



Conservation could save commercial fishery in Argentina

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Short title: Better fishery management could significantly increase economic returns, Argentina.

Key Message: In Argentina, the implementation of conservation strategies is needed to avoid the collapse of commercial fish stocks and the fishing industry. Conservation strategies, including zoning and compliance with catch quotas, are expected to help recover hake stocks and increase the net benefit for the fishing industry.

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Reviewer: Marta Renzi, Juan Carlos Seijo

What is the problem?

The Argentine hake (*Merluccius hubbsi*) fishery is the key to the fishing industry in Argentina. The Patagonian Marine Ecosystem (Map 1) is one of the most productive ecosystems in the world and Argentine hake has ranked first in total catches for both volume and value during recent decades (Villasante and Sumaila, 2010). The Argentine hake fishery includes more than 50% of Argentinean fishing vessels and provides about 12,000 direct jobs (60% of total jobs in the fisheries sector). It has accounted for 40–50% of fisheries exports in recent years (Fundación Vida Silvestre, 2008).

Dramatic overexploitation, however, of the fish stocks has had disastrous consequences for the local fishing industry. Due to overfishing, the fish size is decreasing and discards (mainly small juvenile fish) represent between 11% and 24% of total landings between 1990 and 1997 (Dato et al. 2006). In economic terms, this represents an annual loss of US\$ 11–77 million (Villasante, pers. comm). The insufficient control and enforcement of fishing quotas and the liberalization and opening of the fishing grounds to foreign fleets (Godelman et al. 2000), largely through an access agreement between Argentina and the European Union (1993–1997), have contributed to this trend (Irusta et al. 2001).

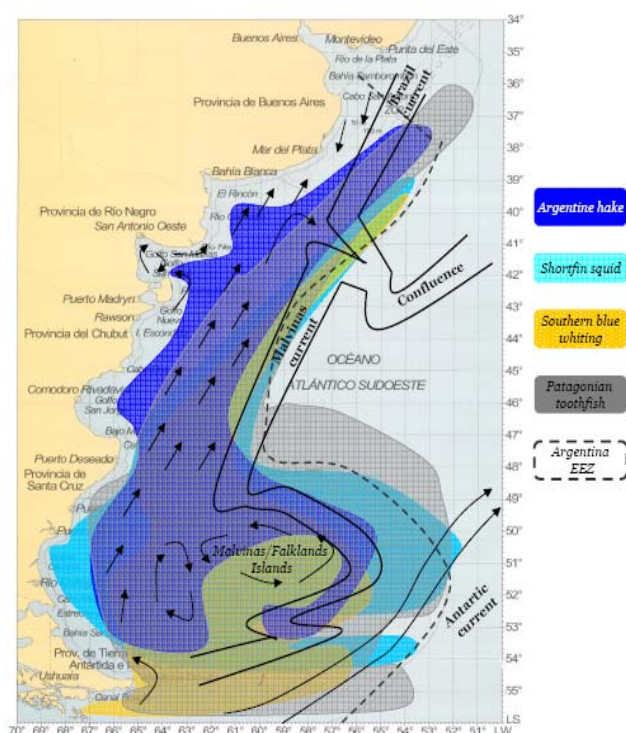
In response to the high percentage of juveniles in landings, a “no fishing zone” was created in 1997 to safeguard the nursery grounds around Isla Escondida. Bottom trawls are also forbidden inside the area. However, this has had little impact due to the lack of effective surveillance and control. The freezer fleet continued to concentrate around the limits of this zone and in 1999 the Federal Fisheries Council forced the freezer fleet to move to a zone of lower productivity (Hilborn et al. 2005).

Since 1999, the Federal Fisheries Council sets an annual total allowable catch (TAC). This takes into account a maximum sustainable yield (determined by scientists of INIDEP, the National Institute for Fisheries Research and Development). Lack of compliance, however,

and ineffective surveillance and control have led to the continued growth of overfishing, with recorded landings exceeding the TAC by 87% in 1999 and 93% in 2000. As a result, the continuing decline in total biomass of the fishery and a shift towards a dominance of smaller fish species has been observed (Villasante et al. 2009).

The increase of illegal, unreported and unregulated (IUU) catches, the lack of transparency of the fisheries management, and the insufficient implementation of conservation strategies to protect fish stocks have had negative biological and socioeconomic effects. Fishing licenses were given to trawlers in an unregulated manner. In 2002, the vessel monitoring system was interrupted due to government financial problems. Possibly due to corruption in the catch inspection system, misreporting of catches of hake occurred, undermining efforts to control quotas and evaluate the status of the fishery. Since 2003, the authorities have not been able to maintain the system of catch allocation by vessel. Consequently, the fishing fleet has been operating without restrictions (Godelman, 2004).

The continuing decline means that the fishery is at risk. It has reached the point at which it will be very difficult, if not impossible, to restore the fishery (both ecologically and economically) for present and future generations. In an attempt to reverse this pattern, the Federal Fisheries Council declared the fishery to be in a state of emergency.



Map 1: Pattern of the distribution of the main commercial fish stocks in the Patagonian Large Marine Ecosystem. Source: Villasante and Sumaila (2008).

What was done to solve the problem?

In the context of the current crisis, the central government must decide whether to continue with the short-term strategies used over the last 20 years or to develop new policies that are sustainable in the long term. To help with this decision, Villasante et al. (2009) used

ecological and economic modelling to explore the economic potential of responsible management of the Argentine hake fishery – management that recognizes ecological limits.

The analysis considered two scenarios, a proposed recovery scenario and a continuation of current practices, over a period of 20 years (from 2010 to 2030). The recovery scenario (Sustainable Ecosystem Management, based on an ecosystem model combined with economic valuation (Ecopath with Ecosim (EwE)) used an annual discount rate of 5%, assuming constant prices over time (Villasante et al. 2009).

The Sustainable Ecosystem Management scenario assumes that the existing quota (TAC) is respected (that compliance, surveillance and control is reasonably effective) and that the fishing capacity of the fresh fish fleet and the freezer fleet will be reduced by 25% and 50% respectively. Fleet reduction is expected to allow for a gradual increase in technological efficiency of 4.4% per year. The scenario also assumes a reduction in the discard rate of 8–20% between 2010 and 2015 and 3% between 2015 and 2030.

Ecological and economic analysis shows that the establishment of conservation zones, the enforcement of fishing quotas and a reduction in fishing efforts, will allow the recovery of fish stock to biologically acceptable levels. The Sustainable Ecosystem Scenario analysis indicates that despite a reduction in landings from pre-2010 levels, economic yields increase as stocks are allowed to recover and the number of discards is reduced.

The net present value (under the current overexploitation scenario) is US\$65 million for the fresh fish fleet and US\$263 million for the freezer fleet per year – while the Sustainable Ecosystem Management scenario projects a net present value for the fresh fish fleet increases of at least US\$118 million and US\$460 million per year for the freezer fleet (Villasante et al. 2009).

The results show that sustainable management that includes conservation zoning and compliance with quotas so that stocks can recover, can lead to a substantial increase in returns on investment. The recovery of the fish stock is likely to reduce the risk of a collapse of this economically important fishery and secure the economic sustainability of the region.

The difference in economic benefits in both scenarios covers only part of the total economic value of the fishery because other use and non-use values (such as commercial fishing of other species with trophic relationships with the Argentine hake, and other ecosystem services like tourism, regulation of the food web, ecological functions of fish habitats, and educational, research and aesthetic services, etc.) are not included.

What is the policy uptake?

This study has not yet attracted the attention of the Argentinean government. Efforts, however, have been undertaken by the government to regulate an individual transferable quota system.¹ The distribution of individual transferable quotas takes into account: a) the number of national employees on board, b) current foreign investment in the country, c) the average tonnage of reported catch landed or seafood products processed in the canning industry by vessels or groups of vessels d) and whether the party has violated fishing regulations in the past.

Despite these efforts, quotas still fail to meet the recovery goals because foreign fishing fleets remain unregulated. Introducing a quota that regulates all fishing activities, including foreign fleets, and the establishment of more no-take zones is necessary. Furthermore,

¹ recognized by article 27 of the Federal Fisheries Law No. 24922

compliance with the quota and no-take zones needs to be controlled and enforced effectively in order to achieve the both recovery and related economic benefits.

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