Creating Effective No-Take Marine Reserves: Systematizing the Steps Needed for Success

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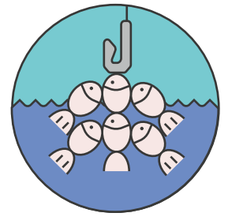
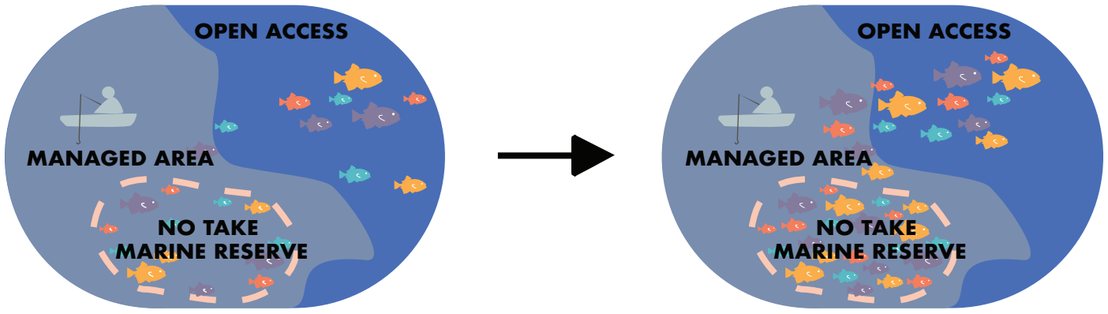
1 Background

Overfishing and deterioration of marine key habitats are two of the major threats for marine conservation and fishery production worldwide. These issues create major impacts on food security, livelihoods, biodiversity, and the long-term sustainability of marine resources. In the last two decades, marine reserves have received increasing attention from the scientific community, policy makers, and high level international bodies as a fundamental tool to help alleviate negative human impacts to marine life and to achieve biodiversity and sustainability goals. Marine reserves are designated areas that prohibit the extraction of one or more target species. They are an effective way to increase stocks, preserve biodiversity, and meet other conservation objectives. Despite the popularity of marine reserves as a management tool, the wide-ranging increase of scientific publications, auxiliary tools, and global experiences quickly complicates the process of establishing them. This is due to intersecting social, economic, ecological, fishery, and political dimensions.





We see this particularly within Mexico as over 30 marine reserves have been established in Mexican coastal waters since 2012. For each of the reserves, the goals, design strategies, and various assessments and evaluations have been highly variable. Even with the wealth of knowledge available on the internet, the research, guidelines, and tools, were not readily available in a systematized and centralized process for them to learn from. Our client, the Fundación Claudia y Roberto Hernandez felt Mexico's resources could be more efficiently utilized through the use of a systematic approach to creating new reserves. This process and applicable tools should then be centralized and available for other countries to use in the future.

4 Results

The tools allow the user to better understand what type of data they will need as they make assessments in each of the phases. As an example, if the user were in the implementation phase and addressing the ecological component, that user could interact with the Fish Forever toolkit. Within this toolkit, there is a marine reserve evaluation tool that users can input the appropriate data to gauge the success and status of the implemented marine reserve.

5 Conclusion

Our project incorporates scientific, empirical, and theoretical material supported by relevant tools to provide a platform that eases the access and usability to organizations wanting to adopt marine reserves as a management tool. It is necessary to constantly reevaluate management strategies to make sure the system is moving toward achieving the desired goal. Creating a no-take marine reserve is a dynamic, complex process but our step-by-step guide allows organizations to identify and utilize existing toolkits to successfully design reserves.

6 Ackowledgement

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7 References

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2 Objectives

The main goal of this project is to help countries and organizations create marine reserves more efficiently by detailing a process to do so. This process is coupled with applicable tools that the users can engage with to better assess, motivate, and scientifically justify their actions. We then made the necessary information, tools, and procedures easily accessible to users by creating a web-based hub. It is our intention that through this hub, users can easily apply this reserve process to their area of interest without having to go through as much trial and error. To achieve this goal, we define several specific objectives:

Analyze and synthesize current marine reserve creation and implementation strategies.

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Assess marine reserve process and status in Quintana Roo, Mexico.

Web-based Hub to guide No-take Marine Reserve design.

3 Approach

To achieve our objectives, we integrated the best practices from Quintana Roo, Mexico with the experience, tools, knowledge, and empirical data published from around the world.

We first surveyed Mexican fishers, NGOs, and funders that work together in a collaborative platform in Quintana Roo, about their perception of no-take marine reserves. Their responses were coupled with our synthesis of a vast amount of literature, including scientific papers, governmental reports, organization reports, books, and other framework guidelines used in other countries. Through this compilation, we deduced four important components to a no-take marine reserve design strategy. These components are: ecological, governance, social, and economic. We identified available and applicable tools that can help better design, implement, and evaluate marine reserves. All this process was structured into a set of phases where all four components are addressed.

We compiled this phasic process into a physical manual that serve as guidelines to creating a single marine reserve or a network of them. Finally, we translated this information into a web-based, centralized hub that organizations can easily access and use.

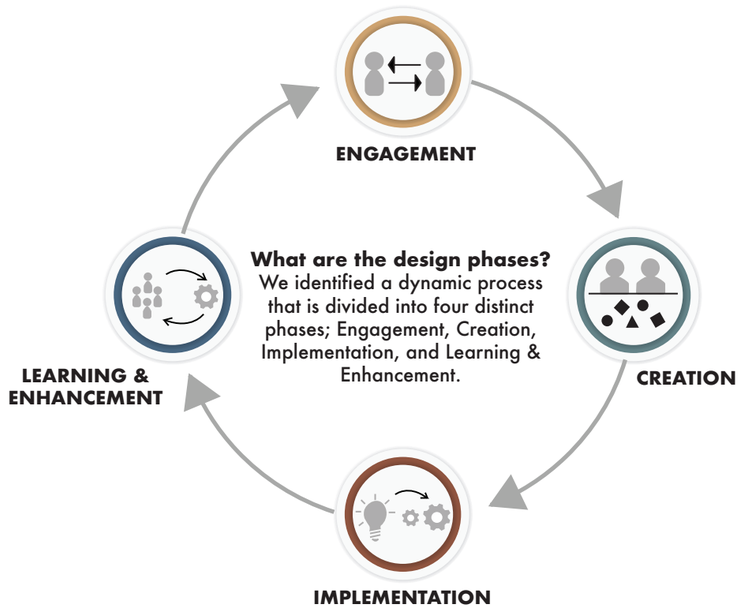
4 Results

ENGAGEMENT:
Interact with local communities and assess social structure. Determine needs and create trusted relationships and gather necessary baseline data.

CREATION:
Design the no-take marine reserve through a participatory approach using local knowledge and scientific analyses.

IMPLEMENTATION:
Employ monitoring, surveillance, and evaluation methods and apply appropriate financial strategies to overcome short-term costs.

LEARNING & ENHANCEMENT:
Provide opportunities to exchange knowledge and experience among communities. Idenitify areas of improvement, where barriers still exist.



ECOLOGICAL: The biology and ecology status of ecosystem will determine the size, location, duration, and connectivity that are critical to their effectiveness.

GOVERNANCE: The rules, regulations, institutions, and power relationships among actors involved in the process of creating a marine reserve.

SOCIAL: The social structure, needs, and motivations of communities directly affected by a no-take marine reserve.

ECONOMIC: The economic strategies that can serve as incentives for fishing communities.

What are the design components?
These phases are then subdivided into four components; Ecological, Governance, Social, and Economic. The user is able to easily navigate through the design process knowing what data, tools, and consideration are needed throughout the entire design of a marine reserve.

Through our literature and Mexican case study analysis, we identified that establishing a marine reserve entails four phases: Engagement, Creation, Implementation and Learning & Enhancement. One of our main findings includes the integration of available toolkits for the user to incorporate into each of the four phases. Here, we have identified a few and show where the user can accompany a certain step with a tool that will make the process more efficient.