

# TURF-Reserves at Isla Natividad

Baja California, Mexico

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## A Regional System of Territorial Fishing Rights in Baja California, Mexico



In the 1940s, the Mexican government granted existing fishing cooperatives (coops) exclusive access to specific benthic marine resources in the coastal waters adjacent to their communities, creating territorial user rights in fisheries (TURFs) along the coast. These TURFs are granted for a period of 20 years with the possibility of extension and are managed at a local level

with limited governmental coordination. Self-governance of the region has proven effective at maintaining strong and economically prosperous fishing communities. On the central coast of Baja California, nine fishing cooperatives collectively form the Federation of Fisheries Cooperatives of Baja California (FEDECOOP). One member cooperative at Isla Natividad has taken steps in recent years to improve their TURF by implementing no-take marine reserves as a strategy to enhance local fisheries.

## An Example of Cooperative TURF Management

The Buzos y Pescadores de Isla Natividad Cooperative, composed of 80 resident members of Isla Natividad, offers a model of successful local TURF management. The cooperative has gained exclusive access to all lobster, abalone, sea snail and sea cucumber resources that lie within the TURF boundaries. The awarded TURF area has been divided up into 42 individual fishing areas (or TURFs) to better manage fishing and monitoring efforts. The Isla Natividad coop controls all local management of the TURF, including enforcement of harvest restrictions, patrolling for illegal fishing activity, and monitoring the populations of targeted species. The coop is responsible for enforcing federal government mandated total allowable catches (TACs) and size limits for all Isla Natividad commercial species including abalone, sea cucumbers, sea snails and lobster. Annual TACs



are further divided among the 42 smaller TURFs surrounding the island. This division of the island's coastal waters into smaller TURFs helps the coop manage fish stocks in real time. The coop does not open all TURFs to fishing at one time. Instead, ten teams of three fishermen, one diver, one captain and one hookah technician work together to fish in a single TURF until they have nearly reached the TAC. When a species' TAC for a given TURF is reached, harvest of that species is prohibited from that TURF for the remainder of the year and the fishermen move to adjacent TURFs to continue fishing. This rotation of open and closed TURFs helps the coop manage at a fine spatial scale and monitor what is happening with the fishery stocks.

## Incorporating Marine Reserves into TURF Management

Through strict TURF management, the Isla Natividad coop has been able to maintain sustainable harvests of lobster, sea cucumbers, and sea snails, but has continued to observe declining abalone populations. After several years of low abalone populations despite efforts to limit harvest, the Isla Natividad coop sought advice from the non-profit conservation organization Comunidad y Biodiversidad (COBI) about the possibility of implementing marine reserves to help rebuild the depleted stocks. In 2006, with collaboration from COBI and the local community, the coop selected two of the 42 TURFs – approximately 8% of the fishing grounds – to be designated as no-take marine reserves. The goal of these designations was to recover depleted abalone populations through spillover from reserves into fishing areas. One of the reserves, La Plana reserve, is located



directly adjacent to the only town on the island, and the other, Punta Prieta reserve, is located on the uninhabited northwestern side of the island. These two areas were chosen for their dense kelp forests (the prime habitat for abalone), and

their favorable ocean currents for transporting juvenile abalone to neighboring fishing grounds to bolster fishable stocks.

## Enforcement

To ensure that the benefits of Isla Natividad's TURF areas are not lost to outside fishermen, all coop members participate in enforcement to ensure exclusivity of TURF areas and elimination of poachers in the marine reserves. Enforcement activities include mandatory patrols of the coastline performed by two coop members every night throughout the entire year. The high level of cooperation within the cooperative, as well as a strong community-wide understanding of the reserves' benefits, has helped maintain compliance with TURF areas and marine reserves.

## Monitoring

One strength of the Isla Natividad coop is its involvement in scientific monitoring of fishery stocks. The coop has monitored its fishing grounds before and after the establishment of the two marine reserves. Since the implementation of the marine reserves, COBI and the non-governmental organization (NGO), Reef Check collaborate to train local fishermen to perform underwater surveys of key species in the reserves and the TURFs. In addition to the underwater surveys, coop fishermen are responsible for gathering on-board information on species abundance, size, reproductive status, and distribution within the marine reserves and in selected fishing areas. These data are used to help inform management decisions.



areas have been affected by the unusual ocean conditions. Despite this finding, data from 2010 show that abalone density in that year was twice as high in the reserves as in fished areas, and the rate of decline was half as fast. Abalone within the reserves also showed a wider size distribution, indicating a more robust population and a higher reproductive potential. In addition, juvenile recruitment was observed to be higher within the reserves as fishing grounds adjacent to the reserves contained more recruitment than fishing areas farther from the reserve, indicating a spillover effect from the reserves. Although fishermen are not yet experiencing large abalone harvests since implementation of the reserves, without these no-take areas the abalone population at Isla Natividad may have suffered an even more drastic decline with a smaller chance of rebuilding.



Both lobster and sea cucumber populations at Isla Natividad have grown in the past five years, supporting the local fishing industry while the abalone populations recover. Recent surveys performed by COBI show that the marine reserves have led to significantly larger and more abundant lobsters inside and on the border of the reserves when compared to open fishing areas. While the sea cucumber population around the island has grown, it is not yet determined if the reserves have been a contributing factor to the increase. Sea snails have maintained stable populations throughout Natividad's waters but surveys have revealed increased sizes within



the reserve as well. In March of 2012 members of the coop met with COBI scientists to discuss the future of the marine reserves in Natividad. A consensus was reached to keep both reserves for another 6 years.

## Effectiveness of TURF-Reserve Management

In the six years since the La Plana and Punta Prieta reserves have been closed to fishing, their abalone populations have shown positive responses to protection. However, improvements in the population are likely obscured by the effects of an unusual influx of cold, low-oxygen water that the region experienced in 2009 and 2010. COBI has monitored abalone populations both inside and outside the reserves since 2006, with results suggesting that abalone stocks in both

### For more information:

Micheli, F., et al. (2012). Evidence that marine reserves enhance resilience to climatic impacts. *PLoS ONE*. 7(7): 1-8.

"Proyecto piloto de reservas marinas en Isla Natividad." (2005). Comunidad y Biodiversidad (COBI).

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"Building ocean resilience: An incentive based approach for marine conservation in Mexico." (2011). Comunidad y Biodiversidad (COBI).

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