

# South American Hakes: The Resource And Its Utilization

GEORGE G. GIDDINGS

## Introduction

The subject of this paper is the several hake and hake-like species of the order Gadiformes that occur in the waters of Peru, Chile, Argentina, and Uruguay (plus the southern extremities of Brazil and Ecuador), and that are harvested by industries of these four nations, in some instances in cooperation with joint venture partners from abroad.

Starting with Peru and moving counterclockwise, the species of interest are: *Merluccius gayi peruanus* (Peruvian silver hake/whiting); *Merluccius gayi gayi* (Chilean silver hake/whiting); *Merluccius polylepsis* ("Merluza del Sur or-española"—southern Chile); *Macruronus magellanicus* ("Merluza de cola", grenadier) harvested in southern Chile and Argentine waters; *Micromesistius australis* ("Merluza de tres aletas" in Chile, "polaca" in Argentina), southernmost of the South American hake-like species, extending from waters in the extreme south of Chile and Argentina out around the Falkland or Malvinas Islands and down into the sub-Antarctic; and, *Merluccius hubbsi*, shared among Argentina and Uruguay and commonly referred to as Patagonian hake/whiting.

Based upon current, and in some

cases rather preliminary resource estimates, exploitation of these stocks to their full potential would in all probability allow combined total annual landings well in excess of 1 million metric tons(t) annually. Assuming foreign markets continue to be reasonably strong, most of this can be expected to continue to be exported abroad in several frozen forms, including blocks. Further, quality of these intermediate products should continue to improve with improvements in vessels and in post-harvest/processing.

## Peru

The Peruvian fishing industry continues to develop following the fundamental policy changes of the present government, which took power in 1975. Peru's hake resource is to be harvested increasingly by vessels under local private ownership to supply a rapidly expanding number of shore plants, rather than by large foreign trawlers under government-to-government joint ventures. Under such ventures Poland and Cuba distributed 75 percent or more of the Peruvian hake catch directly abroad. Their factory trawlers plus a few from other nations had been harvesting on the order of 100,000 t, more or less, during the past 5 years. Recently, the Cuban joint venture was allowed to expire followed by removal of their vessels, and local firms intend to purchase and operate the Polish trawlers and continue to use their established overseas market.

The most agreed upon estimate of the maximum allowable annual catch of

Peruvian *Merluccius gayi*, which is separated by roughly 2,000 miles from the Chilean *M. gayi* stock, is on the order of 200-250,000 t. This could prove quite conservative if the recent Peruvian Marine Institute estimate of a several million ton standing hake stock is borne out. In any event, it will probably be a good while before Peruvian industry will be capable of exploiting hake at the 200-250,000 t level. Current indications are that 1979 hake statistics would be similar to 1978 for Peru.

Besides being relatively soft-textured and deterioration-prone, as is true of merluzas in general, Peruvian hake seems to be more heavily parasitized than comparable stocks, although this is not entirely clear. The Japanese have had trouble making acceptable surimi and gel products from it, and appear to have abandoned their effort there for this and/or other reasons. However, with proper post-harvest handling, processing, and storage, good quality intermediate frozen products (blocks, fillets, butterfly cuts, etc.) can and have been produced. The Peruvian Ministry of Fisheries has had an effort underway aimed at directing a significant percentage of the landed hake catch to finished products for domestic consumption, over and above the modest amount of fresh hake consumed. These include salted, dried and minced hake products, which are produced mainly at the expense of hake meal production which has been declining. As the reoriented Peruvian hake activity develops and grows it is

George G. Giddings is with Fundación Chile, Casilla 773, Avda. Santa Maria 06500, Santiago, Chile. Views or opinions expressed or implied do not necessarily reflect the position of the National Marine Fisheries Service, NOAA.

reasonable to expect that much or most of the catch will continue to be converted into frozen products for export to receptive overseas markets. Precisely which markets should continue to depend at least in part, and in the near term on who, if any, will be the joint venture partners. Additionally, the usual market determinants such as form, quality and volume demanded, and price should exert their collective influence. The same holds for Chile, Argentina, and Uruguay whose near-term hake outlook appears somewhat clearer than that of Peru.

### Chile

In general, of the four subject countries Chile has the most established and diversified seafood processing industry, notably canned pelagics and canned and frozen mollusks and crustaceans. Hake is a more established domestic fresh market commodity in Chile than in the other three, and finished hake products are fairly commonplace. For example, one plant produces batter-breaded sticks and portions for local distribution and a frozen boil-in-the-bag product with sauce. Several retail frozen-branded merluza in fillet and small block forms. The major portion of the total hake catch by Chilean wetfish trawlers plus foreign factory trawlers enter international trade in frozen intermediate forms, however.

The common Chilean hake, *Merluccius gayi gayi*, has centered itself further south in recent years, no doubt due in part to heavy exploitation in the central zone of it, and of langostino and other species upon which it feeds. Also, landings which peaked at over 100,000 t in the late 1960's have fallen off sharply in recent years. However, the stock has become less accessible to the Chilean fleet and may not have diminished proportionately with diminished landings. Known for its considerable vertical and north-south migrations, *M. gayi* is presently trawler-fished mainly below lat. 37°S, much further south than in the past.

Following the decline in *M. gayi* landings there has been a recent upsurge in the harvest of *M. polylepsis*

(merluza del sur, or-española) the largest and perhaps best of the South American hakes, reaching well over 100 cm and 10 kilos. This species is harvested from below lat. 40°S to waters down around Cape Horn (lat. 57° S), along with *Macruronus magellanicus* (merluza de cola or grenadier), and *Micromesistius australis*. The latter is called "merluza de tres aletas" in Chile and "polaca" in Argentina. It is also referred to as southern blue whiting, although larger, and easier to process than North Atlantic blue whiting.

All three of these newly exploited hake resources, plus other demersals are mainly harvested by Japanese factory trawlers which must operate below lat. 43°S. The most recent decree, signed on 28 March and published in the Chilean equivalent of the U.S. *Federal Register* on 9 April 1979, allows for a combined total harvest of 70,000 t below lat. 43°S between 1 April and the end of 1979, when the matter was to be reviewed, and either continued as is or revised.

There is a growing sentiment within the Chilean industry against the presence of foreign factory ships in the south; however, the government continues to favor such arrangements partly on grounds that the waters would not otherwise be fished and assessed. The Chilean Fisheries Subsecretariat is quite conservation/management-minded, and the same holds for Argentine and Uruguayan government fishery regulators who are taking a cautious, measured approach to expansion.

Preliminary biomass estimates of the three newer species below lat. 43° S are 120,000 t for *Merluccius polylepsis*, 210,000 t for *Macruronus magellanicus*, and less than 100,000 t for *Micromesistius australis*. The present estimated combined total allowable equilibrium catch for the three species is put at about 100,000 t, which could be increased as more reliable catch-per-unit-effort data and the like is gathered and evaluated. To this is added the sustainable annual catch of *Merluccius gayi* which is not specified under the aforementioned decree law

since very little *M. gayi* is believed to exist below lat. 43° S. It is presently put at on the order of 75,000-100,000 t. Again, the combined annual landings of the four Chilean hake-like species largely enter the international trade as on-board and on-shore frozen blocks, IQF fillets, etc. The remainder is marketed internally, both fresh and as processed products. Most recently, the latter include minced hake products developed by Foundation Chile for school lunch and other institutional feeding systems.

This pattern of utilization can be expected to continue, and future increases in the harvest of Chilean hakes will in all likelihood go primarily to production of frozen semiprepared products for receptive export markets. Besides the introduction of foreign factory trawlers in the far south of Chile, investments in new shore-based shellfish and finfish processing and freezing capacity has increased sharply within the last few years in the southern regions. There have been insufficient wetfish vessels to supply the newer plants especially, but additional vessels are gradually being introduced and the total fishing effort in the waters of southern Chile can be expected to continue to increase.

### Argentina

Although *Macruronus magellanicus* and *Micromesistius australis* (and possibly *Merluccius polylepsis* stocks, as well as nonhakes) extend over into Argentine waters, there is no fisheries agreement between Chile and Argentina; in fact, the maritime boundary between the two at the tip of the continent below the Tierra del Fuego is a matter of active dispute. The steadily increasing Argentine fishery activity reached 500,000 t landings in 1978, led by hakes which accounted for 68 percent of the total.

Phase one of a two-step national fishery development plan is expected to be completed in 1982 with the achievement of a 1,000,000 t annual landing. Seventy-five percent of this is to be hake (mainly *M. hubbsi* plus *Macruronus magellanicus* or "polaca"). To this end, additional vessels and shore

plants are being phased in both at new ports, and at existing ports which are undergoing improvement.

Notable in the latter case is Mar del Plata which has been the principal fish landing and processing port. Upon reaching the 1-million-t total in 1982, provided harvesting and processing capacity is adequate by then, this limit will be reevaluated, and could be raised to as high as 2 million t total if indications are favorable.

Contributing in a major way to phase one development are joint ventures with about 10 Spanish companies, a consortium of 5 Japanese firms and another with 4 West German firms. To focus the development in the southern provinces, no further companies are being licensed to fish above lat. 40°S. New plants will be allowed to be located between lat. 40° and 46°S; however, they must fish below lat. 46°S.

During phase one, the approximately 21 freezer trawlers now present will be allowed to increase to 26, and the 16 factory ships to 24. In addition, the number of various sized wetfish trawlers and seiners are to reach around 200, in addition to over 200 coastal boats. Port development is intended at favorable locations along the coast, principally below lat. 40°S, and as far down as Ushuaia on the Beagle Channel's north shore at about lat. 55° S, a project that is well underway.

The only more southerly seafood processing port on earth is Puerto Williams, across the Beagle Channel from Ushuaia on the Chilean island Navarino. King crab is the principal resource of interest in that remote area. Puerto Madryn, on a large sheltered bay at about lat. 43°S appears destined to become the base for the Japanese trawler fleet, and, assuming the West Germans extend their venture, theirs as well.

Utilization of Argentine hake landings continues to be dominated by preparation of frozen semiprepared items (blocks, fillets, etc.) for export to Europe, the Orient, and North America in that order volumewise. Approximately 150,000 t of frozen product, most of it from hakes, was exported in 1978. This figure was ex-

pected to double in 1979; and in 1982, the final phase-one year, around 500,000 t of frozen product is projected to be exported. Hakes will continue to account for most of this, as they must make up 75 percent of the total harvest according to the Subsecretary of Fisheries—State Secretary for Maritime Interests, which regulates commercial fishing activity.

Estimates of the hake biomass in Argentine waters range from the FAO estimate of 1-1.5 million t to the 6 million t or more Soviet estimate. However, much more data needs to be, and is being, gathered and analyzed, especially in southern waters, and the true standing stock of all hakes off Argentina is perhaps somewhere between the two estimates.

The *Merluccius hubbsi* stock in particular exhibits a wide seasonal migration, being concentrated above lat. 40° S during the winter months of June-September when it is readily accessible to the Mar del Plata and Uruguayan fleets. During the summer months from about November into March, *M. hubbsi* is concentrated well below lat. 40°S, and between the seasons it makes its north-south, south-north migrations.

This has contributed significantly to product quality problems whereas during the warmer months of the year the fleet is well to the north of the main hake stocks, requiring turn-around trips of several days for wetfish trawlers. Boxing onboard with ice is a rather common practice now, and as port and processing facilities increase below lat. 40°S and more modern wetfish vessels are phased in the situation should improve further. In general, handling, processing and quality assurance practices are improving to meet the challenge of exporting high quality products from a difficult resource to the more demanding and lucrative markets.

### Uruguay

The "newcomer" to hake fishing has made considerable strides in a relatively brief period of a few years. The Uruguayan industry features new plants and vessels, and, a high degree of emphasis on quality assurance under

the National Fishery Development Plan of 1974, which is under the direction of the National Fishery Institute, created in 1975.

As with Argentina, the industry of Uruguay must obtain a license from the State to introduce new vessels and plants. Under the Treaty of Río de la Plata and its Maritime Front, the two countries share a common fishing zone extending east 200 nautical miles from the wide mouth of the Río la Plata which encompasses about two degrees of latitude in the north-south direction.

Except in the summer months of December through February when *M. hubbsi* is centered south of the practical range of the Uruguayan fleet, this zone plus adjacent waters are quite rich in *M. hubbsi*. Brazil typically takes from 20,000 to 40,000 t of *M. hubbsi* from waters off its southern extreme above Uruguay, but virtually entirely for internal consumption.

Under the first phase of the Uruguayan plan which is to be fulfilled during the decade of the 1980's, some 64 new wetfish trawler/seiners, 29-33 m in length, are to be phased into the fleet to supply shore processing plants at the capital of Montevideo, nearby Piriápolis, and La Paloma to the northeast.

La Paloma is being developed into a major port destined to support ten processing plants plus associated vessels by 1990. By this time, 100,000 t of raw material is projected to be landed there, with another 100,000 to be landed at Montevideo, which is to undergo port improvement and further plant expansion. Uruguay's fishery development plan is oriented entirely toward land-based processing, whereas the governments of Argentina and Chile feel the need for foreign factory trawlers, in the near term at least, to open up their remote and difficult southern offshore waters to commercial fishing.

Of the Uruguay phase one target of a 200,000 t total landing, approximately half, or 100,000 t, is to be *M. hubbsi*, mainly for processing into frozen interleaved and laminated blocks, fillets, H&G, etc. for export, with emphasis on the North American market. In

1978, a total of 74,200 t was landed by the Uruguayan fleet, nearly all at Montevideo. Of this, 56 percent was *M. hubbsi*, the remainder consisting of croaker, seatrout, anchoita, squid, and others that Uruguay and Argentina also share. The 74,200 t total landing generated 40.3 t of product for market, of which 79 percent was frozen forms, nearly all for export. This percentage has been increasing at an annual rate of 10 percent and more.

As with the other frozen hake exporters of South America, depending upon market requirements, blocks and fillets are shipped skin-on, regular skinned or deep skinned ("defatted"), boneless or pinbone in, etc. Like the better plants in the other countries, the Uruguayan plants give attention to such details as deparasitizing, removal of belly flaps, black membranes, residual bones, and, to good technique in making up laminated blocks for freezing.

In general, post-harvest handling is continually improving, with boxing on board with ice for rapid chilling, minimizing physical damage, and expediting transfer from vessels to plants becoming quite commonplace. In the case of wetfish trawlers the size of the vessels and the hauls has precluded heading and/or gutting onboard in Uruguay as well as the others.

### **Summary**

In summary, it can be said that the four South American countries possess considerable resources of hake/whiting and like species. While there is ample room for further progress, their industries are increasingly meeting the challenge of handling, processing, and distributing comparatively delicate, deterioration-prone fish in such a way as to meet the requirements of the most demanding importers, in large measure with the assistance of the importers themselves. Presently, and in the foreseeable future, the emphasis is on hakes as foreign exchange earners; however, should the time come, the emphasis could be shifted to exploiting these very large resources as a major source of protein for their own and neighboring populations.