

A MOBILE APP AND AN EMPOWERED CITIZEN NETWORK TO STRENGTHEN MARINE WILDLIFE RESEARCH AND CONSERVATION

Good practice

Description

/ Introduction

In 2014, the African Marine Mammal Conservation Organization (AMMCO) was created to address the threats faced by marine megafauna species, especially marine mammals in Cameroon. The organization recognised that marine mammals primarily face poaching, accidental capture, and habitat degradation due to pollution and human activities. These threats are intensified by the lack of essential scientific knowledge to guide conservation actions and management decisions. Based on this understanding, AMMCO's mission is to contribute to the protection of aquatic megafauna and their habitats in Central Africa by developing synergies to improve scientific knowledge, the livelihoods of fishing communities and law enforcement.

**Marine
mammals**
management toolkit



In Cameroon, nearly 4,000 fishermen rely on fisheries' resources for their food and livelihoods. Fishing activity is primarily focused within nearshore waters close to the estuaries of the rivers, reef structures and coastal ecosystems. These fishing grounds often overlap with essential habitat or migratory corridors of marine mammals, placing fisherfolk at the forefront of marine mammal sightings.

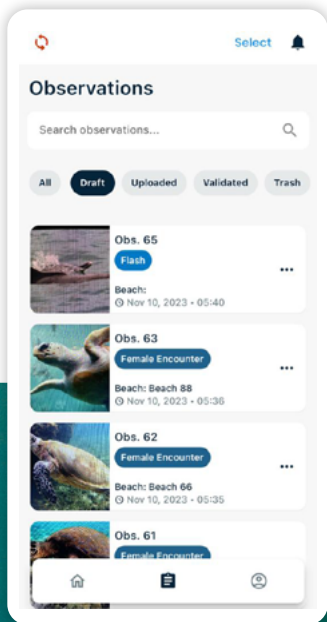
Due to the diurnal behaviour and general avoidance of humans, marine mammals in west Africa, such as the West African manatee, are a challenge to monitor making scientific field surveys for research and inventories less productive and costly. Furthermore, research requires advanced equipment and skills that are not always available within the region. AMMCO therefore recognised that fisherfolk form a valuable collaborator to monitor and report marine mammal sightings. As such, AMMCO established a network of fisherfolk to report sightings.

The first model of this network was based on paper sheets that fisherfolk used to record and report information. However, there are many challenges associated with paper in marine environments, including transcribing errors and data interoperability as well as difficulties in recording GPS location associated with sightings.

Based on these challenges, the SIREN mobile app was developed to support collaborative efforts in collecting information on marine wildlife, their habitat, and

associated facts such as threats. The app facilitates data gathering, allowing the user to collect a photograph of the sighting along with a description of the environment and species in just a few clicks, with the option to upload up to four photos. The SIREN app also records the location and the date of the record automatically, overcoming many of the challenges experienced in the first model. SIREN is a user-friendly app designed to work on Android and iOS operating systems, with a web interface where observation data are uploaded for visualisation and project management. This citizen science approach also presents a cost-effective

means for researchers, managers, and practitioners to collect scientific data on marine mammals with the region.



/ Involved stakeholders

BENEFICIARIES:

Once collected and uploaded to the SIREN website by field observers, scientists, non-governmental organisations (NGO), government agencies, managers, and stakeholders (including fisherfolk) are able to visualise and analyse the aggregated data to inform marine mammal management practices. With fish stocks decreasing at an alarming rate, fishing communities are increasingly more aware and driven to improve their activities by combining sustainable fishing practices with marine conservation.

USERS:

During their usual activities, fisherfolk, conservationists, tourists, students, scientists are able to utilise the application to collect valuable data on marine wildlife sightings and upload them to the server. Collecting this information does not require immediate wireless data access; information collected can be saved locally on the phone until internet access is available to upload to the server. The data collected are used by fisherfolk to identify hotspots for fishing and sites to avoid or reduce direct conflict with wildlife, whilst conservationists and decision-makers use the data as baseline knowledge to guide conservation or management activities.

IMPLEMENTING AGENCY:

The AMMCO SIREN development team comprised of a global team of user experience (UX) designers, software engineers and other technology experts.

OTHERS:

Each project is directly managed to provide data quality checks and review of submitted information. These data are reviewed by the project manager prior to being published. Once published, a sighting network is developed which is subsequently managed by the project manager. This involves, and benefits, civil society organisations, universities, and government agencies.

/ Impact

To date, SIREN has helped document more than 20,000 observations in 4 different countries since 2014, encompassing over 300 aquatic species, including 13 marine mammals. The data collected have assisted the Cameroon government in updating the National Law of Forestry and Wildlife, adding four marine mammal species to the list of fully protected species in Cameroon. Previously, only the West African manatee was protected, demonstrating significant impact of the app's ability to improve management and governance by influencing national policies. Fisherfolk engaged in the network have been further sensitised to marine mammals, fostering a deeper affinity to their protection, and the impact of their contributions has been realised with some fisherfolk becoming ambassadors of marine wildlife in the region. The database of marine animal observations has been, and continues to be, instrumental in creating a catalogue of marine biodiversity for the poorly studied coast of Cameroon.

/ Innovation

The SIREN project is structured as an international open collaboration effort, where various stakeholders, especially scientists, engaged with the development team early in the design process. This ensures the development of an application that met the perceived needs of fisherfolk, scientists, and decision-makers. The app is a cost-effective way to collect valuable data in an environment where research is very expensive and often requires advanced technical skills. With this technology, the process is simplified in a few clicks, whilst users are simultaneously sensitised to wildlife conservation by becoming self-aware through the data they help to collect. The development team ensures that the SIREN App is always operational, and managers maintain the network of users through close relationships.

Analysis

/ Sustainability & Replication

The sustainability of SIREN App is ensured by the regular maintenance and updates on the app, increasing accessibility and ease of use as technology improves globally. Adequate hosting of the website is also a factor in sustainability. The regular engagement of stakeholders ensures their association and comfort with the use of the tool, while ongoing funding strengthens the programme.

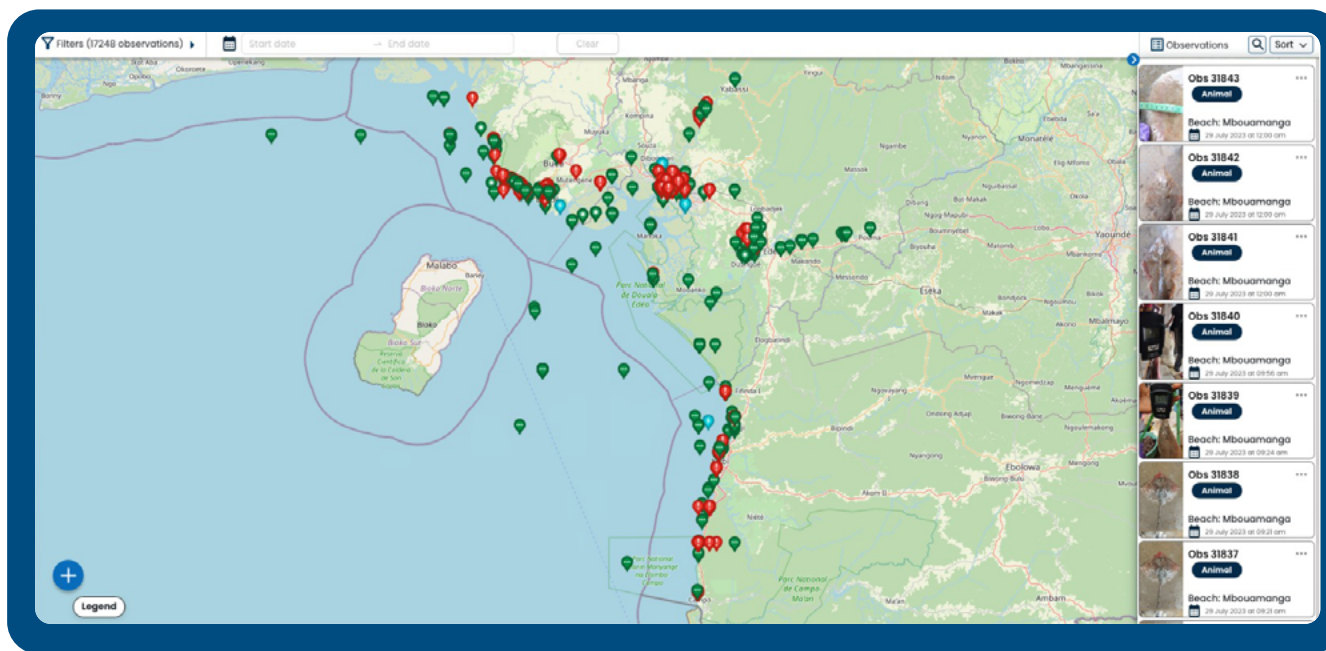
For the SIREN solution to be replicable, organisations must place stakeholders at the centre of their programme, identify the benefits of each partner, explain the goal clearly, and engage them to remove any barriers to contribution.

/ Success factors

- Involvement of stakeholders from the early stages of the programme
- Taking into consideration the needs of stakeholders in the design and update of the app and the web interface
- Use of modern technology and development practices
- Feedback sharing with all stakeholders
- Strong relationships with partners

/ Constraints

- Stakeholders need electronic equipment (especially phones)
- Building a network can be challenging and resource heavy
- Funding and staff time to manage the project.



/ Lessons learnt

Through the implementation of SIREN's good practices, several valuable lessons have been learned that can assist others in implementing similar approaches. These include:

- Human-in-the-loop approach: Incorporating human expertise alongside AI algorithms has enhanced the accuracy and adaptability of the practice. This combination allows for continuous improvement and customisation to different contexts and use cases.
- Collaborative relationship with fishing communities: Working with fishing communities in the early stages and developing a friendly relationship has proven to be instrumental in developing effective solutions and driving positive change.
- Feedback and acknowledgment: Recognising the contribution of each stakeholder and sharing feedback on what has been done, including data collected and how the change impacts social life, is essential for long-term engagement.

Additional resources

AMMCO has developed a manual to facilitate the use of SIREN for new users. The manual also provides insights on how to develop and manage a SIREN citizen science program for the conservation of marine wildlife. The SIREN Citizen Science Guide is downloadable on www.ammco.org

Conclusion

Overall, the SIREN Citizen Science programme is a network of people using the mobile App also called SIREN to document marine wildlife with the goal of supporting conservation action.

The solution is a cost-effective way to take advantage of fisherfolk that are at the best position to encounter these animals most likely. SIREN has offered the possibility to organisations that are interested in the solution to create their project and avoid wasting resources to develop a similar tool and duplicate efforts.



Marine mammals management toolkit



A mobile App and an empowered citizen network to strengthen marine wildlife research and conservation

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Marine protected areas:

- Douala-Edea National Park,
Cameroon
- Lake Ossa Wildlife Reserve,
Cameroon

- Mayange Na Elombo-Campo
Marine National Park,
Cameroon
- (Proposed) Ndongere Park,
Cameroon

Location/geographical coverage:

AMMCO is based in Cameroon
in the Gulf of Guinea (Africa).
Activities are carried on the entire
coastline (402 km) and EEZ (16
557 Km²). We also collaborate
with partners to extend activities
in other countries of West and
Central Africa.

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app



Ocean
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