An Estimation of Compliance of the Fisheries of Argentina with Article 7 (Fisheries Management) of the UN Code of Conduct for Responsible Fishing

by

Daniela Kalikoski, Marcelo Vasconcellos and Tony J Pitcher

This evaluation of compliance with Article 7 (Fishery Management) of the UN Code of Conduct for Responsible Fishing (FAO 1995) is a 'living document' and may change with time. It is one of 53 such country evaluations covering the top 96% of the world fish catch. Using a wide range of cited source material, the document represents the best attempt by the authors at presenting a fair and objective evaluation of compliance using 44 questions derived from the Code. Questions are divided into six evaluation fields, (Management Objectives; Framework (data & procedures); Precautionary Approach; Stocks, Fleets and Gear; Social and Economic factors, and Monitoring, Control and Surveillance): the derivation of the 44 questions is described in Pitcher (1999). The first three fields cover intentions of a country's legislation to adhere to the Code; while the last three evaluation fields are intended to rate actual performance. Full details of the methods are published in Pitcher, Kalikoski and Pramod (2006). This evaluation has been subjected to several internal cross-checks and, where stated, has been validated by experts familiar with the country concerned. Uncertainty in assigning each score is shown explicitly. However, the authors are aware that omissions and errors of interpretation may still remain for some countries. An open protocol has therefore been adopted for all country compliance evaluations, and the team remains open at any time to comments, corrections or adjustments. Updated versions are made available online as necessary (ftp://ftp.fisheries.ubc.ca/CodeConduct).

FAO (1995) Code of Conduct for Responsible Fisheries. FAO, Rome, 41pp.

Pitcher, T.J. (1999) Rapfish, A Rapid Appraisal Technique For Fisheries, And Its Application To The Code Of Conduct For Responsible Fisheries. FAO Fisheries Circular No. 947: 47pp.

Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) (2006) Evaluations of Compliance with the UN Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2).

Copy edited by Janice Doyle

General

Validated by Guillermo Cañete, Lobo Orensanz and Ana Parma (Argentina).

20th rank in world catch 1999   1,012,804 t   (FAO)

In own EEZ   839,977   82.9% (SAU)   EEZ 1,164,622 km^2 = 0.7 t/km^2

In other's EEZs   0   0 % (SAU)

On High Seas   172,827   17.1 % (SAU)

Other countries estimated catch in Argentine EEZ 10,365 tonnes, 1% of domestic catch (SAU) mainly Uruguay.

Scored 2.5/10 (range 2.2–2.8), ranked 102/145, in the 2004 corruption perception index (Transparency International 2004).

Fishery management quality index is 5/6 (McWhinnie 2004).

Kelleher (2004): 15% overall; 24% discards for hake fishery, 50% in shrimp trawls, and 13% in coastal trawlers.

International Treaties score = 34% of max possible (based on SAU).

Argentina: Code Score Profile
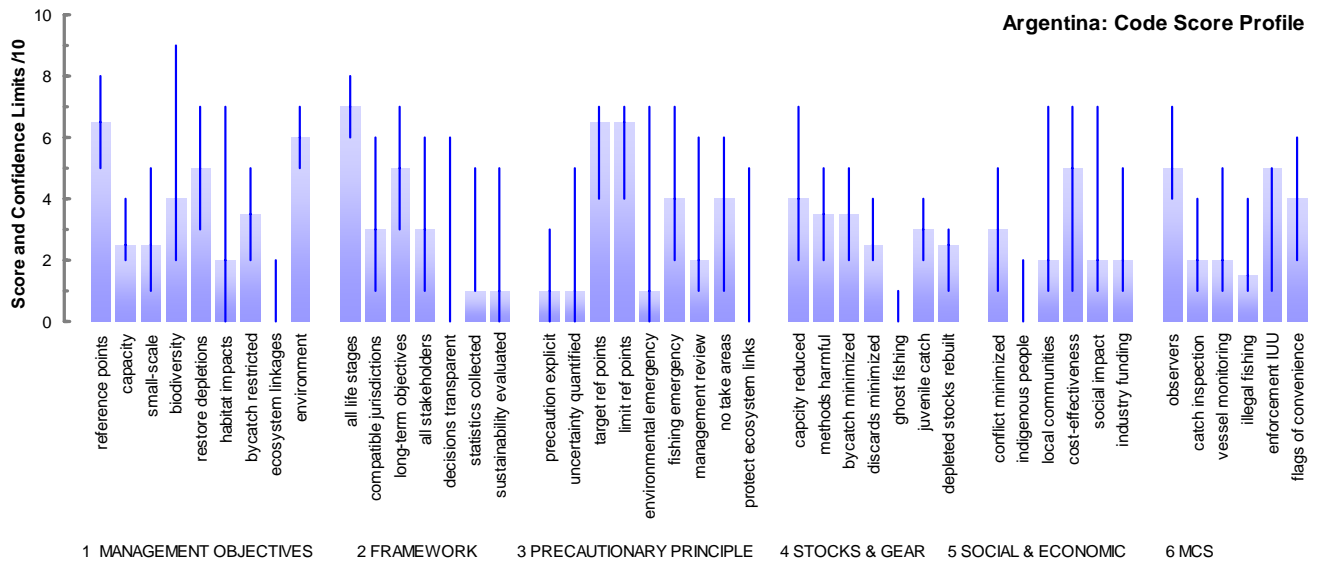
Note: Scores for Q6.4 and Q6.6 have been flipped in the above figure to show fisheries compliance

Field 1: Management Objectives

1. Are formal reference points for the fish stock in this fishery identified using best science available?

Score: 6.5
Score Range: 5 - 8

Reference points have been defined for main commercial fisheries such as hake, shortfin squid, "abadejo" and "langostino" (FAO, 2003). The management of shortfin squid uses a 40% escapement threshold to avoid high probabilities of low recruitment in the following season (Basson *et al.*, 1996). The process of closing the fishery when the threshold is reached is not immediate, taking from 2 to 3 weeks to be implemented. For this reason the real level of escapement is often between 35 and 20% of the stock (CEDEPESCA, 2003). In the case of the hake fishery, the stock assessment advice is based on a risk assessment that evaluates the consequences of management strategies to the recovery and maintenance of the spawning stock above defined targets: 400,000 tonnes and/or 500,000 tonnes (INIDEP, 2004). Whenever INIDEP has been given the possibility to opt among three possible scenarios of larger to smaller risk, the Fishing Federal Council and the application authority have opted for the riskiest scenario. But this year (2005) the political authorities chose an option that surpasses the greatest risk. The assessment scientists strongly recommend the use of the selective fishing gears and increasing no-take areas to protect juveniles. However, there is no clear evidence of acceptance of those recommendations (Cañete, pers. comm.).

2. Is present fleet capacity calculated and are there plans to reduce it?

Score: 2.5
Score Range: 2 - 4

An evaluation of fishing capacity of the hake fishery has been conducted and concluded that the fishery has an excess fleet capacity in the order of 120% (Godelman, 2004), although this value is disputed (Bertolotti *et al.*, 2001). The situation of the shortfin squid fishery is less clear. The fleet has increased in response to legislation that provides licenses for foreign vessels to operate in the squid fishery if they

land part of the catch in Argentina and if they employ Argentinean fishers (CEDEPESCA, 2003). That creates uncertainties with respect to the calculation of fishing capacity besides affecting the fisheries sustainability. According to the "Cámara de Poteros Argentinos" too many licenses have been approved so that there has been a saturation of the fishing grounds. As a result, for four consecutive years the closure of the fishing season has been anticipated and thus has adversely affected the national squid fishing industry (CEDEPESCA, 2003).

3. Are small scale fishers considered in plan?
Score: 2.5
Score Range: 1 - 5

There are no special national regulations for small-scale fisheries; the general regulations are applicable. Fishers need national licenses and have to be registered with the DNPyA (Dirección Nacional de Pesca y Acuicultura). Since they fish in areas of provincial jurisdiction, the operation is regulated by each province (FAO, 2003).

The most important fleet target is a multi-specific fishery called "coastal varied". INIDEP recommends identifying fishing units related to the spatial distribution patterns. These areas of ichthyologic coastal associations constitute a useful tool for the design of the fishery management plan (Carozza, 2005). In reponse to these recommendations, the CFP (Resolution 07/2005) established management and administration measures applied to the "coastal varied" group. The measures include the use of a vessel monitoring system and the use of observers on board whenever possible.

Part of the offshore fleet (targeted on hake) fish in the coastal zone in some areas and times. This is an additional impact on the resources, working in a competitive way with the small-scale fleet (Cañete, pers. comm.).

4. Impacts of fishery on biodiversity allowed for in plan?
Score: 4
Score Range: 2 - 9

Some of the impacts of fisheries on marine biodiversity have been identified and assessed, such as by-catch and incidental capture of marine fauna. Several species of small cetaceans, such as dusky *Lagenorhynchus obscurus,* Commerson's dolphin, *Cephalorhynchus commersonii,* and common dolphin, *Delphinus delphis,* are caught as bycatch in trawl fisheries in Patagonian waters, including those directed at hake, red shrimp and, more recently, anchovy (Dans *et al.*, 2003). The Franciscana dolphin (*Pontoporia blainvillei)* is also by-catch of a small-scale artisanal gillnet fleet that supports the livelihoods of a number of coastal communities. The bycatch rates are almost 800 individuals per year (Bordino *et al.* 2002).

According to FAO (2003), in response to International Plans of Action (IPOA) on sharks and seabirds, Argentina has initiated an evaluation of the status of shark populations and the incidental catch of seabirds, as well as the elaboration of management plans of action for mitigating these effects.

Regarding rays and sharks, uncertainty exists because of lack of information. Nevertheless, Argentina is one of ten countries that lands a lot of cartilaginous fish. Some species are completely discarded; therefore it is very necessary to get detailed information to know their status. Argentina signed FAO agreements to develop a Plan of Action for Sharks and Rays, but that assessment and long term strategy have not yet been implemented. Argentina has carried out an assessment of albatross and petrel bycatch

taken by the national long-line fleet, operating in the EEZ and in CCMLAR waters. The Argentine government signed an Agreement on Conservation of Albatrosses and Petrels (ACAP) document that, at present (2006), is waiting for legal ratification by the National Congress (Cañete, pers. comm.).

There is an investigative report concerning the interaction of marine turtles (lute turtle, *Dermochelys coriacea*, green turtle *Chelonia mydas*, stubborn Tortuga, *Caretta caretta*) with fisheries in the southwest Atlantic. The fisheries and institutions involved have been identified in order to gather information, but there are no policies or conservation measures in place at local or regional levels (Domingo *et al.*, 2005).

5. Does the management plan aim to restore depleted stocks in this fishery?
Score: 5
Score Range: 3 - 7

Management measures such as restricted access, closed areas and seasons and minimum sizes are applied to fisheries that approach biological reference points (FAO, 2003). An emergency plan has been in place since 1998 to stop the trend towards the collapse of the hake stock. Although some recovery was observed in 2000 and 2001, the plan was later undermined by different factors (see Q4.7). INIDEP (Inf. Nº 37/2005) set the objective to recover hake spawning biomass and recommended a TAC of 261,000 tonnes for the southern stock. Additional measures include the effective use of selectivity devices in target and non-target fisheries (e.g., bycatch in the shrimp fishery), and an increase in the permanently closed area for the protection of hake juveniles. Bottom trawls are forbidden inside the closed area. This is a controversial measure because shrimp vessels have been allowed to fish there since 2001. The authorities chose the more risky catch option with a spawning biomass recovery in just 25 years (Cañete, pers. comm.).

6. Are human impacts (pollution, waste) on the fishery habitat identified?
Score: 2
Score Range: 0 - 7
No information.

This region is under threat from a number of human activities including land based pollution and offshore oil and gas development, the growth of international and nature-based tourism and national mass tourism developments. These threats have been identified, but they have not yet been evaluated in a systematic way (Cañete, pers. comm.).

7. Is fishing gear mandated by the management plan to avoid by-catch of non-target species, environmental and habitat damage?
Score: 3.5
Score Range: 2-5

According to the Argentinean report to FAO (FAO, 2003), the use of selective fishing gears are mandated in some fisheries in order to limit incidental catch and discards of non-targeted species. Maximum trawling time and speed are regulated, fishing depth zones are delimited, observers are required on board, and monitoring and inspections are required. Specific mitigation measures have been applied to avoid the incidental catch of sea birds in longliners, including releasing lines at night, the use of tory lines, and avoiding the use of surface longlines. Selectivity devices designed by INIDEP were included in some regulations (Disela II in the shrimp fishery to allow hake to escape and Dejupa in hake bottom trawls). However, the industry rejected their use and therefore the existing regulations

are, in effect, not applied (Cañete, pers. comm.).

8. Are ecosystem linkages with this fishery made explicit in the management plan?
Score: 0
Score Range: 0-2

We could find no information on this question. Management measures are based on species rather than on the ecosystem. There appear to be no integrated management plans in Argentina.

9. Are environmental influences on this fishery made explicit in the management plan?
Score: 6
Score Range: 5 -7

The fishery for shortfin squid is one of the most affected by inter-annual variation in environmental conditions. The management of this fishery takes account of this variability. To cope with the year-to-year variation in biomass, the stock is monitored during the season and when the stock biomass approaches the escapement level, the fishery is closed (CEDEPESCA, 2003). Increased water temperature seems to have consequences in the development of the shortfin squid species, shortening their vital cycle and affecting their spatial distribution (Cañete, pers. comm.).

Shrimp specialists noted that recruitment success depends on the magnitude of the spawning biomass and on the environmental conditions of the place in which the first stages of the life cycle are developed. Therefore no management measure can guarantee shrimp abundance every fishing season because it is impossible to control environmental factors. However, sustainable management could attempt to minimize fishery impact on sock resilience. INIDEP has been monitoring benthic invertebrates on shrimp fishing grounds since changes in the catch composition could be used as indicators of trawl impact on the benthic ecosystem. Such indicators might show possible alterations of the shrimp habitat (Roux and Piñero, 2004).

Field 2: Framework (data & procedures)

1. Are total and complete removals from this stock over the whole stock area and over the whole life cycle accounted for in assessment?
Score: 7
Score Range: 6 - 8

In the stock assessment advice and in the recommendation of sustainable catches, hake discards are accounted for by indirect estimates (INIDEP, 2004; Godelman, 2004). No information is available for the other stocks. The problem of poor identification of species caught is not thought to be critical, as only 3.4% of the total Argentinean catch is not identified to the species level (Vasconcellos and Cochrane, in press). There are estimations of hake by-catch in the shrimp fishery and these are used to manage the fishery, especially inside the hake closed area. INIDEP scientists use catch records from all the fleets (national and international) inside and outside the EEZ. However, the authorities set the annual CMP (Maximum Allowable Catch) without accounting of catchs by foreign fleets (Cañete, pers. comm.).

2. Are management measures compatible with those of other jurisdictions concerned with this stock?

The Joint Technical Commission for the River Plate Maritime Front ("Comision Técnica Mixta del Frente Maritimo"), based in Montevideo, Uruguay, has been very active in promoting bilateral cooperation between neighbouring Argentina and Uruguay regarding the assessment and management of shared fish stocks, and in promoting scientific meetings and publications of regional and international relevance. Various stock assessment and fisheries management issues have been discussed (FAO, 1997). For various reasons, most of these activities have been suspended or reduced in recent years. The last decision adopted in relation to hake stocks was in 2000, and defined a total allowable catch of 100,000 tonnes divided as 55,000 to Argentina, 35,000 to Uruguay, and 10,000 tonnes as an administrative reserve (Godelman, 2004).

During the 1990s the Argentinean and British governments also created the South Atlantic Fisheries Commission (SAFC) to promote conservation and determine allocation quotas of straddling stocks of fish and squids. The SAFC is limited to quota recommendations for each country's jurisdiction, and has no means to regulate non-members fishing on the high seas (Barton *et al.*, 2002). There is, for instance, intense activity by foreign fishing vessels, mainly from Asian countries, fishing for the straddling stocks of squid just off the Argentinean EEZ. In the South West Atlantic Fisheries Commission (SWAFC), Argentina and the UK on behalf of the Falklands, discuss management of stocks that straddle the Argentine EEZ, the Falklands Exclusion Zone (FICZ) and the joint Argentine/UK management area (FOCZ).

The management of the fish resources in the region has been subject to various international and bilateral political complexities and sensitivities: a) the United Nations registered dispute over sovereignty of the Islas Malvinas/Falkland Islands between Argentina and the UK; b) there are areas of the continental platform that extend beyond the 200 miles of the Exclusive Economic Zone into the international high seas; c) fleets from Japan, China, Taiwan, Korea and Spain, fish in these waters and some of them also cross into the Exclusive Economic Zone to fish illegally. Talks in the SWAFC have currently (2005) broken down at an official level. The species involved in SWAFC discussions are squid (*Illex argentinus*), blue whiting (*Micromesistius australis*) and long-tail hake (*Macruronus magellanicus*).

Important species like Patagonian toothfish are not included in the joint management (which in fact, concerns only some agreements to exchange information). The fleets in Argentina EEZ and FICZ fish the same stock without coordinated management. With respect to governance of the High Seas, there is no multi-lateral Regional Fisheries Management Commission under the auspices of UNCLOS, as is found in some other regional seas. While the United Nations Fish Stocks Agreement could be applied, there is no formal management structure for its application (Cañete, pers. comm.).

3. Does the management plan have clearly stated long-term objectives?

According to the Argentinean Fisheries Law, the overall objectives of fisheries management are to maximize value from the fishery, and maximize the employment of Argentinean labor while providing incentives to the long term conservation of resources. Article 1 of the Argentinean Fisheries Law 24.922 states that, "Argentina will seek to develop fisheries to a maximum potential compatible with the rational utilization of living marine resources. It will promote the effective protection of the

national interests related to the fisheries and the sustainability of the fisheries activities, incentivizing the long term conservation of resources, favoring the development of industrial processes environmentally appropriate that allow obtaining the maximum aggregate value and maximize the employment of Argentinean labor".

Although the law is clear, the real day-by-day management is more focused on short term crises to balance conflicts of interest between different sectors. There is a lack of long term policies, a lack of enough expertise on management issues and a strong influence of politics or economics over technical decisions. There is no clear legal framework, with frequent contradictions between regulations from different jurisdictions (National, Provincial).

4. Are all the stakeholders in this fishery resource identified and considered?
Score: 3
Score Range: 1 - 6

Godelman (2004) asserts that the suspension of Resolution 73/2004 (which tried to establish an emergency plan for the hake fishery) had the virtue of triggering political discussion about the implementation of the Federal Fisheries Code. Discussion tables were established by the national authorities to receive criticisms and proposals from the different sectors and provinces and so this may be considered as a case of identification and consultation with interested parties in fisheries management. The stakeholders in these fisheries are identified, but there are no clear and transparent systems of participative management to empower all sectors of the fishing industry in policy formation and management decisions (Cañete, pers. comm.).

5. Is data management process and decision-making open and transparent, including any international aspects?
Score: 0
Score Range: 0 - 6

There are strong doubts about transparency and openness of data management process and of decision making in Argentinean fisheries. Corruption is an issue present at different levels of the fishery management process. Decisions depend more on sectoral lobby capacity or political influence than a real participatory process (Cañete, pers. comm.). Godelman (2004) cites occurrences in the hake fishery during the 1990s that indicate a lack of transparency in fisheries management. These include lack of control and the indiscriminate and unjustifiable issuing of fishing licenses (which according to the author led to a situation of near collapse of the fishery), and the control of information about the status of the fishery by the state.

6. Are timely, complete and reliable statistics collected and verified?
Score: 1
Score Range: 1 - 5

Recent problems with the catch inspection scheme, vessel monitoring systems and observer programme have reduced the capacity to collect reliable statistics (see Q4.7). There is a high level of uncertainty in the fishery statistic because of poor quality information tools (e.g., no set-by-set logbooks), lack of controls, corruption, lack of integration and cross controls between different sources, lack of enough funds and political will to implement an integrated fishery monitoring system according to international standards (Cañete, pers. comm.).

7. Are social, economic and institutional factors related to sustainability evaluated with data?
Score: 1
Score Range: 0 - 5

The importance of socio-economic information to achieving conservation goals is recognized but not sufficiently developed. There is a lack of complete information identifying the complex economic and social relationships between industry and communities and this affects the possibility to work with economic incentives to diminish excess capacity, to promote responsible fishing, to generate market incentives or to encourage regional developments (Cañete, pers. comm.).

Field 3: Precautionary Approach

1. Is precaution explicitly enshrined in legislation, and is it applied to management of these fisheries?
Score: 0
Score Range: 0 - 2

Filippo (2005) analyzed the legal framework of Argentinean fisheries related to the recommendations of the FAO Code of Conduct. He concluded that there are a lot of fishery regulations: different laws, decrees, and regulations from different jurisdictions - national, provincial, parliament, and fishery authorities. However, there are a scarcely any instances of management plans (Article 7.3 in the FAO Code); guidelines for data recording for fishery management (Article 7.4); precautionary approach (Article 7.5); inclusion of international guidelines and standards for monitoring (Article 8.1); and fishing gear selectivity (Article 8.5). The poor inclusion of FAO recommendations in fishery legislation and management makes the evaluation of the actual implementation, fulfillment, and effectiveness of the regulations difficult. Filippo (2005) concludes, based on interviews with stakeholders, that there is a lack of confidence in the legal framework's efficiency because of the poor status of the resources and the lack of effective management (Cañete, pers. comm.).

In face of the apparent failure of the shortfin squid fishery in the beginning of 2004, the National Fisheries Council (Consejo Federal Pesquero) has been criticized for not following a precautionary approach to the management of the fishery (CEDEPESCA, 2004). "Considering the successive reductions in [squid] catches during the last years, it is apparently precautionary to increase the number of licensed boats from 60 to 100, 30 of them being foreign boats chartered for three years. The experience seemed to indicate that it would be more appropriate for the sustainable management of the resource, and with the law, to adopt 60 vessels as the baseline and to establish annual agreements with the foreign fleet in cases when there was evidence of surplus production … despite complaints of entities such as the "Cámara de Armadores Poteros (CAPA) … The Fisheries sub-secretary took almost a year to call for a workshop to analyze and solve the delicate situation that had been perceived by the sector. But the lack of a precautionary criterion – maybe a constant in this administration – led the Sub-secretary to anticipate the opening of the fishing zone to the north of 44°S without proper information, thus exposing the fishery to a new failure" (CEDEPESCA, 2004).

2. Is uncertainty, including lack of appropriate information, quantified and used to restrain fishing that might otherwise occur?
Score: 1
Score Range: 0 -5

In the case of hake fishery, uncertainties are incorporated in the stock assessment to advise on the level of risk of total allowable catch in respect to the maintenance of the spawning stock above certain recommended levels (INIDEP, 2004). The same type of approach has been applied to the assessment of other fisheries. However problems in the implementation of harvest control can undermine the capacity to restrain fishing, such as described by CEDEPESCA (2004) for the case of the short-fin squid fishery. "During the last years there has been one problem after the other precluding the execution of fisheries research cruises on the time and form [necessary for the assessments]; observers were not recruited in adequate time and numbers to inform scientists of INIDEP (the National Institute of Fisheries Development); as a result the system of "early warning" was transformed into a system of "late warning", and the level of escapement did not reach the recommended level of 40% of the stock." (CEDEPESCA, 2004).
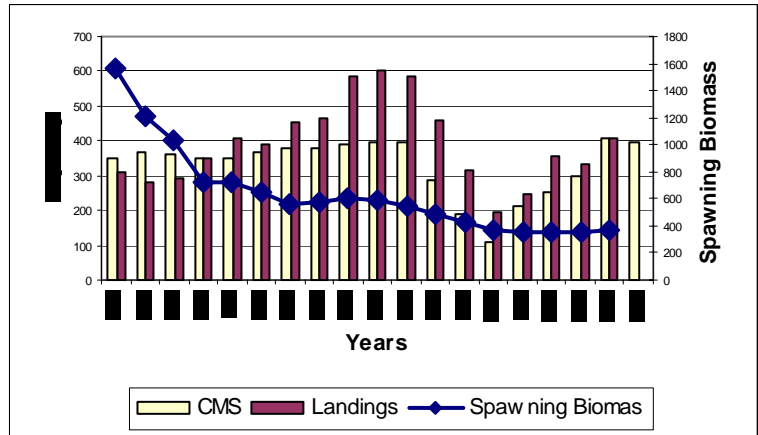
In addition, although INIDEP scientists try to incorporate uncertainty in the stock assessment in advising on the level of risk of different catch options, usually the authorities choose the high risk option without taking notice of uncertainty and other factors. Fishery management using catch limits (TAC or CMS + quotas) is undermined by a tendency to allow the fishery to exceed the "legal" landings (see figure above for hake; CMS, light bars = quota; dark bars = reported landings; line and points = estimated biomass). There are differences in reporting "legal" catches versus actual catch and landings due to discards, misreporting, conversion factors on factory trawlers, lack of controls and corruption (Cañete, pers. comm.).

3. Are stock-specific target reference points estimated and employed?
Score: 5
Score Range: 4 - 6

As highlighted in Q1.1, and by FAO (2003), target reference points are defined for hake, squids, abadejo and langostino. A recovery target has been defined for the hake stock in the stock assessment advice. Based in part on these reference points, the Consejo Federal Pesquero annually establishes the maximum allowed catches for these stocks. However, as noted in Q1.1, the recommendations are often not followed.

4. Are stock-specific limit reference points estimated and employed?
Score: 3.5
Score Range: 2 - 5

Yes; limit reference points are reported to be estimated for most assessed stocks in Argentina. However, implementation of recovery plans using these limits has hardly been undertaken.

5. Are there viable contingency plans to restrict fishing in the event of an environmental emergency?
Score: 1
Score Range: 0 - 7

In the case of the fishery for short-fin squid there is an in-season monitoring of the fisheries with the underlying goal of allowing a percentage of the stock to escape from exploitation. This in-season monitoring can be considered a mechanism in place to account for emergency situations caused by environmental and excess fishing. For instance, in the region south of 44°S the 2002 and 2003 seasons were closed earlier in order to protect the resource. The system, however, cannot be considered to have rapid-acting triggers. The process of closing the season is slow, taking between 2 and 3 weeks; during this time fishing is very intensive so that the real escapement ends up being much smaller than desirable (CEDEPESCA, 2003). In general there are no viable contingency plans to restrict fishing in the event of an environmental emergency. The system described above was designed to manage the fishery regarding allowable catches and the escapement of enough spawners to ensure the next year's recruitment. There is no environmental monitoring system, nor indicators that could trigger some response to restrict fishing. In fact, fishing is always forced to the limits (and beyond it) due to socio-economic factors (Cañete, pers. comm.).

6. Are there viable contingency plans to restrict fishing in the event of an unforeseen emergency caused by excess fishing?
Score: 4
Score Range: 2 - 7

See Q4.5 above. There are no viable and explicit contingency plans to restrict fishing in the event of an unforeseen emergency caused by excess fishing. There is no fishery monitoring system, nor any indicators that could trigger some response to restrict fishing. In fact, fishing is always forced to the limits (and beyond it) due to socio-economic factors. There are only some committees who analyze the in-season management of some fisheries like shrimp and Patagonian tooth fish. In the first case, the committee observes the interaction between shrimp and hake, especially inside the hake closed area. The hake assessment group establishes the by-catch limit. The committee makes recommendations regarding the openness or close of the shrimp fishery inside that area (Cañete, pers. comm.).

7. Are management instruments under continuous review?
Score: 2
Score Range: 1 - 6

There are examples of reviews occurring during situations of crisis. For instance, since the near collapse of the hake fishery in the late 1990s management instruments have been adjusted by different resolutions and decrees. However the management instruments are not systematically reviewed under an adaptive management scheme. There are no long-term management plans, management procedures, indicators, monitoring or evaluation systems. Changes in management measures are motivated by urgent crises, industry complaints, technical proposals or politics (Cañete, pers. comm.).

8. Are no-take areas of sufficient size to work, established, policed and monitored as an insurance?
Score: 4
Score Range: 1 - 6

Based on the UNEP-WCMC (2002) database, the total area of no-take zones (coastal protected areas under categories I and II of IUCN) in the Patagonian Shelf LME is about 852 km^{2}. That represents less than 1% of the EEZ, considering the large overlap between the LME and the Argentinean EEZ. There are 39 coastal-marine protected areas in Argentina. However, all of them are "paper parks" without effective management.

The closed marine area is very small, and for this reason it has no effect on fishery management. On the other hand, there are a few closed areas (no-take zones) designed to protect; (i) hake spawners and juveniles, (ii) shrimp juveniles, (iii) multi-specific coastal assemblage reproductive areas, and (iv) juveniles of Patagonian tooth fish and, to some extent there are closed times (areas) to protect squid. Some of these areas are permanent, some of them open and close seasonally. The effectiveness of the fisheries closed areas is variable. As an example, the permanent closed area for hake juveniles is one of the largest in the Argentinean EEZ. Although bottom trawling is forbidden, there is an anomaly because shrimp vessels are allowed to fish there from July to November (2001-2004).

9. Are plans in place to restrict fishing if species linked through the ecosystem to the target(s) of this fishery become threatened?
Score: 0
Score Range: 0 - 5

Fisheries regulations and management do not take into account a precautionary (including recognizing the food requirements of other wildlife), multidisciplinary and ecosystem approach (including regulations for the by-catch of non-target species) (Cañete, pers. comm.).

Field 4: Stocks, fleets and gear

1. Is excess fleet capacity being reduced?
Score: 4
Score Range: 2 - 7

According to the Argentinean report to FAO (2003), some actions have been taken to reduce fishing capacity. They include a moratorium on vessel registration and on increasing fishing effort from vessel replacement. In spite of this, there is no concrete policy to reduce the actual fishing capacity that threatens marine ecosystems. The expected but delayed ITQ system could play a role in reducing capacity (loss of profitability), but in a negative way because of the lack of active policies and appropriate alternatives.

2. Are fishing methods known to be harmful to habitats, to create by-catch problems, or whose high fishing capacity is difficult to control, being phased out?
Score: 2
Score Range: 1 - 4

Argentina has prohibited the use of driftnet fishing in its territorial waters and EEZ, and also bans the use of driftnet fishing by national vessels on the high seas (Rothwell, 2001). Other gear types suggested by this question are uncertain. In particular, there is no evidence of any effort to phase out bottom trawling or any other type of trawling in Argentina (Porter, Pers. Comm.).

3. Is by-catch of non-target species minimized?
Score: 3.5
Score Range: 2 - 5

According to the Argentinean report to FAO (2003), in order to limit incidental catch and discards,

selective fishing gears are mandated in some fisheries, maximum trawling time and speed are defined, depth zones are delimited for fishing, observers are required on board, and monitoring or inspection is required. Specific mitigation measures have been applied to avoid the incidental catch of sea birds in longliners, including releasing lines at night, the use of tory lines, and avoiding the use of surface longlines. Moreover, the National Institute for Fisheries Development (INIDEP) is carrying out research projects on fishing gear selectivity and fishing technology development to improve species and size selection in trawl fisheries, especially for shrimp (*Pleoticus muelleri*) and hake (Prado and Drew, 1999). Research is also focused on the optimal utilization of unavoidable incidental catch, such as the elaboration of high value by-products.

The selectivity devices designed by INIDEP to allow hake to escape shrimp trawls (Disela II) and for hake bottom trawls (Dejupa) have been included in some regulations. However, the fishing industry has rejected their use. Therefore the existing regulations are not applied. Unfortunately, economic and political conditions make the implementation of such devices difficult. In recent years, the hake fishery is mostly based on age 2 (pre-recruits). There are more of 40% juveniles in southern hake stock catches, and more than 70 % in northern stock ones. A market and demand has developed for juvenile hake. This means that industry includes juveniles in their business and probably, they will reject any measures that could affect it. A strong political decision and a well based management plan are needed to address this issue (Cañete, pers. comm.).

4. Are discards minimized?
Score: 2.5
Score Range: 2 - 4

Article 21 of the Argentinean Fisheries Code (Ley de Pesca) forbids discard on the basis that it is against responsible fisheries practices (Godelman, 2004). However, discards are a serious problem especially in the fisheries for hake and "langostino" (shrimp) and it is estimated that since 2000 between 24,000 and 70,000 tonnes of fish have been discarded annually by these fisheries (INIDEP, 2004). Other fisheries with high discard rates are the shrimp beam trawl fishery (50%, plus substantial quantities of juvenile hake), the Patagonian scallop dredge fishery and other clam fisheries. On the other hand the squid fishery (jig and trawl) and the pelagic fisheries for southern blue whiting have low discard rates. The minimization of discards requires technologies that reduce by catch, and economic measures such as catch quota incentives that increase the value of the quota. However discards are still considerable. Kelleher (2005) gives an estimate of 15% of total Argentinean catches as discards, but given the information below, this seems rather low.

During the 1990's, the hake trawl fisheries discarded almost 150,000 tonnes (Kelleher, 2005). Hake discards depend on many factors like population structure and small fish availability, fleet distribution patterns, fishing gear technology, target species abundance and market demands/alternatives, fishers' behavior and decisions. The hake discard rate has dropped dramatically since 1998 mainly because of the large closed area designed to protected juveniles. Lower TACs and some controls have also helped to diminish discards. Use of BRDs has also reduced the amount of juveniles caught as by-catch and discards (Kelleher, 2005); indeed, these selectivity devices are mandatory to juvenile catching juveniles, but it appears that this is not well enforced. INIDEP reported 3 strong year classes that produce high recruitment; the fishery is currently supported by these recruitments, but with a high percentage of juveniles in the catches that will not allow the stock age structure to recover. Discards were very high in the past, but nowadays industry uses the small fish previously discarded because of the lack of larger, older fish. Currently the discard rates have dropped, but there are high fishing mortalities for pre-recruit ages. The management plan needs to guarantee the survival of more juveniles

to allow spawning biomass to recover, but unfortunately, juvenile hake are now part of the business (Cañete, pers. comm.).

5. Is gear designed to minimize ghost fishing if lost?
Score: 0
Score Range: 0-1

No information is available about ghost fishing in Argentina, suggesting that this issue mentioned in the Code of Conduct is likely not recognized by this country.

6. Is the fishing of juveniles and spawners restricted to safe levels?
Score: 2
Score Range: 1 - 3

In the case of the short-fin squid, management measures to protect juveniles and spawners include closed areas and seasons, and a minimum escapement biomass of spawners to guarantee that enough individuals reproduce.

In response to a situation of overfishing and near collapse of the hake fishery, a closed area off the coast of Chubut to was established in 1998 protect juvenile hake (Godelman, 2004). Because of lack of effective means of control (interruption of vessel monitoring system) this measure was not satisfactory. For instance in 2002 and 2003 (when VMS was not operational) more than 70% of the fishing mortality was directed to younger individuals (age 2), compared to levels between 15 and 40% in previous years (INIDEP, 2004). (See Q1.5. and Q4.4).

7. Are depleted stocks being rebuilt?
Score: 1
Score Range: 0 - 3

In response to a situation of overfishing and near collapse of the hake fishery a series of measures were established and implemented (Godelman, 2004). In 1998 a closed area off the coast of Chubut was established to project juvenile hake. In 1999 the fishery was placed in an emergency status by the National Congress leading to the prohibition of fishing by freezer trawlers which were restricted to low density areas south of 48°S, and the system of quotas was temporarily suspended. These measures were to be valid until biological information proved that such strict measures were not any longer necessary (Cordo 2004, 2005).

In 2000 a vessel monitoring system was put in place to control fishing access to the closed areas and the system of observers on board was intensified. Since 2001 these emergency measures were formalized in a specific norm that kept freezer trawlers out of the hake fishery and established catch limits per boat. As a result, in 2000 and 2001 the stock showed weak signs of recovery.

However a conjunction of factors undermined the sustained recovery of the stock: (a) between 14 and 23 freezer trawlers obtained licenses to fish without being challenged by the state; b) in 2002 the vessel monitoring system by satellite was interrupted because the service was not being paid (it became operational again in 2004; c) the system of observers on board was interrupted because of lack of resources; d) suspected corruption in the catch inspection scheme, reinitiated in 2000, led to misreporting of hake and other resources and undermined efforts to control quotas and assess the status of the stock; e) since 2003 the authorities have not been able to maintain the system of catch allocation

by vessel and the fleet has operated unrestricted; f) during all this period fishing effort has continuously increased through the transfer of licenses (Godelman, 2004).

In January 2004 a very controversial law was approved (Resolution 73/2004) which opened access again to fishing by freezer trawlers north of 48˚S. This was later rescinded and other rectifying measures are currently in negotiation. The INIDEP Hake Southern Stock Assessment (2005) reported that "there are no clear signs of recovery, 3 strong consecutive year classes could not benefit the population with a significant increase of the spawning biomass". The main reason is "high fishing mortality rates on year classes 1 and 2 because of overcapacity and the lack of selectivity of the fishing gears used by the fleets in the area. The fishery is under risk of collapse because it depends on successful recruitment" (Cañete, pers. comm.).

Field 5: Social & Economic

1. Is the fishery managed so as to minimize conflict among different sectors?
Score: 3
Score Range: 1 - 5

According to the Argentinean report to FAO (2003) there are conflicts between coastal and industrial fisheries and between different types of fishing gear and many conflict resolution mechanisms are mentioned in this document. However, the reality appears somewhat different to those engaged in the fisheries.

The hake fishery suffers a high level of conflict among different sectors (industry sectors like factory trawlers versus shore-side delivery fleets; provinces versus nation, etc.). The stakeholders in these fisheries are identified, but there are no clear and transparent systems of participative management to empower all sectors of the fishing industry in policy forming and management decisions. There is no proactive policy to solve the overcapacity problem. The Government has been working to implement the ITQ system but there are problems with the first quota allocation.

The shrimp fishery shows other conflict scenarios due to a large by-catch of hake. There are intentions to set something like a hake by-catch limit to manage the shrimp fishery, especially inside the hake closed areas. Political lobbying makes it difficult to achieve responsible decisions based on consensus.

There are no clear and transparent conflict resolution mechanisms to solve conflicts between coastal and industrial fleets. All the fleets want more resources to fish. The coastal industrial fleet has requested their own fishing zone, limited by 50 m deep isobaths. The government agreed with that, but there are enforcement problems. The coastal industrial fleets compete with the small-scale and artisanal fleet and the latter also request their own exclusive fishing grounds (at least 3 miles out from the shore). There are no clear rules for all of them and no effective management plans to deal with that competitive schemes.

2. Are Indigenous Peoples rights and needs being met?
Score: 0
Score Range: 0 - 2

Mapuche and other indigenous coastal groups and communities in the south of Chile are not formally recognized in Chile and, despite the fact that many Mapuche communities are involved as crew and

workers in the hake fishery south of Concepcion, there are no native groups with special fishing rights related with maritime fisheries (Cañete, pers. comm.).

3. Are the needs of local fishing communities being met?
Score: 2
Score Range: 1 - 7

There is no clear and transparent participative mechanism where the artisanal and small-scale fishermen and coastal communities can defend their rights. The Federal Fishery Council is mostly concerned with industrial fleets (Cañete, pers. comm.).

4. When a change to the management of a fishery is made, is its cost-effectiveness evaluated?
Score: 5
Score Range: 1 - 7

The facts show that there is lack of consideration for cost-effectiveness, alternatives, etc. There is no clear understanding about the ITQ system's requirements and consequences. If market forces alone were to be allowed to manage the overcapacity issue under an ITQ context, there would be a lot of problems for small companies and their employees. The management system should understand the impact of its management decisions in the social and economic factors that affect the most of those involved in the fishery and to act to reduce the main impacts over the communities (Cañete, pers. comm.).

5. When a change to the management of a fishery is made, is its social impact evaluated?
Score: 2
Score Range: 1 - 7

There were union's workers strikes in two of the main fishing cities (Mar del Plata and Puerto Madryn) in 2005, in a claim for better incomes. Bad seasons for shrimp and squid (and low hake quotas) have negative economic impacts in Patagonia, for instance. Because of that there is an increased social tension. There are no explicit policies for different catch alternatives, for example how to deal with a 30% hake TAC reduction. These are issues that should be taken into account in a long-term management plan (Cañete, pers. comm.).

6. Is funding for the research and the MCS programme obtained by cost recovery from the industry?
Score: 2
Score Range: 1 - 5

There have been attempts to transfer the costs of the observer program in the squid fishery to the industry (CEDEPESCA, 2003). But overall, there is no effective cost-recovery system to fund research, monitoring, control and surveillance. Industries pay a fee (a rate over production), and pay for observers and inspectors (at least the day costs at sea). This problem undermines the effectiveness of the management system (Cañete, pers. comm.).

Field 6: Monitoring, Control & Surveillance (MCS)

1. On a ten point scale, how effective is the observer scheme?

Score: 5
Score Range: 4 - 7

There are observer programs in place for short-fin squid and hake fisheries, but these have been covering only part of the fleet. In the squid fishery the coverage in 2000 was considered sufficient, in 2001 only one or two foreign boats had observers on board, and there were none in 2002. In 2003 a resolution of the Federal Fisheries Council mandated the permanent use of observers in 5 'poteros' to be elected by INIDEP (CEDEPESCA, 2003).

The need for a continuous and reliable program of observers on board of hake fishing fleet has been recognized (INIDEP, 2004). Recently, as a result of the Resolution N° 74/2004, approximately 10 trawlers have been monitored through observers from INIDEP. This needs to be expanded to the entire fleet. The INIDEP Observer Program has the experience, expertise and a trained group of observers to do an effective job. However, the lack of core funds produces large fluctuations in the deployment of observer that limits the possibility to get enough information for scientific and management needs. On the other hand, the legal framework establishes that vessels receiving an observer have to pay the sea day costs under a set of special conditions, for example, prospecting inside the closed area. This particular way of working limits INIDEP's capacity to deploy observers using a sampling scheme, so there is a biased view of the fishery activity (Cañete, pers. comm.).

2. On a ten point scale, how effective is the catch inspection scheme?
Score: 2
Score Range: 1 -4

The catch inspection scheme is not effective because of information gaps, incomplete data from observers (lack of financing), and lack of control of fisheries landings (FAO, 2003).. The onboard inspection scheme fails because it is ineffective by definition (one inspector on each vessel during the entire fishing trip). The observers are not included in the inspection scheme. Inspectors might be better placed onboard patrol vessels so that they can check different fishing vessels. Another important issue regarding the catch inspector's efficiency is a lack of background (education, training), the presence of a weak legal framework, failure of the institutional structure to prosecute transgressors and, of course, corruption (Cañete, pers. comm.).

3. On a ten point scale, how effective is the vessel monitoring scheme?
Score: 2
Score Range: 1 - 5

The VMS does not match totally international standards. It is an open system instead of a "black box" system. Although there is a system of vessel monitoring by satellite for vessels larger than 25 meters (FAO 2003), the scheme does not include vessels below 25 meters long in a cost-effective way (Cañete, pers. comm.).

4. Are vessels fishing illegally in the area of these fisheries?
Score: 8.5
Score Range: 6-9 (Note: high scores express much illegal fishing).

Illegal fishing is identified as a serious problem for the country (FAO, 2003), especially in Patagonia (Anon, pers. comm.). Illegal fishing occurs not only for species that are fully exploited, such as hake and toothfish, but also for squids. According to the information reported in CEDEPESCA (2003)

during the last 3 years there was an increase of almost 50% in the occurrence of foreign fishing vessels inside the 200 mile EEZ. According to the same source, during 17 patrol surveys carried in a month, a total of 225 foreign vessels were found operating illegally, the majority from China, Taiwan and Korea. The complex political situation presents a particular challenge for sustainable development. There are areas in dispute with the United Kingdom in relation to sovereignty over the Falkland Islands, and there are areas of the continental shelf that extend beyond the 200 miles of the EEZ into international high seas. Foreign fleets fishing in these waters include Japan, China, Taiwan, Korea and Spain (Cañete, pers. comm.) and incursions into the Argentinean EEZ are routine.

5. On a ten point scale, how effective is control of access in stopping illegal fishing?
Score: 5
Score Range: 1 - 5

According to the Argentinean report to FAO (2003), measures have been taken to control IUU fishing, and a more specific plan was expected to be ready by 2004. The Argentinean legislation contemplates almost all aspects required to elaborate a plan and it establishes all the obligations that any vessel fishing in areas adjacent to the Argentinean EEZ must follow. Navy patrols attempt to control the intrusion of foreign flagged vessels without permission to enter the Argentinean EEZ, and some foreign vessels have even been sunk (New York Times (1994).

6. Are vessels that really derive from this jurisdiction reflagged in states of convenience, generally to avoid reporting or other fishery regulations?
Score: 6
Score Range: 4 - 8 (Note: high scores express much FOC activity).

According to the Argentinean report to FAO (2003), national vessels operating in international waters or in other countries EEZs must have a license issued by the government and must follow the conservation norms applicable to the area where they operate. Starting in 2003 the country will provide FAO with a list of all national vessels authorized to fish in the high seas. However, a number of Argentinean-owned toothfish vessels have been known to be re-flagged when operating illegally (Isofish, Tasmania) and Argentinean companies have been implicated in illegal trans-shipment (Gianni *et al.*, 2005).

References

Barton, D., Agnew D. and Purchase, L. (2002) The Southwest Atlantic: achievements of bilateral management and the case for multilateral arrangement. CEFAS Fisheries Symposium, 2002.

Basson, M., Beddington, J.R., Crombie, J.A., Holden, S.J., Purchase, L.V. and. Tingley, G.A (1996) Assessment and management techniques for migratory annual squid stocks: the *Illex argentinus* fishery in the Southwest Atlantic as an example. *Fisheries Research* 28: 3-27.

Bertolotti, M.I., Verazay, G. and Akselman, R. (eds) (2001) El Mar Argentino y sus recursos pesqueros. Tomo 3. Evolución de la flota pesquera argentina, artes de pesca y dispositivos de selectividad. Publicaciones especiales INIDEP, Mar del Plata, 165 pp.

Zapata, F., Fazio, A., Aspalanato, N., Bernisone, L., Caride, A., Echezarreta, A., Faura, Gonzalez, V. and Oberti, A. (2005)

Bordino, P., S. Kraus, D. Albareda, A. Fazio, A. Palmerio, M. Mendez and S. Bottac (2002) Reducing Incidental Mortality Of Franciscana Dolphin *Pontoporia blainvillei* With Acoustic Warning Devices Attached To Fishing Nets. *Marine Mammal Science* 18(4): 833–842.

Carozza, C., Fernandez Araoz, N. and Lagos, N. (2005) Asociación íctica costera bonaerense "variado costero" evolución de las capturas desembarcadas por la flota comercial argentina (1990-2003). Informe Tecnico Interno INIDEP Nº 04, 21pp.

CEDEPESCA (2003) La pesqueria de calamar en Argentina. Comunidad Pesquera no 9, July 2003, (http://www.cedepesca.org.ar)

CEDEPESCA (2004) El fracaso total de la zafra 2004 obliga a repensar todo. (http://www.cedepesca.org.ar)

Cordo, H. (2004) Evaluación del estado del efectivo norte de 41ºS de la merluza (*Merluccius hubbsi*) y estimación de la captura biológicamente aceptable correspondiente al año 2004. Informe Tecnico Interno INIDEP Nº 17, 35pp.

Cordo, H. (2005) Evaluación del estado del efectivo sur de 41ºS de la merluza (*Merluccius hubbsi*) y estimación de la captura biológicamente aceptable correspondiente al año 2005. Informe Tecnico Interno INIDEP Nº 48, 27pp.INIDEP Nº 37, 29pp.

Dans, S., Koen-Alonso, M., Pedraza, S.N. and Crespo, E.A. (2003) Incidental catch of dolphins in trawling fisheries off Patagonia, Argentina: can populations persist? *Ecological Applications* 13(3): 754-762.

Domingo, A., Bugoni, L. and Prosdocimi, L. (2005) Diagnóstico de Situación: Las Tortugas Marinas y su Interacción con las Pesquerías en el Océano Atlántico Sur Occidental (ASO), 22 pp.

FAO (1997) Review of the state of world fishery resources: Marine Fisheries. FAO Fisheries Circular 920.

FAO (2003) Summarized extracts on the status of implementation of the Code of Conduct for Responsible Fisheries. 25th Session, 24 – 28 February 2003.

Filippo, P. (2005) Análisis de la legislacion argentina en materia de ordenamiento y operaciones pesqueras a la luz del Código de Conducta para la Pesca Responsable de la Organizacion de las Naciones Unidas para la Agricultura y la Alimentación FAO. Fundación Vida Silvestre Argentina. Publicación especial (*en prensa*).

Gianni, M. and Simpson, W. (2005) The Changing Nature of High Seas Fishing: how flags of convenience provide cover for illegal, unreported and unregulated fishing. Australian Department of Agriculture, Fisheries and Forestry, International Transport Workers' Federation, and WWF International. 83pp.

Godelman, E. (2004) Propuesta para el ordenamiento de la pesquería de merluza en Argentina. CeDePesca, Argentina (http://www.cedepesca.org.ar).

INIDEP (2004) Evaluación del estado del efectivo sur de 41oS de la merluza (*Merluccius hubbsi)* y estimación de la captura biológicamente aceptable correspondiente al año 2004. Informe Tecnico Interno INIDEP No. 17, 35pp.

Kelleher, K. (2004) Discards in the world's marine fisheries: an update. Food and Agriculture Organization of the United Nations, Rome, Italy. FAO Fisheries Technical Paper 470: 131 pp.

New York Times (1994) Argentines Sink Vessel. Wednesday, May 22, 1994.

Prado, J. and Drew, S. (1999) Research and development in fishing technology in Latin America. FAO Fisheries Circular 944: 31pp.

Roux, A. and Piñero, R. (2004) Estado de los fondos de distribución de langostino patagónico *(Pleoticus muelleri)*. Informe Técnico Interno. INIDEP No. 50, 8pp.

Vasconcellos, M. and Cochrane, K. (2005) Overview of world status of data-limited fisheries: inferences from landings statistics. Pages 1-20 in G.H. Kruse, V.F. Gallucci, D.E. Hay, R.I. Perry, R M. Peterman, T.C. Shirley, P.D. Spencer, B. Wilson and D. Woodby (eds.) Fisheries assessment and management in data-limited situations. Alaska Sea Grant College Program, University of Alaska Fairbanks, 958 pp.