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# THE REFORM OF THE PARMA LICENSING SYSTEM: THE FIRST STEP IN ELIMINATING THE RACE FOR FISH IN THE GALAPAGOS MARINE RESERVE

*MAURICIO CASTREJÓN*

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Photograph: Mauricio Castrejón

# The reform of the PARMA licensing system: The first step in eliminating the race for fish in the Galapagos Marine Reserve

Mauricio Castrejón[1,2]

[1]Dalhousie University, [2]WWF Galapagos Program / Consultant

## Introduction

Since the enactment of the Special Law for the Conservation and Sustainable Use for the Galapagos Province (LOREG, for its initials in Spanish) in March 1998, various management measures have been established to control access to and exploitation of fishery resources in the newly created Galapagos Marine Reserve (GMR). These measures have included a ban on industrial fishing within the GMR, the establishment of a moratorium on the entry of new fishers, and the creation of what is known worldwide as a "limited-entry program."

The establishment of a moratorium on new licenses and fishing permits and of a limited-entry program (i.e., a system of licenses and fishing permits known as PARMA, a Spanish acronym for Artisanal Fisher of the Galapagos Marine Reserve) were useful management measures to slow down the exponential growth in fishing effort. However, their implementation has not been sufficient to eliminate the intense competition between fishers to obtain the greatest amount of resources in the shortest possible time. Such behavior, known globally as the "race for fish," occurs because each fisher acts for themself using the following logic: "the sea cucumber/lobster/fish that I do not catch today could be caught by someone else tomorrow." This logic encourages fishers to disregard established management measures (e.g., prohibition of catching gravid females, minimum landing size, etc.), particularly when they have immediate economic needs. The race for fish has resulted in the over-capitalization of the Galapagos fishing sector. It has also led fishers to fish under dangerous conditions and keeps them from planning their fishing operations based on market demand. This has resulted in reduced economic efficiency of fishing and over-exploitation of both the sea cucumber and lobster fisheries.

To solve these problems and eliminate the race for fish, it is necessary to design and adopt a new fisheries management system that will help to align economic incentives for fishers with resource conservation. The elimination of the race for fish is one of the expected results of the implementation of the Fishery Chapter of the GMR Management Plan, which was adopted by unanimous consent by the Participatory Management Board (PMB) and the Inter-institutional Management Authority (IMA) in January 2009. This article has two objectives: 1) analyze the causes that have hindered the elimination of the race for fish in Galapagos, and 2) provide recommendations for the design and implementation of a new fisheries management system.

## Why has it been impossible to eliminate the race for fish in Galapagos?

Efforts to eliminate the race for fish in the sea cucumber and lobster fisheries have failed due to a series of closely related circumstances (Castrejón, 2011 & 2012), including:

1. **Delayed implementation of the moratorium on new licenses and fishing permits.** The opening of the sea cucumber fishery without the existence of a long-term policy and a solid legal and institutional framework for fisheries management resulted in a rapid over-capitalization of the fishing sector in Galapagos between 1999 and 2002. For example, the number of fishers registered by the Galapagos National Park Service (GNPS) increased from 613 to 1059 between 1998 and 2002 (Figure 1), while the number of fishing vessels increased from 222 to 446. Meanwhile, the moratorium on new licenses and fishing permits was applied late, four years after being approved, when fishing capacity was already excessive. This fact, along with the promise of generating new "alternative livelihoods" and an inadequate definition of "moratorium" within the legal framework (the children of fishers have always been able to obtain a PARMA fishing license), led to the intensification of the race for fish and the resulting over-exploitation of the sea cucumber and lobster fisheries.

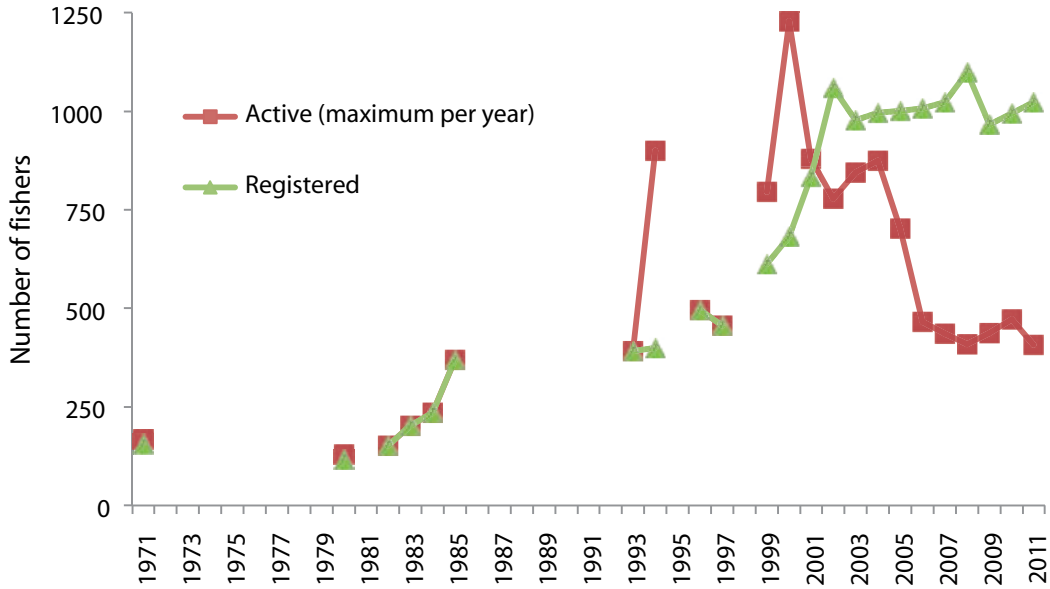


**Figure 1.** Number of registered and active fishers in the GMR by year. Source: Castrejón (2012) and Ramírez *et al.* (2012). Note: the maximum number of active fishers represents the highest number of active fishers registered by year, either in the spiny lobster or sea cucumber fishery.

2. **Inadequate design of the PARMA licensing system.** The PARMA licensing system does not allow adjusting the fishing effort according to the productive capacity of each fishery. Licenses and fishing permits allow the holders to participate in all fisheries. Thus, fishing licenses are issued without regard for the conditions of fishery resources or the labor requirements of a specific fishery or fishing port. In short, enrolling new fishers on the fishing register to address the lack of labor in potentially underutilized fisheries (e.g., offshore fishing) runs the risk of indirectly increasing the fishing effort on overexploited fisheries (e.g., sea cucumber).

   To understand and solve this problem, two facts must be considered (Castrejón, 2011 & 2012):

   a. The exploitation status of each fishery in Galapagos varies by species. There are over-exploited resources (e.g., sea cucumbers) and some potentially underexploited fisheries (e.g., off-shore fishing). Consequently, each fishery must be managed according to its exploitation status and specific labor requirements.

   b. Most Galapagos fishers are "generalists," that is, they exploit various fishery resources. However, this does not imply that every fisher participates in all available fisheries. It is estimated that 40% of active fishers (e.g., divers) only participates in sea cucumber and lobster fisheries, dedicating the rest of the year to other types of economic activities outside fishing. This creates an unbalanced distribution of labor supply in each fishing port.

3. **Inadequate allocation of licenses and fishing permits.** The decline in the profitability of sea cucumber and lobster fisheries has resulted in the gradual abandonment of fishing (Figure 1). The maximum number of active fishers was 408 in 2008 (Ramirez *et al.*, 2012). This number represented only

37% of the total number of registered fishers in the same year (1099, as recorded in the fishing register). The number of active fishing vessels has decreased in the same proportion. For example, the maximum number of registered vessels actively fishing in 2008 was 161 (Castrejón, 2011), which represents only 36% of the 446 fishing boats registered by the GNPS for that year.

Despite a significant abandonment of the sea cucumber and lobster fisheries, the number of registered fishers has not decreased significantly (Figure 1). In fact, this number increased from 1023 to 1099 between October 2007 and December 2008. However, the percentage of active fishers declined during the same period from 43 to 37%. This implies that the children of fishers tend to enroll in the fishing register without any immediate intention to fish, but rather to gain access to the alternatives created for the fishing sector by the GNPS and nongovernmental organizations (NGOs), such as Experiential Artisanal Fishing and Tourism Operation Permits.

According to information provided by the Program for Conservation and Rational Use of Marine Ecosystems (CUREM, for its initials in Spanish), the number of fishers and fishing vessels registered in 2011 decreased to 1023 and 420, respectively, through the implementation of a series of administrative actions by the GNPS (Castrejón, 2012). However, the percentage of active fishers is still quite low, with only 39% in both cases (408 fishers and 164 fishing boats; see Ramirez *et al.*, 2012). This situation underlines three important issues: 1) the fishing register is overextended, making it ineffective as a tool for assessing the actual structure and dynamics of the fishing sector; 2) many fishing licenses are being issued to people who do not depend on fishing as their main source of livelihood, and who probably are not interested in participating in its co-management; and 3) the special fishing regulation lacks adequate mechanisms to change the number of licenses and fishing permits as a function of the current number of active fishers and fishing boats. The lack of such a mechanism has resulted in some individuals remaining on the fishing register even when they have little or no interest in fishing permanently.

Regarding point number three, Article 23 of the current fishing regulation states that a fisher will be eliminated from the register in the following cases:

a. Not having renewed their PARMA license for two consecutive periods.
b. Not having made artisanal fishing their main livelihood for four years.
c. Death of a fisher.
d. Deciding to remain in the tourism sector 18 months after receiving a tourism permit.
e. Voluntary surrender of fishing license/permit.
f. Having been sanctioned by the GNPS more than twice for serious or very serious violations, as set out in the general regulations of LOREG.

Under current regulations, it is nearly impossible to eliminate excessive and inactive fishing capacity because: 1) a person may renew their PARMA license even if they have only fished once in four years (fishing regulations do not specify criteria for determining whether or not fishing is the main livelihood of an individual); 2) tourism permits were issued without considering the level of activity of fishers and consequently many of these permits were allocated to people who do not depend on fishing as their main livelihood, thus eliminating the possibility of reducing the effective fishing effort in overexploited fisheries; and 3) it is unlikely a person will willingly give up their PARMA license or lose it for having committed a serious or very serious violation, in large part because these types of violations are not clearly defined in the LOREG or in the fishing regulations.

In fact, it is impossible to eliminate any fishing license, as Article 69 of the current fishing regulations states that:

*"The Galapagos National Park Service (GNPS) will allow the enrollment of a fisher to the artisanal fishing register, only when a place is available. It will be understood that an available place exists whenever a fisher has been eliminated from the artisanal fishing register, in accordance with Article 23 of this regulation. Also the enrollment of new fishers will be allowed, only if they are direct descendants of fishers who are currently inscribed in the register."*

This implies that the net number of fishers eliminated from the fishing register between 2008 and 2011 (~76) could be replaced by a similar number of new fishers, who most likely will be active in fisheries. This situation has already happened to some degree. In 2007, at the request of the fishing sector, the IMA authorized the entry of 26 new fishers to the fishing register (see Resolution 008-2007). This provides evidence that the legal framework itself encourages the re-activation of inactive fishing capacity without proper planning. This situation not only promotes an increase in the effective fishing effort for both sea cucumber and spiny lobster fisheries, but also overrides any previous effort made by the GNPS and NGOs to reduce fishing capacity and effective fishing effort by developing alternative livelihoods for the fishing sector.

The lack of adequate legal mechanisms to reduce the number of licenses and fishing permits based on the actual number of active fishers and fishing boats has other implications:

a. The current inactive fishing capacity could gradually become reactivated if the profitability of fishing activity increases due to resource recovery or improvements in marketing systems. This would once again put the fisheries (especially sea cucumber and spiny lobster fisheries) at risk of over-exploitation.

b. Most children of fishers have no interest in fishing (Avendaño, 2007). Consequently, the fishing sector, whose average age was 36 years in 2006 (Castrejón, 2011), will continue to gradually age. This will cause a decrease in the number of fishers with PARMA permits, and consequently an increasing lack of labor, particularly in whitefish and offshore fisheries.

c. The lack of labor in whitefish and offshore fisheries will gradually generate greater pressure to enroll new fishers in the fishery register. If this continues to occur, under the current structure of the PARMA licensing system, there is a high risk of indirectly increasing fishing effort in overexploited fisheries, such as sea cucumber.

## What benefits would be generated by a comprehensive reform of the PARMA licensing system?

To eliminate the race for fish, a necessary first step is a comprehensive evaluation and reform of the structure and function of the current system of PARMA licenses and fishing permits, in order to establish mechanisms within the legal framework that will allow a reduction in the number of fishing licenses and permits, based on the current number of active fishers and fishing boats (Table 1). This is of particular importance given that the current fishing regulation states that "within six months from the date of publication of these regulations in the Official Register, the GNPS together with the fishing sector will establish, by an administrative resolution, the procedures and requirements that would ensure effective enrollment of new fishers in the fishing register." Considering that the current fishing regulation was published in Official Register No. 483 on December 8, 2008, the PARMA licensing system should have been evaluated and fully reformed before June 8, 2009. However, this has not yet occurred.

**Table 1.** Potential benefits from reforming the PARMA licensing system of the GMR.

| Benefit | Effect |
|---|---|
| Active fishers, those that actually fish, will be the principle beneficiaries of the alternative livelihoods promoted by the GNPS and NGOs. | • Opportunistic individuals would be prevented from accessing current and future alternatives developed for the fishing sector.<br>• Employment diversification of full-time and part-time active fishers would be promoted.<br>• Effective fishing effort on the sea cucumber and lobster fisheries would be reduced. |
| Fishing effort would be adjusted based on a defined number of users and criteria such as seniority and performance of active fishers, the exploitation status of each resource, and the labor requirements by type of fishery and fishing port. | • A portion of inactive licenses could be re-allocated to fishers currently working illegally in offshore fishing in Santa Cruz, while at the same time preventing access to the lobster and sea cucumber fisheries.<br>• Working conditions in the fishing sector (particularly divers and boat operators) would be more equitable, given that illegal fishers are generally paid less per fishing trip by the very fact of being illegal. |
| Gradual rather than sudden re-activation of inactive fishing capacity would avoid risking another economic collapse in the lobster and sea cucumber fisheries. | • Active fishers would have legal assurance that they would benefit exclusively from the application of particular management measures (e.g., total closure), which could mean resource recovery and improvement in the long-term profitability of fisheries. |

## Recommendations

Comprehensive reform of the PARMA licensing system would create the necessary legal conditions for the adoption of a new system of fishing rights and establish mechanisms that would help to align the economic incentives of fishers with resource conservation. Potential advantages and disadvantages of alternative fishing rights that have proven successful in eliminating the race for fish in other parts of the world and possible challenges for their implementation in Galapagos are presented below (Table 2).

**Table 2.** Alternative fishing rights for sea cucumber and spiny lobster fisheries in the GMR: advantages, disadvantages, and main challenges to their application in Galapagos (see Castrejón, 2011 & 2012).

| Type | Advantages | Disadvantages | Challenges |
|---|---|---|---|
| Individual transferable quotas | • Improves economic efficiency<br>• Reduces fishing capacity and effort<br>• Provides opportunity to plan fishing operations and investments<br>• Encourages the development of safer working conditions<br>• Improves product quality and price | • Tends to promote the establishment of monopolies<br>• May encourage underreporting of catch<br>• Tends to result in classification of the catch and discard | • Definition of initial allocation mechanism and collection of fees<br>• Implementation of cost-effective system for monitoring, control and surveillance<br>• Definition, validation and agreement on a method to estimate the total allowable catch per fishing season and allowable catch per fisher |
| Individual non-transferable quotas | • Avoids creating monopolies<br>• Promotes fairness and social cohesion | • May encourage underreporting of catch<br>• Tends to result in the classification of the catch and discard | |
| Territorial use rights for fishing (TURFs, concessions) | • Suitable for benthic resource management (e.g., sea cucumber and lobster)<br>• Provides legal certainty to fishers on the use of a specific area<br>• Generates the feeling of resource ownership<br>• Encourages strengthening fisheries organizations<br>• Tends to lower surveillance and information costs<br>• Encourages compliance with management measures | • Success strongly depends on social factors (e.g., organization, leadership, social cohesion)<br>• Open access areas may become scarce and overexploited<br>• Requires a robust surveillance system to prevent illegal fishing within DUTs | • Development and implementation of a strategy to improve the cohesion and organization of the fishing sector<br>• Design and adoption of a surveillance mechanism led by fishers (self-regulation)<br>• Assessment of the feasibility and effectiveness of the allocation of TURFs in Galapagos by a pilot project |
| Rotation of fishing grounds | • Areas are exploited according to their productivity and market demand<br>• Maximizes returns by sub-area while protecting sensitive areas that could provide sanctuaries for recruitment in order to generate the repopulation of adjacent areas<br>• Alternative for management based on total catch quotas | • Requires a solid understanding of the population dynamics of the resource and the behavior of economic variables such as market demand and price variability according to size<br>• Requires a robust surveillance system to prevent illegal fishing in unauthorized areas | • Definition of number and size of the sub-areas, as well as the optimal period of opening and closing them (rotation period)<br>• Continuous monitoring of fishing vessels to prevent illegal fishing during closed seasons |

For comprehensive reform of the PARMA licensing system we recommend:

1. Reaching consensus on and implementing changes through a participatory process supported by experts. For example, the Development Law Service of the United Nations Organization for Food and Agriculture (FAO) could provide advice for reforming the PARMA licensing system and implementing a new system of fishing rights (see http://www.fao.org/fileadmin/templates/legal/docs/DevLawService.pdf).

2. Reforming the conditions for the expiration of PARMA fishing licenses and vessel permits (Table 3).

3. Conducting a fishing survey to assess the current socioeconomic situation of active fishers in greater detail, as well as the physical condition of the fishing boats. This will allow the design and implementation of strategies for achieving the optimal size of the fishing sector.

4. Solve the problems described in a proactive rather than reactive manner, as established in the Fisheries Chapter of the GMR Management Plan.

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**Table 3.** Proposals to reform the PARMA licensing system of the GMR.

| Proposal | Justification / effect / observations |
|---|---|
| Reduce the period for which a person would lose his PARMA license/fishing permit due to inactivity in the sector from four to one year. | • Individuals with no interest in fishing would be removed from the fishing register.<br>• The fishing register would reflect the actual size and social structure of the Galapagos fishing sector.<br>• An extension of one or two years is recommended for license and permit holders who show that they have been inactive due to injury, illness, damage to their vessel or other major cause. |
| Require that a fisher must complete a minimum number of fishing trips per year to avoid losing their PARMA license/ fishing permit. | • The minimum number of fishing trips per year must be high enough to eliminate individuals/fishing boats not currently active from the register, but also must be low enough to avoid forcing active, occasional or part-time fishers to fish more days than normally.<br>• Thirty days per year is the recommended minimum number of fishing days to demonstrate that a person is still active, and thus prevent the loss of their PARMA license or fishing boat permit.<br>• Thirty days represents only 16% of the total duration of the spiny lobster and sea cucumber fishing seasons (six months or 180 days).<br>• The degree of activity of each fisher should be verified only through fishing certificates issued by the GNPS. |
| Establish a moratorium on new PARMA licenses/fishing permits as a precautionary measure (with no exceptions). | • The moratorium would last two years, during which time a fishing census, reform of the fishing regulations, and reallocation of the PARMA fishing licenses/ permits would be completed.<br>• During this period it is recommended that special fishing permits be granted to a group of new fishers who wish to devote themselves exclusively to the whitefish fishery or offshore fishing. This may help to temporarily relieve the labor shortage in these fisheries.<br>• At the end of the moratorium, the results should be reevaluated to then decide whether the moratorium should be extended or repealed. |
| Explicitly establish within the current legal framework that issuing fishing permits will be subject to the availability and exploitation status of each resource, with the GNPS as the institution responsible, under the terms established in the fishing regulation. | • We recommend a review of the Fisheries and Aquaculture Law in Chile (1991), which identifies specific management for each type of fishery according to its exploitation status (full exploitation, in recovery, or emerging development). |
| Continue annual monitoring of the number of registered and active fishers by port and type of fishery. | • This information should be used to annually evaluate the dynamics of the fishing sector, with emphasis on the age structure and the distribution of labor by type of fishery and fishing port. |

Photograph: Mauricio Castrejón

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