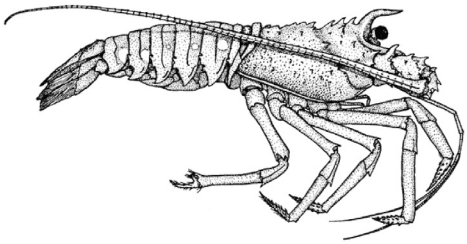
CATCH SHARES IN ACTION



Mexican Baja California FEDECOOP Benthic Species Territorial Use Rights for Fishing System

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SEASALT
Secure
Exclusive
All sources
Scaled
Accountable
Limited

CATCH SHARES IN ACTION

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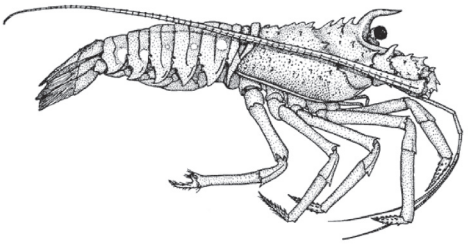


SPECIAL DESIGN FEATURES

MULTI-SPECIES, GROUP-ALLOCATED,
AREA-BASED, NON-TRANSFERABLE

The Baja California Regional Federation of Fishing Cooperative Societies (FEDECOOP) is a group-allocated, area-based catch share, or Territorial Use Rights for Fishing (TURF), program. FEDECOOP consists of 13 fishing Cooperatives that collectively manage 10 TURFs to promote sustainable harvests, increase market access and power and provide stability to fishermen and fishing communities. The catch share program is a model for coordination across multiple Cooperatives and TURFs to achieve fishery goals. Key design features include voluntary no-take reserves to increase productivity and protect vulnerable fish species and the evolution of FEDECOOP to coordinate activities and provide services to multiple Cooperatives and TURFs.

SYNOPSIS

In 1992, the Mexican government granted nine area-based concessions, or TURFs, along the remote west coast of Baja California, and granted a tenth further south in 2000. A total of 13 Cooperatives from 10 associated villages currently manage these areas. These villages are highly dependent on their fishery resources and actively co-manage the TURFs with the government. To ensure coordination, they have formed an overarching federation, FEDECOOP, and are an example for sustainable management. The TURFs were initially established for Baja spiny lobster (*Panulirus interruptus*). Over the years, additional species have been added, including abalone (*Haliotis fulgens* and *H. corrugata*), sea cucumber (*Stichopus parvimensis*) and turban snail (*Astrea undosa*).

The fishery is a model for appropriately scaling management to meet biological and social goals. Government agencies and the regional Cooperatives under FEDECOOP work together to establish catch limits and manage harvests across the entire fishery (Vega-Velazquez, 2008). FEDECOOP Cooperatives have continually complied with catch limits for all four main target species. Total FEDECOOP spiny lobster landings in 2011 were 1,898 metric tons (Scientific Certification Systems, 2011), and the annual value is approximately U.S. $24 million (Vega Velazquez et al., 2008). As of 2004, the program included 1,300 active fishermen who use 230 skiffs to deploy more than 13,000 lobster traps each season from September to February. An estimated 30,000 people benefit directly from FEDECOOP's lobster fishery operations (INAPESCA, 2004).

Road to a Catch Share

The Pacific coast of Baja California is a remote and isolated area, characterized by poor infrastructure and scarce water resources. Foreign enterprises largely dominated fishing along the coast in the early 20th century, targeting benthic species such as lobster and abalone. In the mid-1930s, the Mexican government began a national program for the formation of cooperatives in agriculture and fishing. The informal fishing camp communities along the Pacific coast of Baja were thus converted into the first fishing cooperatives in the area (Ponce Diaz et al., 1998). In 1948, under the General Fisheries Law, the cooperatives were granted fishing permits for lobster and abalone, although poaching by unlicensed fishermen continued to be a problem despite the legislation (Espinoza-Tenorio, 2010).

In the early 1990s, the cooperatives appealed to the government for secure, exclusive access to their fishing resources in exchange for meeting clear performance goals. This was especially important to these communities because they were highly dependent on their fishing grounds. In 1992, the Mexican government awarded nine geographically defined management areas, or TURFs, to the 13 Cooperatives of FEDECOOP, an existing federation of fishing camps in the region. A tenth TURF was granted in 2000. Each management area was a 20-year "species concession", or "concesión pesquera", for Baja spiny lobster and other benthic species (Tindall, 2012). FEDECOOP actively co-manages the TURF system with the National Commission on Aquaculture and Fisheries (CONAPESCA) and the National Fisheries Science Institute (INAPESCA).

Performance

The FEDECOOP TURF program is a model of sustainable, small-scale fisheries management, and is meeting biological, economic and social goals. In recognition of this success, the government renewed FEDECOOP's concessions in 2012 for an additional 20 years. The catch share program has largely been seen as having instilled a greater sense of stewardship among fishermen, improving economic well-being and increasing social cohesion.

Biological goals have also largely been met as the Cooperatives have stayed within catch and effort limits for all high-value species in their TURF system and increased coordination on important stocks that exist across all TURF areas. As a result, FEDECOOP has seen sustainable increases in catch and fishing effort. Additionally, the catch share program has been certified sustainable by the Marine Stewardship Council.

Many Cooperatives have also implemented voluntary no-take zones, which show increased larval production, larger lobsters and higher stock density than fished populations outside the reserve boundaries (Micheli et al., 2012). Additionally, the no-take zone system has helped the abalone stock recover, improved juvenile recruitment and increased resiliency to changes in the environment (Micheli et al., 2012). Other cooperatives in the Baja Peninsula region now look to FEDECOOP as an example of successful TURF management.

STEP 1 IN ACTION

Define Program Goals

FEDECOOP established a series of fishery management goals for the catch share program including biological, economic and social objectives. These goals have evolved along with the catch share and presently include:

- Replenishing and protecting stocks within their TURF boundaries
- Increasing productivity, market power and access to new markets
- Providing stability for fishermen, and infrastructure and services for the fishing community

STEP 2 IN ACTION

Define and Quantify the Available Resources

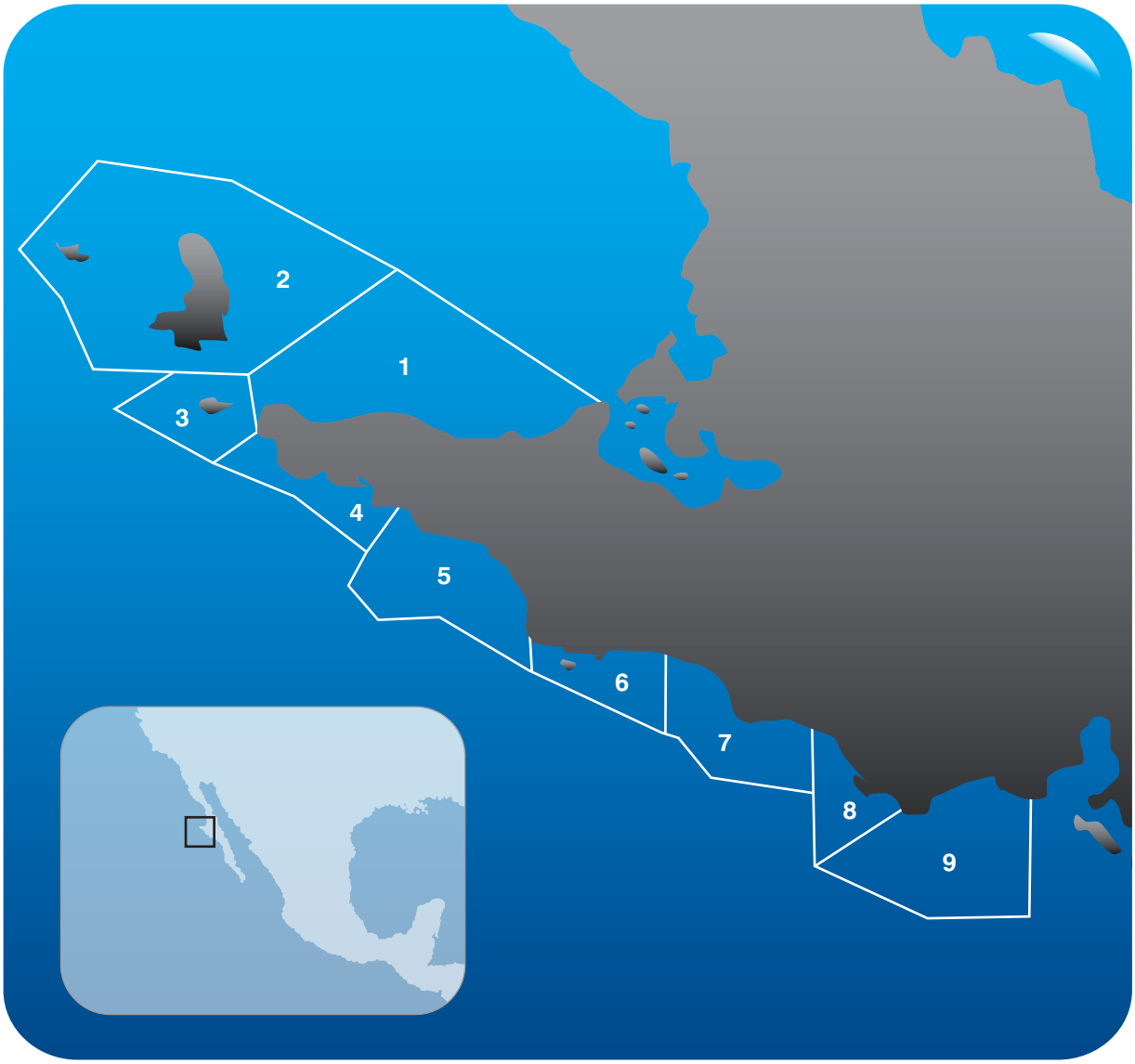
FEDECOOP is a multi-species catch share program that covers harvests of all benthic species within each Cooperative's TURF. Cooperatives primarily target Baja spiny lobster, also called red rock lobster (*Panulirus interruptus*), pink (yellow) abalone (*Haliotis corrugata*), green (blue) abalone (*H. fulgens*), sea cucumber (*Stichopus parvimensis*) and turban snail (*Astrea undosa*). The program also manages other species such as sea urchins (*Strongylocentrus fransciscanus* and *S. purpuratus*) and kelp (*Macrocystis pyrifera* and *M. undosa*). Finfish, including halibut, are caught within the TURFs but are not formally part of the catch share program and are regulated separately.

TURF borders were determined by biological and social factors. Important factors included biological assessments of species' biomass, habitat, reproduction and recruitment, as well as the Cooperative's proximity on land. All FEDECOOP TURFs are located within the Vizcaino Biosphere Reserve, and are subject to legislation administered by the Mexican National Commission for Protected Areas (CONANP).

Cooperatives are responsible for controlling fishing mortality within their TURFs. The primary controls on fishing mortality include catch limits and effort caps, depending on the species. Sustainable limits are set based on assessments conducted by INAPESCA and biological monitoring conducted by the Cooperatives. Effort caps limit the number of traps that can be used and are set annually for the spiny lobster stock (Vega Velazquez et al., 2008). Catch limits are set for other high-value benthic species within each Cooperative's management area (see Figure 1). Additional regulatory measures include minimum size limits, area and temporal closures, protection for females carrying eggs and escape windows in traps to protect reproduction and recruitment.

Voluntary no-take zones have also been implemented as a result of collaboration between FEDECOOP, academic institutions and non-profit organizations. For example, the Cooperative of Buzos y Pescadores on the island Isla Natividad established two no-take zones to replenish and protect target stocks, especially abalone, which had been in decline since the 1960s (F. Micheli, personal communication, 2012).

FIGURE 1 | *Map of FEDECOOP Concessions and Certified Cooperatives*



(1) La Purisima, (2) Pescadores Nacionales del Abulon, (3) Buzos y Pescadores, (4) Bajía Tortugas, (5) Emancipación, (6) California de San Ignacio, (7) Leyes de Reforma, (8) Progreso, (9) Punta Abreojos (Perez-Ramirez, 2012)
Note, this map does not show the concession of Puerto Chale, which is located farther south.

STEP 3 IN ACTION

Define Eligible Participants

FEDECOOP is a Cooperative catch share program under which privileges are granted by the Mexican government to groups generally consisting of local community members. Cooperatives maintain eligibility by renewing membership in FEDECOOP and paying a fee each year (M. Ramade, personal communication, 2012).

Cooperative membership is determined by individual Cooperatives within FEDECOOP. Each Cooperative determines who may fish and on which fishing team or skiff. To be eligible to participate in a Cooperative, fishermen must hold a valid fishing permit issued by CONAPESCA and have complied with all fisheries laws. Cooperatives have access to a set amount of licenses and distribute them among members. Cooperatives are also responsible for creating their own participation rules regarding new entrants and eligibility. For example, new entrants are allowed in Buzos y Pescadores Cooperative through an apprenticeship process in which prospective members must work as an "extra" for 10 years before becoming a full voting member. An apprentice's work initially includes driving product to market, building lobster traps and working in the processing plant. Extras may eventually be allowed to fish (C. Calderon, personal communication, 2012).

Groups of fishermen may also enter the fishery by creating a new Cooperative and joining FEDECOOP. To be eligible, a group of fishermen may form a fishing cooperative under Mexican law and invite the FEDECOOP assembly to attend one of their cooperative meetings. If the FEDECOOP assembly agrees the new cooperative is a good fit, their representatives are invited to attend a FEDECOOP annual meeting where a majority vote is taken to determine admission of the new group.

STEP 4 IN ACTION

Define the Privilege

The FEDECOOP Cooperatives receive area-based privileges that confer secure and exclusive access to harvest benthic species within each concession's defined territory. Privileges are granted for 20 years with a strong assumption of renewal.

Each year, CONAPESCA determines catch or effort allocations to each Cooperative for all four high-value species. Through assembly mechanisms, each Cooperative then determines which fishermen are eligible to receive an individual allocation. For example, INAPESCA recommends to CONAPESCA a limit on the number of traps permitted to target spiny lobster for the entire Baja California region. A proportion of the total number of traps permitted is then allocated to FEDECOOP Cooperatives based on the sub-stock fished in their region. This allocation is further divided and assigned to the Cooperative(s) that manages each of the concessions (INAPESCA, 2012).

Each Cooperative typically manages its own allocation to maintain accountability. For example, effort allocation for lobster normally consists of a set number of traps per boat. The Cooperatives grant trap limits to each skiff, and the associated fishing team is responsible for reporting its catch (F. Micheli, personal communication, 2012). The annual allocation unit for sea cucumber, turban snail and abalone is by weight (metric kilograms or tons). Mexican law does not allow temporary transfer of concessions, but the title of the concession can be passed down to another name in certain rare cases (Diario Oficial de Mexico, 2012).

STEP 5 IN ACTION

Assign the Privilege

In the early 1990s, local fishing cooperatives appealed to the government for secure, exclusive access to the marine resources adjacent to their communities. Based on their historical use of the areas, the Mexican government granted nine area-based concessions to 13 Cooperatives in 1992. Each area is a 20-year "species concession", or "concesión pesquera", for Baja spiny lobster and other benthic species (Tindall, 2012). A tenth TURF was granted in 2000. The Cooperatives receive the long-term concessions and collectively manage the system through FEDECOOP.

Annual allocations of effort and catch limits are determined through negotiations between FEDECOOP and INAPESCA. Before the fishing season begins in March, INAPESCA announces quota and effort limits for the year (F. Micheli, personal communication, 2012). FEDECOOP plays a role in ensuring fair allocation of fishing rights by holding bi-annual meetings in which Cooperative leaders discuss the catch and trap limits, stock assessments and compliance.

STEP 6 IN ACTION

Develop Administrative Systems

Administrative systems for the catch share program are established and conducted by the Mexican government, FEDECOOP and the individual Cooperatives that hold TURF concessions. Close collaboration occurs to promote co-management and ensure effective administration of the program.

Cooperatives are governed individually and through the umbrella organization of FEDECOOP. Each Cooperative has its own organizational structure consisting of bylaws, formal leadership and administrative roles. Cooperatives are in charge of organizing their own members and holding assemblies to set goals and uphold or modify bylaws. FEDECOOP functions as an umbrella organization to ensure best practices in administration across TURFs and to coordinate market initiatives, such as Marine Stewardship Council certification.

Coordination across Cooperatives and TURFs is primarily conducted through FEDECOOP. FEDECOOP was initially established to represent fishing Cooperatives to the government, but has evolved over time. Today, it also provides increased cohesion, coordination, leadership and administration of the Cooperatives' commercial products. FEDECOOP helps maintain the catch share by coordinating management of the TURF system with government authorities and representing the Cooperatives' interests in government committee and consultation meetings.

Each Cooperative manages its day-to-day fishing activities and is responsible for ensuring compliance with catch and effort limits, enforcement and catch accounting, and for helping with stock assessments (F. Micheli, personal communication, 2012). Cooperatives carefully monitor landings and fishing activity of members. Fishermen from each Cooperative land their products at designated shore-side processing plants. Each

fisherman offloads lobster into holding pens or directly to a Cooperative-owned plant that serves one to three Cooperatives. Pay is distributed to the fishermen at that time. To deliver to a plant, fishermen must have good standing in their Cooperative. Because Cooperatives must report to multiple agencies, careful records are kept of daily activity. Fishermen keep logbooks of fishing effort, trap depth, the number of traps used and number of legal and undersized lobsters caught (Leal et al., 2008).

Cooperatives also handle enforcement. They invest an estimated U.S. $1 million collectively each year in equipment such as radar, radio systems, boats, night vision goggles, road surveillance and checkpoints to monitor the TURF areas. The Cooperative also conducts 24-hour surveillance of the no-take zones to protect against poaching or illegal activity (Dawson, n.d.). All enforcement activities are conducted in close collaboration and partnership with authorities from CONAPESCA and the Federal Attorney for Environmental Protection (PROFEPA), who prosecutes and penalizes offenders. In order to deter illegal fishing, FEDECOOP successfully lobbied for stricter penalties in the Federal Penal Code. Based on this code, fishermen charged with illegally fishing abalone or lobster cannot be released on bail and must face criminal charges (Marine Stewardship Council, 2010).

FEDECOOP and Cooperatives also partner to perform annual biological assessments of the TURFs and no-take zones. FEDECOOP employs a head biologist, and each Cooperative employs a technician biologist to assist with data collection and provide advice. For example, divers from the Cooperative Buzos y Pescadores on Isla Natividad survey inside and outside the no-take zones and collect data. This enables them to assess the reserve's effect on critical habitat and larval recruitment and whether their no-take zones are helping increase productivity in surrounding fishing areas. These annual assessments help FEDECOOP retain Marine Stewardship Council certification for the spiny lobster fishery.

Costs accrued by each Cooperative include concession fees, a small payment for each registered skiff and FEDECOOP membership fees. Additionally, each Cooperative funds its own monitoring, as well as data collection for stock assessments (Leal et al., 2008). The Mexican government supports the yearly assessment of target stocks by assigning an INAPESCA scientist, while the Cooperatives provide any additional needed manpower.

STEP 7 IN ACTION

Assess Performance and Innovate

Over the 20-year history of the program, FEDECOOP has largely met biological, economic and social goals. Due to this success, as demonstrated through yearly stock assessments, the 20-year concessions were renewed in 2012 (Diario Oficial de Mexico, 2012). Additionally, the catch share program has helped FEDECOOP be the first small-scale fishery awarded Marine Stewardship Council certification.

The adaptive co-management arrangement has allowed FEDECOOP Cooperatives to innovate and improve program performance over time. Since initially forming and receiving TURFs, FEDECOOP has taken a number of steps to improve the design of the catch share. The Cooperatives have voluntarily implemented no-take zones to

increase productivity of target stocks and protect vulnerable species, such as abalone. Additionally, FEDECOOP has coordinated management across Cooperatives, which is especially important for lobster as the stock inhabits all 10 TURFs (McCay et al., in press).

Individual Cooperatives have also innovated to improve the economic performance of the system. The Cooperative Pescadores Nacionales de Abulón, located on the island Isla Cedros has its own state-of-the-art plant on the island that processes fresh abalone in a variety of methods (whole, cut, marinated, ground, etc.) (Cooperativa Pescadores Nacionales de Abulón, 2012). The commercial success of the Cooperative has greatly aided the island community and brought economic prosperity to local fishermen.

Despite high levels of prosperity and resource health, some challenges persist. Illegal fishing by outsiders still occurs, especially in the lobster and abalone fisheries. In 2005, illegal catch of abalone totaled approximately 27% of the official catch, worth about U.S. $5 million (Castillo, 2012). Continued innovations and investment in enforcement are needed to address this challenge. Overall, FEDECOOP provides a model for small-scale fisheries management through TURFs, and maintains an adaptable co-management arrangement used to address current and future challenges.

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