

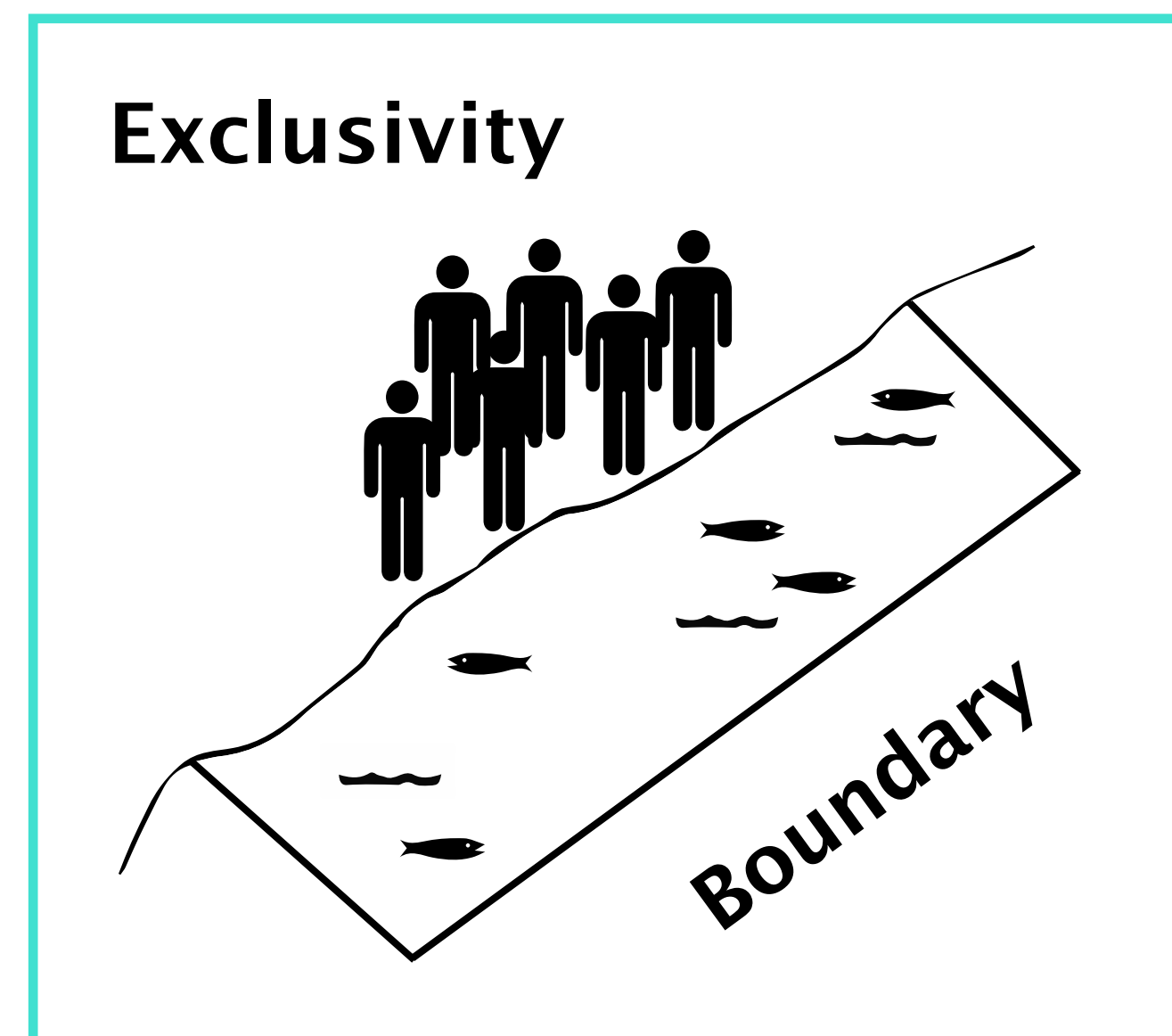
Discover TURFs

A global assessment of Territorial Use Rights in Fisheries to determine variability in success and design

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What are TURFs?



Over one third of all assessed global fisheries are overexploited, despite extensive management strategies aimed at reducing overfishing. Territorial Use Rights in Fisheries (TURFs) are a widely implemented management strategy that gives individuals or communities exclusive access to marine resources within a specific area. When fishers are allotted rights to their resources, they are incentivized to harvest sustainably.

While many researchers have offered loose definitions, there is no single agreed-upon definition for TURFs. Furthermore, although numerous TURF design strategies are hypothesized to lead to success, it is unclear which strategies can achieve management objectives. For the purposes of this analysis, we chose to keep the definition of a TURF broad.

Definition used in study:

A marine area in which individuals or communities are given some level of exclusive access to marine resources within a clearly defined boundary.

Project Scope

- How are TURFs designed and what influences TURF success?**
Document key design features and analyze which may influence a TURF's ability to meet self-defined objectives.
- Where are TURFs located?**
Generate the first comprehensive database and map of where TURFs are located around the world.
- How can these findings be applied?**
Conclusions and recommendations for Fish Forever's global initiatives.

Significance

The results of this project will be a significant contribution to Fish Forever - a collaboration between the University of California, Santa Barbara Sustainable Fisheries Group, Rare, and the Environmental Defense Fund. Fish Forever is working to implement TURFs globally to combat overfishing in small-scale fisheries. Our dataset and analysis address areas of research that are relatively unexplored on a global scale. This research identifies key design features, evaluates TURF success, and can improve communication among fisheries managers.



Methods



We collected data at varying levels of resolution ranging from site-specific TURFs to general trends in TURF management at the country level. We first gathered data by creating and widely distributing a survey on an online platform, SeaSketch, that targeted academics, non-profit personnel, and government officials with first-person knowledge on specific TURFs.



We used available databases and the literature for examples of TURF management. In addition to collecting management and design characteristics for individual TURFs, we also recorded locations and areal extents where possible.



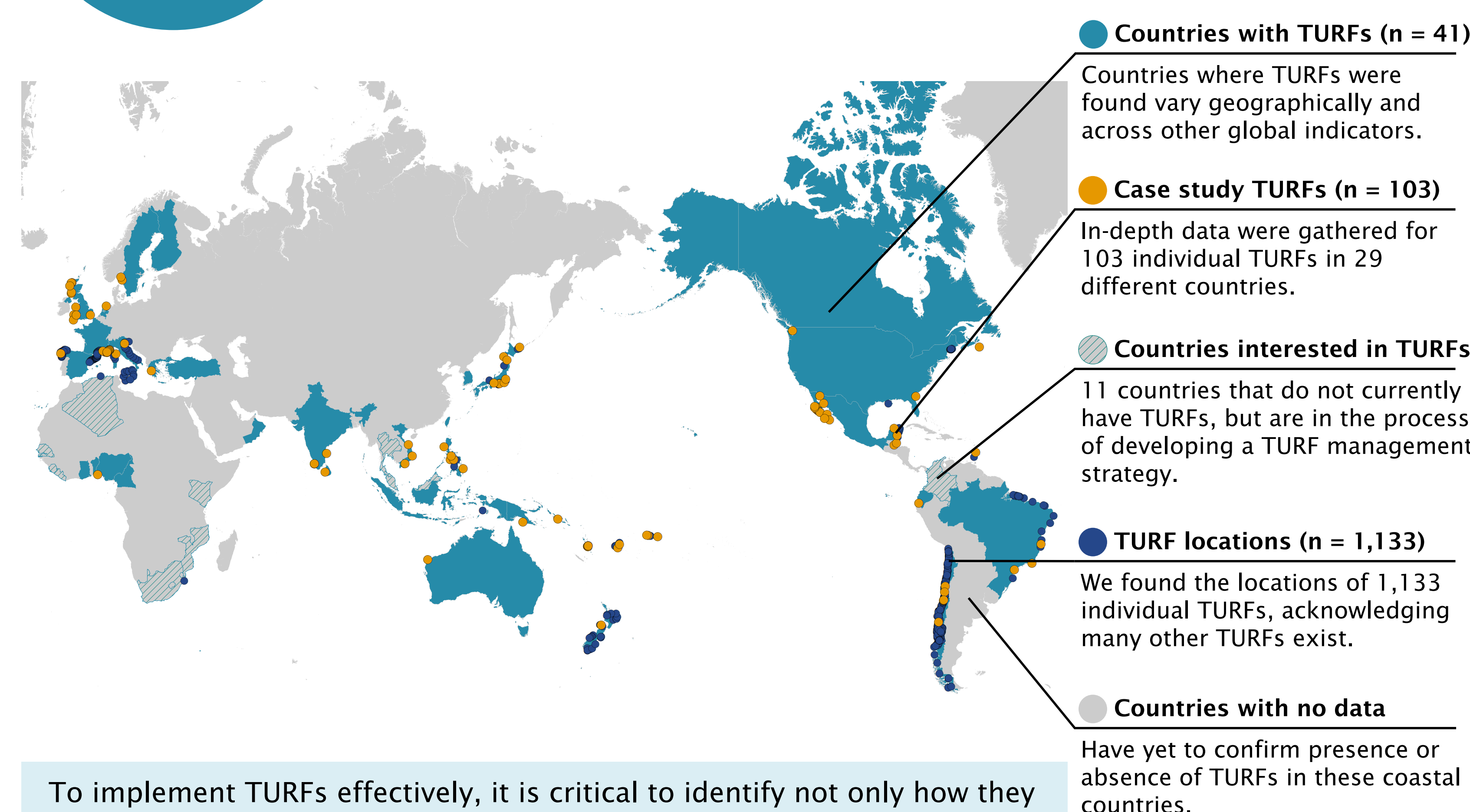
Using regression analyses, we explored relationships between TURF success and key design characteristics, as well as relationships between these design characteristics themselves.

1 How are TURFs designed and what influences TURF success?

No-take Zones	Government & Community Involvement	Size	Species Mobility	Tenure Length	Geographic Enclosure
<ul style="list-style-type: none"> > No-take zones (NTZs) are marine areas where removing resources is prohibited, providing an area where species are protected. > Coupling TURFs and NTZs is thought to benefit TURFs, as fish size and abundance increase inside and around reserves. 	<ul style="list-style-type: none"> > Co-management is where community and government involvement in TURF management are approximately equal. > Co-management allows collaboration between local knowledge and government capacity and is often linked to TURF success. 	<ul style="list-style-type: none"> > TURF size varies considerably around the world and hypotheses differ regarding impacts of size on success. > Larger TURFs can be difficult to enforce, impeding TURF success. However, when targeted species are highly mobile, increasing TURF size may improve success. 	<ul style="list-style-type: none"> > The amount an individual moves within an area varies by species (e.g. most sharks are highly mobile whereas clams are not). > TURFs may be successful when targeting lower mobility species as it is easier to manage a species that stays within the TURF. 	<ul style="list-style-type: none"> > Duration of tenure measures the length of time a fisher has the right to harvest resources within a TURF (e.g., 1 year, perpetuity, etc.) > TURFs that assign harvest rights for longer periods of time incentivize fishers to steward resources over the long-term. 	<ul style="list-style-type: none"> > Some TURFs are enclosed within a geographic feature such as a bay or lagoon, while TURFs along a coastline or offshore are not enclosed. > TURFs not confined by land may have less defined and defensible boundaries, making monitoring and enforcement more difficult.
<ul style="list-style-type: none"> > No relationship detected between presence of NTZ and TURF success. 	<ul style="list-style-type: none"> > Co-managed TURFs significantly related to TURF success.* 	<ul style="list-style-type: none"> > No relationship detected between size and TURF success. 	<ul style="list-style-type: none"> > Targeting low mobility species significantly related to TURF success.* 	<ul style="list-style-type: none"> > Longer tenure length significantly related to TURF success.* 	<ul style="list-style-type: none"> > Geographically enclosed TURFs significantly related to TURF success.*

* Statistically significant based on regression analyses

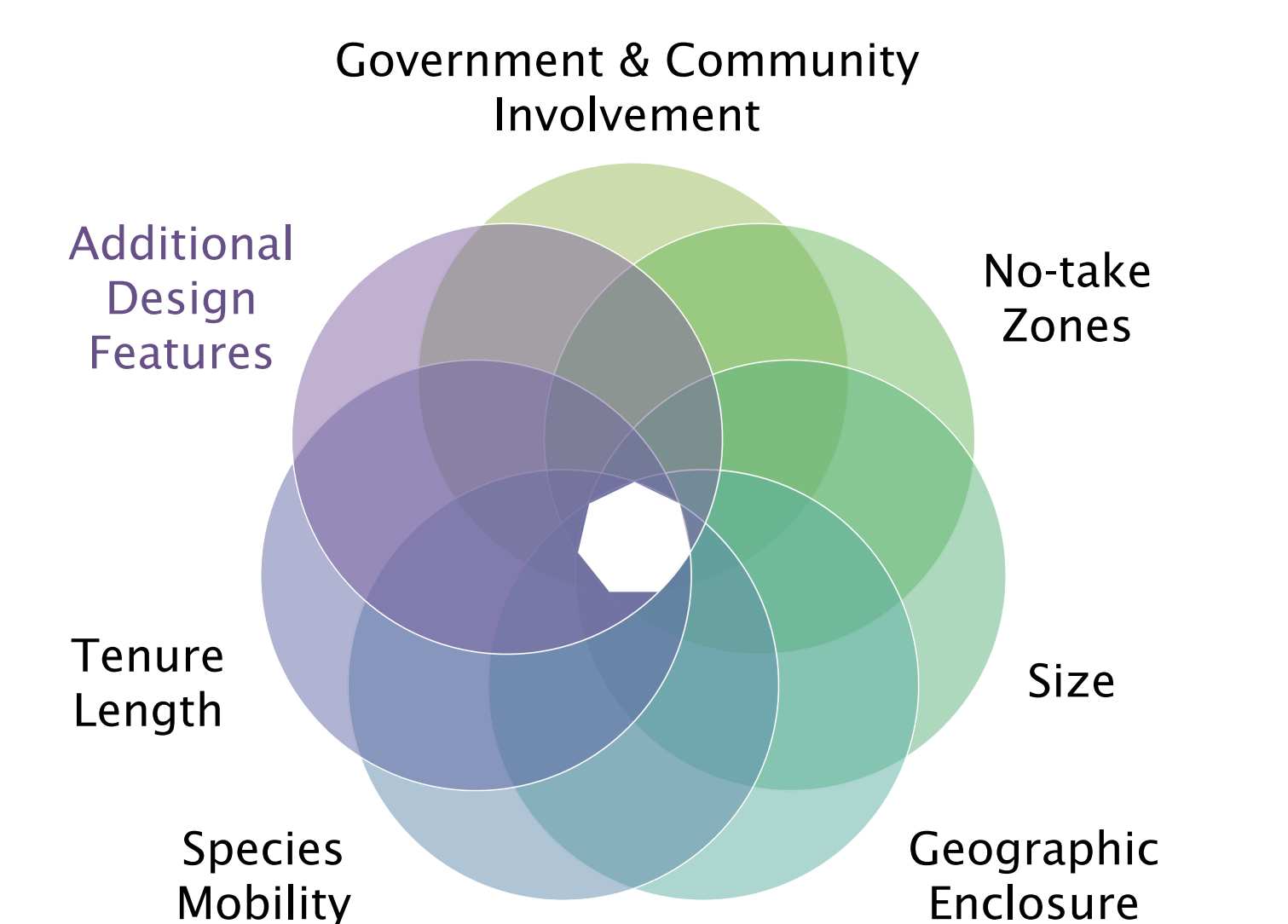
2 Where are TURFs located?



To implement TURFs effectively, it is critical to identify not only how they operate, but also where they operate. Our research documented the locations of 1,133 TURFs in 41 countries around the world.

3 How can these findings be applied?

- > TURFs are a unique management strategy by virtue of their clear boundary and exclusive access. These features allow for innovative design characteristics and management strategies that are not feasible under other forms of fisheries management.
- > Our study examined key design features that are vital to consider when designing successful TURFs. There are also a number of additional design features identified (but not analyzed) that can contribute to a TURF's ability to meet its stated objectives.
- > TURFs are successfully, and unsuccessfully, applied under a diverse set of conditions. There is no one-size-fits-all management solution, but when key design features are supplemented by additional design features that address local needs, TURFs are a flexible, site-specific solution to problems facing small-scale fisheries around the world.



No single combination of design features will guarantee TURF success (open center in diagram), but when design features are selected in combinations that best suit local conditions (intersections of colored circles), success can be achieved.

Acknowledgements

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