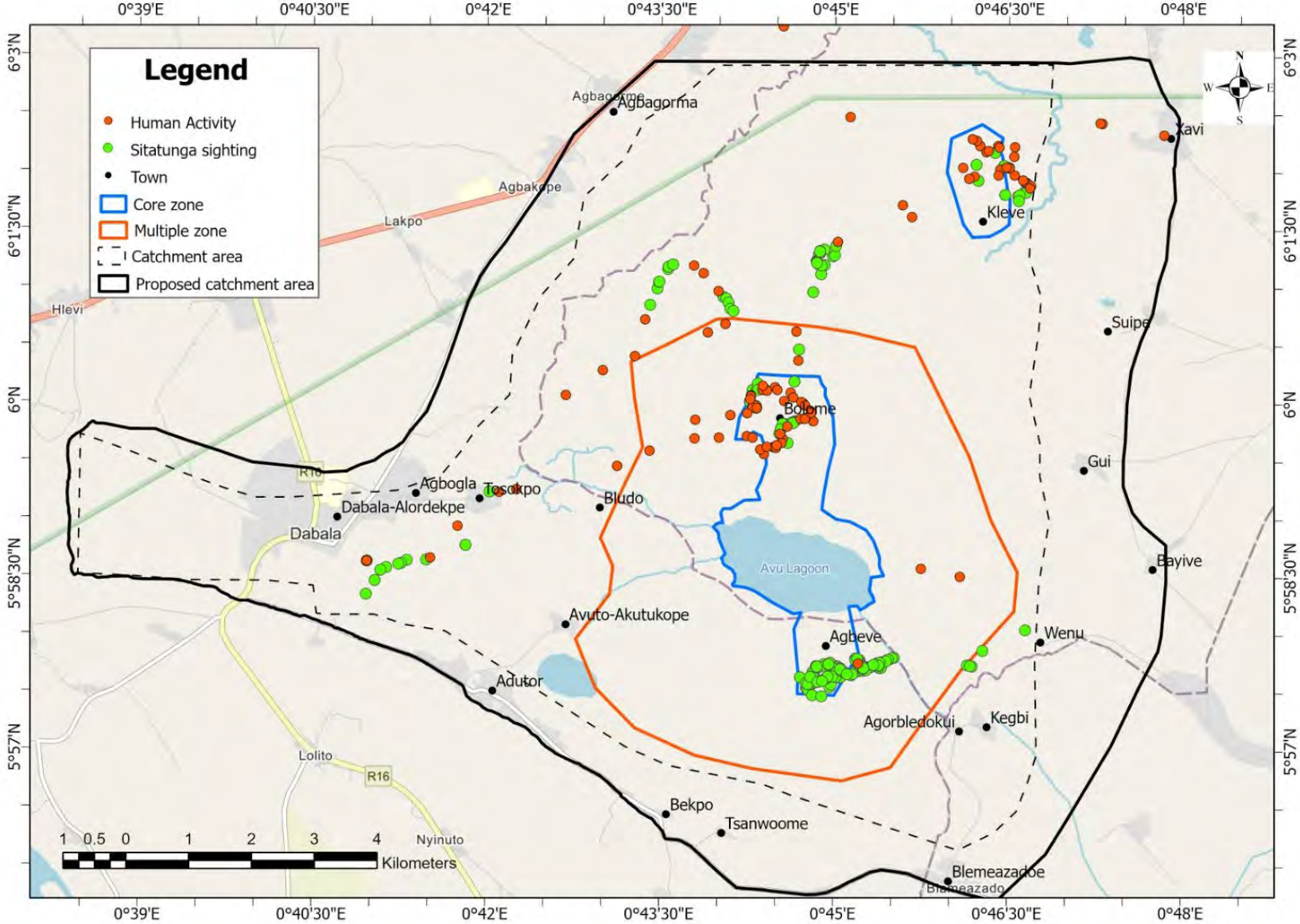
Visitor Information

by avulagoon





Human-sitatunga interface (2023-2024)





Camera Trapping



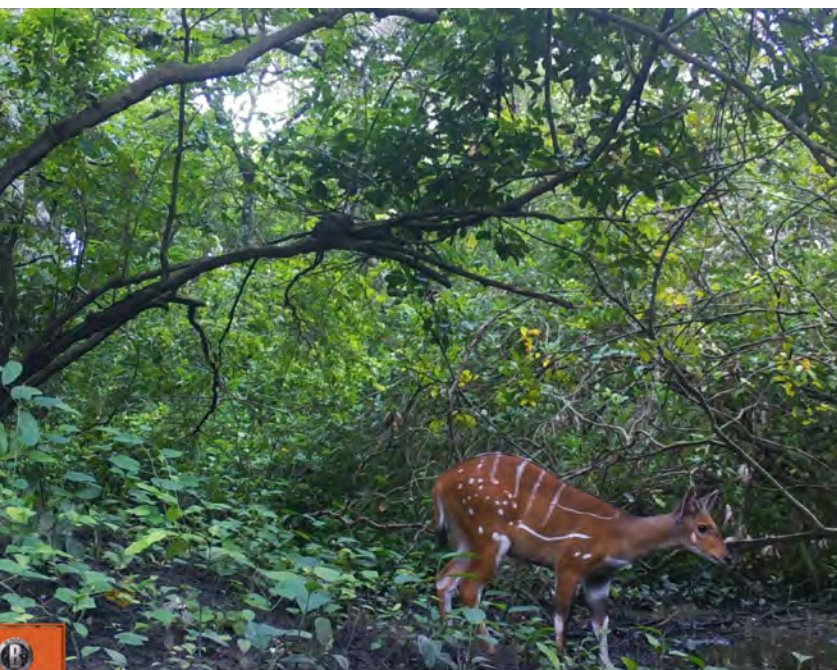
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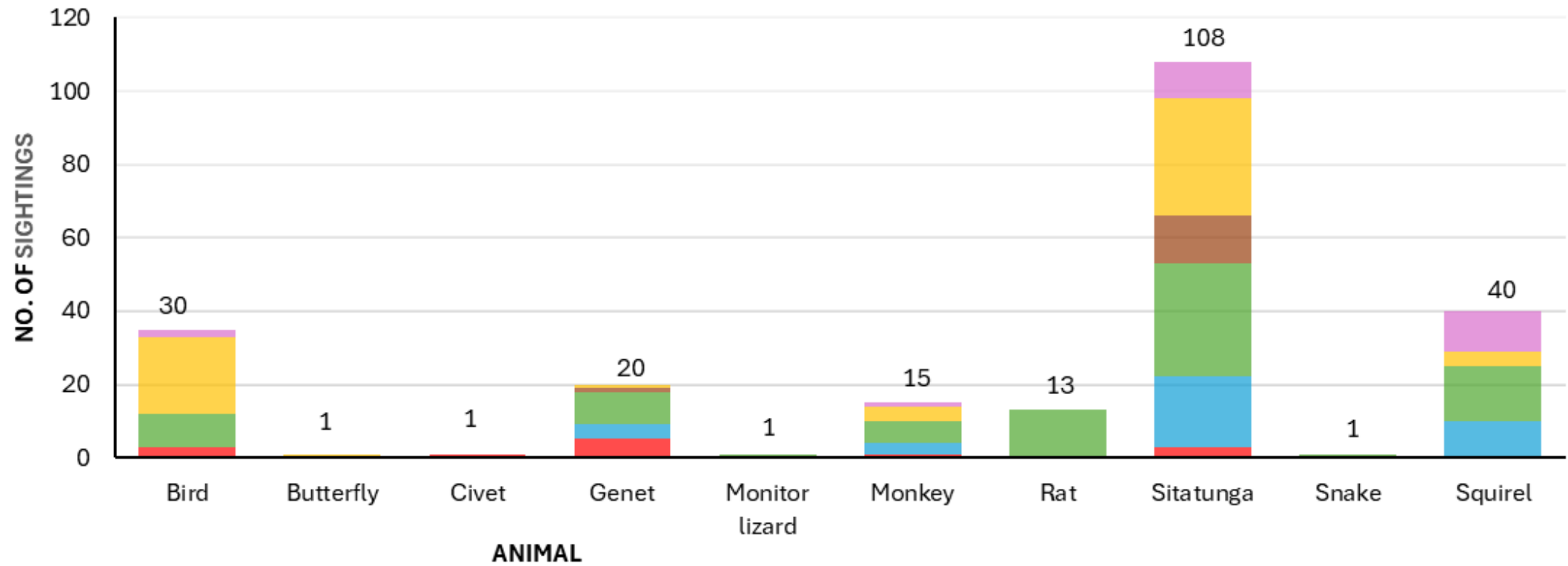


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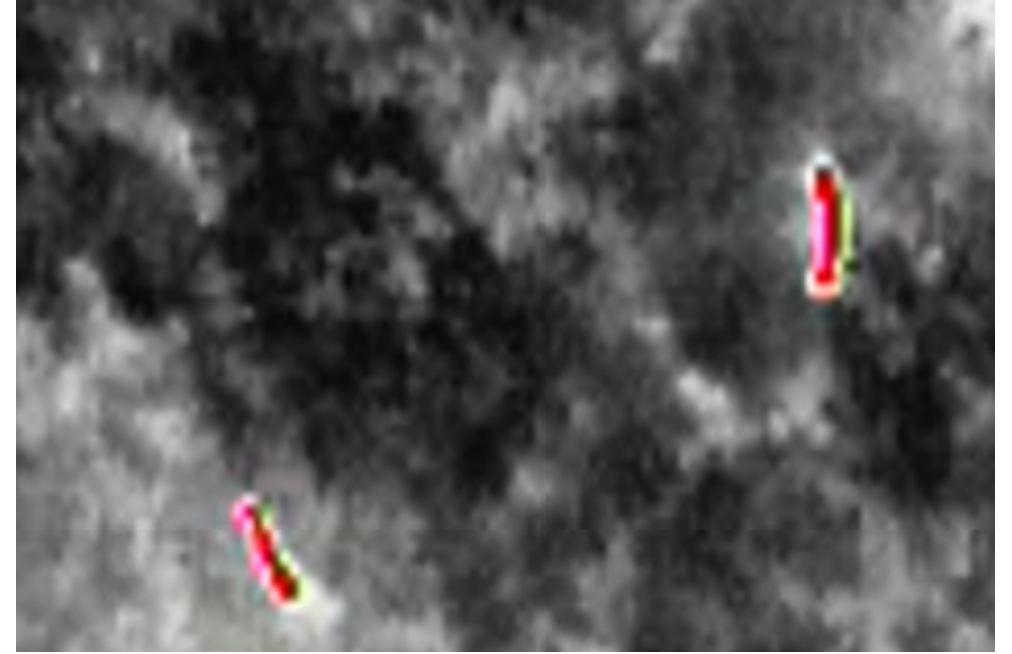
Bushnell M TROPHY CAM 78°F 25°C 07-22-2020 16:30

CAMERA TRAP SIGHTINGS FROM 2018-2023



Legend (Total/Year)

2018 (13) 2019 (36) 2020 (85) 2021 (14) 2022 (63) 2023 (24)



Drones for Wildlife Monitoring



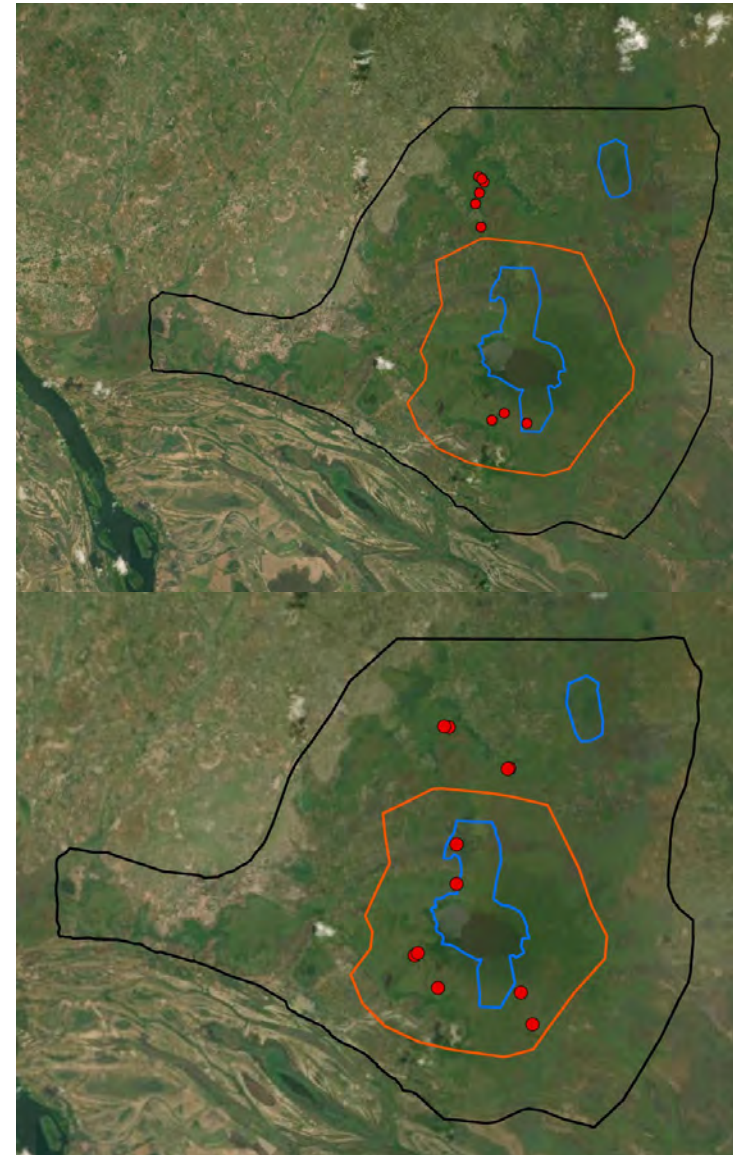


Dry season-March

| AREA | LAT | LONG | NUMBER OF SITATUNGA | MALE | FEMALE | YOUNG |
|----------|----------|----------|---------------------|------|--------|-------|
| AGBAGOME | 6.027432 | 0.736897 | 1 | 1 | | |
| | 6.027623 | 0.73589 | 1 | | 1 | |
| AGBEVE | 5.962584 | 0.734475 | 1 | 1 | | |
| | 5.970832 | 0.728726 | 2 | 1 | 1 | |
| | 5.962632 | 0.734506 | 2 | | 1 | 1 |
| | 5.971346 | 0.729571 | 1 | 1 | | |
| BOLOME | 5.998354 | 0.738936 | 1 | 1 | | |
| | 5.988458 | 0.739001 | 2 | | 1 | 1 |
| KLEVE | 6.017284 | 0.751956 | 1 | 1 | | |
| | 6.016952 | 0.751632 | 1 | | | 1 |
| WENU | 5.961682 | 0.755203 | 1 | 1 | | |
| | 5.953675 | 0.758037 | 1 | | 1 | |
| | | | 15 | | | |

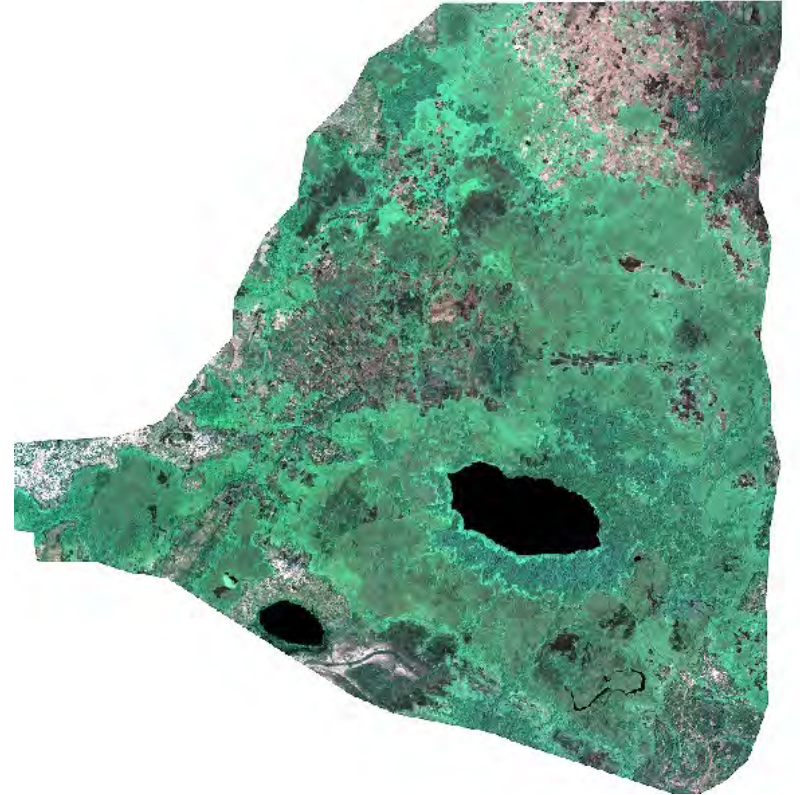
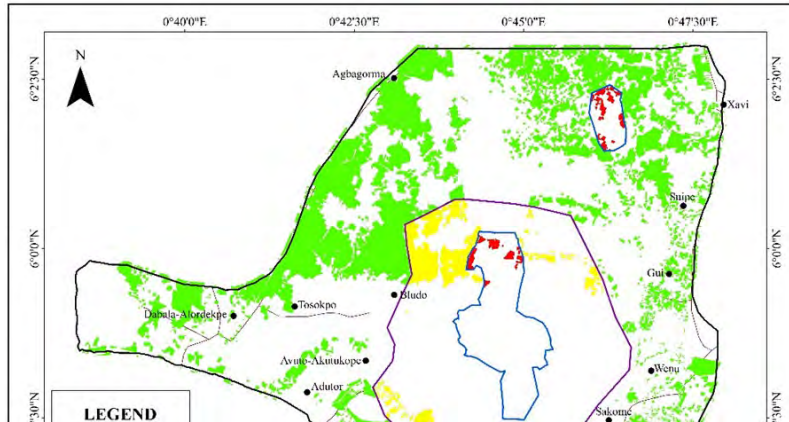
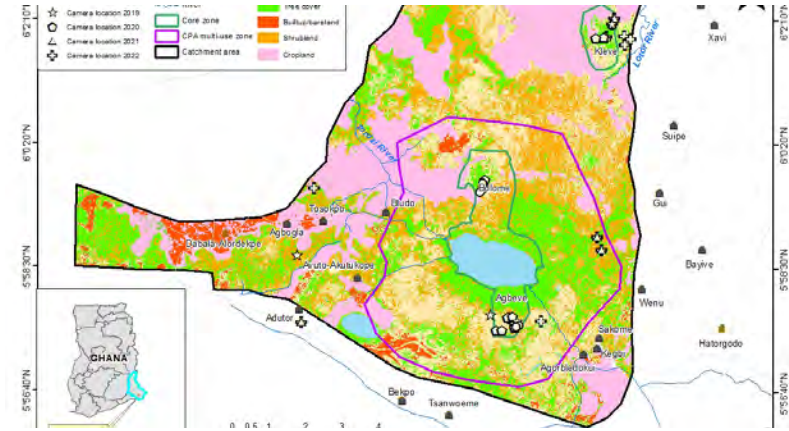
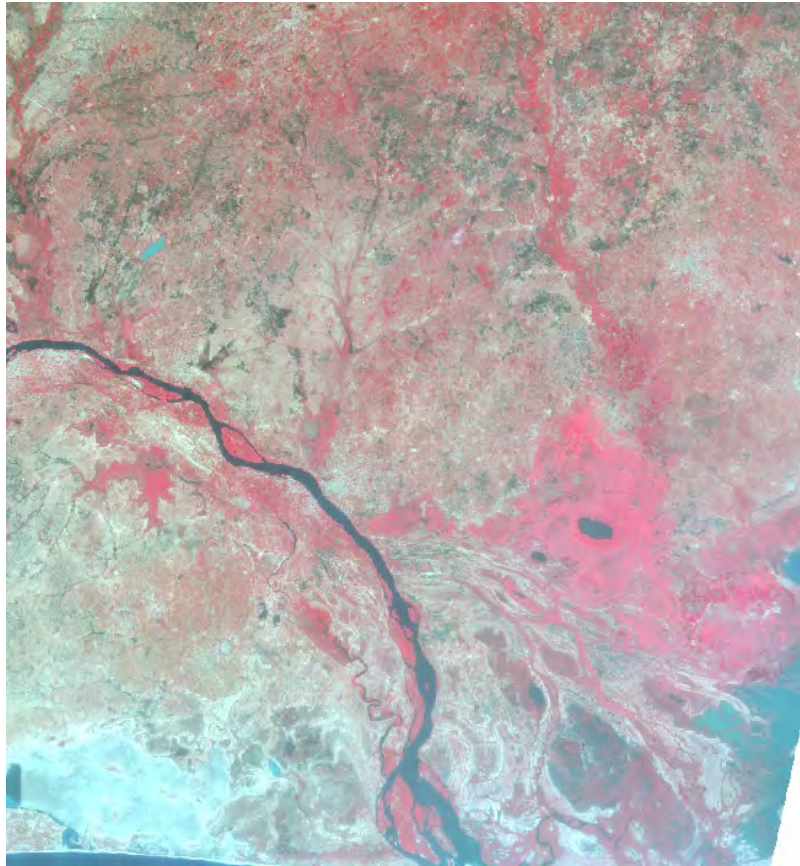
Wet season-July

| AREA | LAT | LONG | NUMBER OF SITATUNGA | MALE | FEMALE | YOUNG |
|----------|----------|----------|---------------------|------|--------|-------|
| AGBAGOME | 6.029647 | 0.732528 | 2 | 1 | 1 | |
| | 6.025 | 0.732778 | 2 | | 1 | 1 |
| | 6.021944 | 0.731667 | 1 | 1 | | |
| | 6.028056 | 0.73416 | 1 | | 1 | |
| | 6.015475 | 0.733222 | 1 | 1 | | |
| | 6.028864 | 0.733374 | 1 | | 1 | |
| AGBEVE | 5.961111 | 0.736587 | 1 | 1 | | |
| | 5.960278 | 0.746411 | 2 | 1 | 1 | |
| | 5.963128 | 0.740088 | 1 | | | 1 |
| | | TOTAL | 12 | 5 | 5 | 2 |





Drones for Habitat Monitoring



Satellite Imagery

Challenges

- Cost
- Interference
 - Strong winds
 - Human
- Wildfires



Future Directions

- Integration of AI
- Drone swarm technology
- Use of Automated and real-time monitoring Systems
- Acoustic Monitoring
- Citizen Science Integration





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Thanks

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