
Pacific Highly Migratory Pelagic Fisheries

INTRODUCTION

The fishes in this group range the high seas and often are outside U.S. fisheries management jurisdiction. Some species are sought vigorously by both commercial and sport fishermen. The status of many is either uncertain or unknown.

During 1976–80, the eastern tropical Pacific tuna fishery expanded and was dominated by the U.S. fleet. Fishing became less profitable in the 1980's, and many U.S. fishermen quit or moved to the central-western Pacific, leaving Mexico, with more than 50 purse seiners, the dominant fleet in the eastern tropical Pacific. In the next decade, the U.S. fleet declined to about 7 vessels in 1993–97 in response to domestic regulations that addressed dolphin mortality concerns. Purse seiners (all countries) in the eastern tropical Pacific in 1997 numbered about 189. Until 1980, the Inter-American Tropical Tuna Commission (IATTC) regulated the international fishery with catch quotas. Since then, IATTC regulations have been suspended because Mexico with its dominant fleet is not a Commission member. Currently, there is no international tuna management in the eastern tropical Pacific; each coastal nation regulates fishing within its own exclusive economic zone (EEZ).

Also, since there is not yet an overall resource management program in the central-western Pacific, the South Pacific Forum Fisheries Agency (FFA), which represents the South Pacific island nations, has instituted a licensing program for foreign (distant-water) fishing fleets through access agreements. The U.S. fleet is currently limited to 55 purse seiners in the region under an access agreement called the South Pacific Regional Tuna

Treaty. The FFA opened multilateral talks in 1994 for the purpose of developing a conservation and management treaty for tropical tuna species and South Pacific albacore. These talks are continuing at an accelerated pace.

Currently, there is no international management regime for the pelagic species in the North Pacific. An informal arrangement has existed between Japan and the United States for assessing the status of North Pacific albacore (scientists from Canada, Taiwan, and the Republic of Korea also participate.) Recently, the United States and Japan, through a bilateral agreement, established the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean to monitor North Pacific fisheries as a precursor for a management regime.

The temperate-water bluefin tuna is not considered here, as most catches have been relatively minor and taken off California in recent years. This species is taken incidentally while purse seining for other species (anchovy and mackerel; yellowfin and skipjack tunas). It is also taken sporadically by the Hawaii-based longline fishery on the northern swordfish grounds.

U.S. billfish harvests (except for swordfish) have been dwarfed by foreign harvests (mostly from longline fisheries). There is no international authority managing these species in the Pacific, although they are under consideration in the FFA talks. U.S. management authority for billfish and tuna in the EEZ rests with the Western Pacific Regional Fishery Management Council for central and western Pacific waters, and with the Pacific Fishery Management Council for North American waters. In the past, the latter has del-

Unit 18

NMFS SOUTHWEST
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La Jolla
California

and

Honolulu Laboratory,
Honolulu
Hawaii

Table 18-1

Productivity in metric tons and status of Pacific highly migratory pelagic species.

Species/Area	Recent average yield (RAY)	Current potential yield (CPY)	Long-term potential yield (LTPY)	Fishery utilization level	Stock level relative to LTPY
Yellowfin tuna (central-western Pacific) ¹	335,451	600,000	600,000	under	above
Yellowfin tuna (eastern-tropical Pacific) ¹	257,333	300,000	unknown	full	near
Skipjack tuna (central-western Pacific) ¹	950,527	2,000,000	2,000,000	under	above
Skipjack tuna (eastern-tropical Pacific) ¹	135,967	135,967	135,967	under	near
Albacore (North Pacific) ¹	73,667	80,000	80,000	under	near
Albacore (South Pacific) ¹	36,733	36,733	36,733	unknown	near
Bigeye tuna ²	132,615	160,000	160,000	full	near
Blue marlin ²	23,278	23,278	23,278	over	below
Black marlin ²	2,621	2,621	2,621	unknown	near
Striped marlin ²	11,649	11,649	11,649	under	near
Sailfish and shortbill spearfish ²	4,360	4,360	4,360	unknown	near
Swordfish ³	29,794	29,794	25,000	unknown	near
Wahoo ²	160	160	160	unknown	near
Dolphinfish ²	23,020	23,020	23,020	unknown	near
Pelagic sharks ²	32,243	32,243	32,243	unknown	unknown
Total	2,049,418	3,439,825	3,435,031		
U.S. Subtotal ⁴	253,606	253,116	253,116		

¹1995–97 average.

²1993–95 average.

³1994–96 average.

⁴U.S. subtotal is U.S. landings of tunas, swordfish, and billfish for 1993–95; 1995–97 data are unavailable.

egated management to the State of California for swordfish, striped marlin, and some sharks. Currently, there is renewed interest by the Pacific Fishery Management Council in developing billfish, tuna, and shark management plans.

Species and Status

Highly migratory pelagic species include tropical tunas (yellowfin, bigeye, and skipjack), albacore, marlins, spearfish, sailfish, swordfish, sharks, and other large fishes. Most are caught commercially, but some, especially marlins, support important recreational fisheries as well.

Tropical Tunas

Longline gear is used to catch yellowfin and bigeye tunas across the Pacific, whereas the purse seine is the primary gear in the eastern and the western tropical Pacific for capture of yellowfin and skipjack tunas. Purse seine fishing is conducted generally between latitude 20°N and 20°S.

Longline fishing extends to higher latitudes (e.g. to 40°N). Other gears used in the central-western Pacific fisheries include ring net, handline, troll, and pole-and-line. Purse seiners, dominated by U.S. and Japanese fleets but with substantial fleets from Korea and Taiwan, take 30–50% of the yellowfin tuna catch in the central-western Pacific. In 1996, the total number of purse seiners in the central-western Pacific was more than 200, including 40 U.S. seiners. Virtually all skipjack tuna is taken by pole-and-line and purse seine. Most of the bigeye tuna catch is taken by longline gear.

Mexico is the primary fishing nation in the eastern tropical Pacific. Others include the United States, Vanuatu, Venezuela, and some other coastal nations. Major fishing fleets in the central-western Pacific come from the United States, Japan, Republic of Korea, Philippines, and Taiwan. Current, recent, and long-term potential yields for the various species are given in Table 18-1.

More skipjack tuna are caught than any other tuna species. The recent annual yield of Pacific skipjack tuna taken by U.S. and foreign fleets is

950,527 metric tons (t) from the central-western Pacific and 135,697 t from the eastern tropical Pacific (Figure 18-1); recreational catches are small. The species is believed to be underutilized, with the long-term potential yield for the central-western stock between 4,000,000 and 6,000,000 t. The annual dockside ex-vessel revenue of the U.S. and foreign Pacific skipjack tuna catch is about \$869,000,000, and for yellowfin tuna it is well in excess of \$474,000,000. These figures are based on a conservative dockside price of \$800/t for both species. The recent average yield of yellowfin tuna for the entire Pacific is about 592,784 t (Table 18-1), distributed about equally between the eastern tropical and the central-western Pacific (Figure 18-2). Recent assessments of yellowfin tuna indicate that the long-term potential yield for the eastern tropical Pacific is about 300,000 t, making this resource fully utilized. The long-term potential yield for the central-western Pacific is estimated at 600,000 to 670,000 t, indicating the stock is underutilized.

The recent average yield of bigeye tuna for the entire Pacific is about 133,000 t (Table 18-1) generating ex-vessel revenues of about \$1 billion, with most of the catch taken by foreign longline fisheries. Bigeye tuna is mostly sold for raw consumption as Japanese-style "sashimi" and brings the highest dockside price of any tropical tuna (about \$7,000/t). The best available estimates of long-term and current potential yield are about 160,000 t (Table 18-1), and the current level of fishing effort is the highest recorded to date. Recent catches and catch rates have been lower than seen during the 1990–92 period, and the stock may be fully utilized.

Albacore

Albacore is fished from the northern limits of the North Pacific Transition Zone to about latitude 15°N, and from Japan to North America. In the South Pacific, it is fished from about latitude 15°S to the southern limits of the Subtropical Convergence Zone and from South America to Australia.

In the North Pacific, albacore is fished primarily by longline, pole-and-line, trolling, and until 1992, drift gillnet. Longline gear is used in the

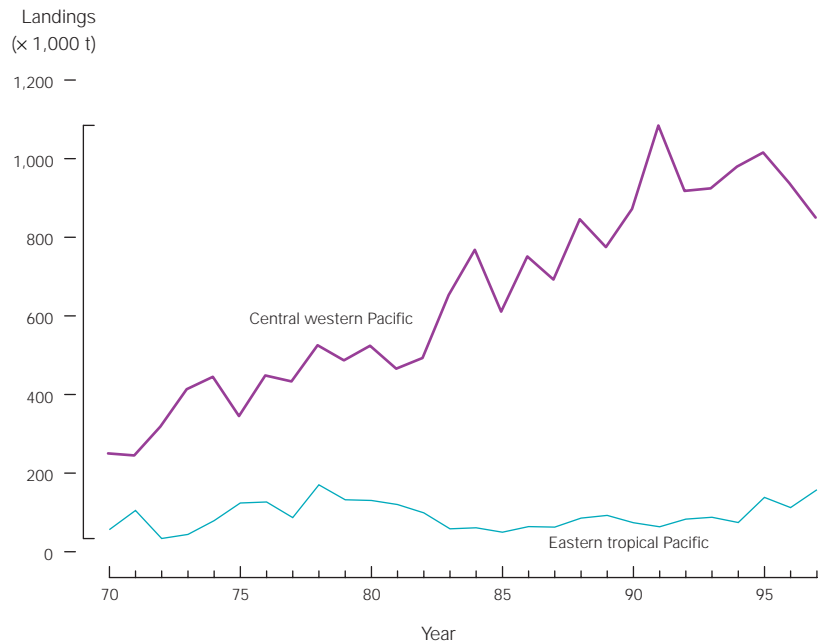


Figure 18-1
Landings of skipjack tuna in the Pacific Ocean region, 1970–97, in metric tons (t).

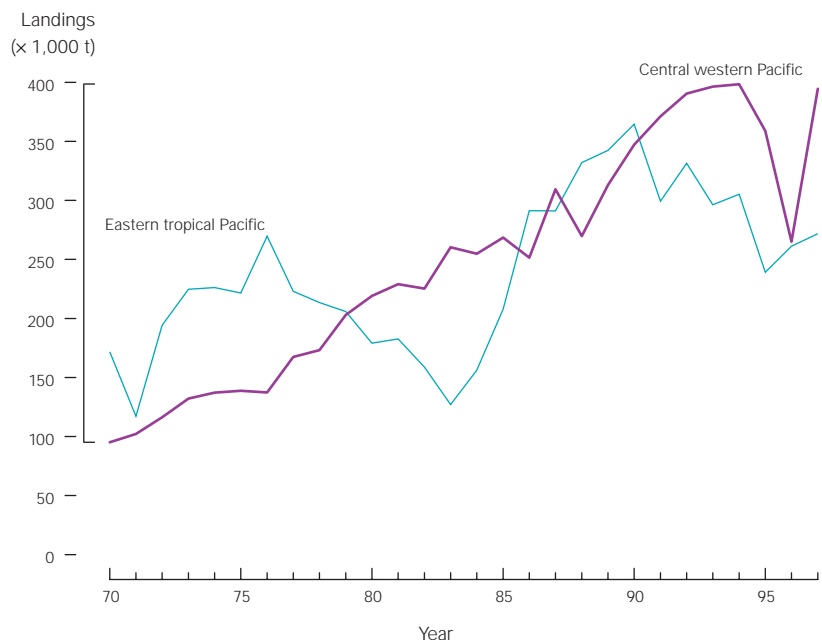


Figure 18-2
Landings of yellowfin tuna in the Pacific Ocean region, 1970–97, in metric tons (t).

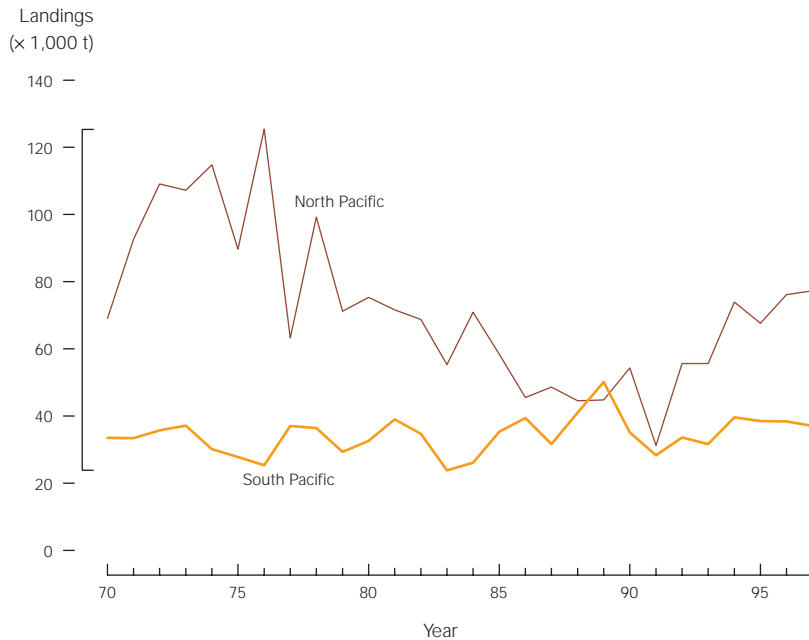


Figure 18-3
Landings of albacore tuna in the Pacific Ocean region, 1970–97, in metric tons (t).

lower latitudes and accounts for about 20–25% of the current catches. The surface fisheries (pole-and-line, troll) operate in the higher latitudes of the North Pacific Transition Zone and account for 75–80% of the catches. The U.S. fishery extends from the middle of the Pacific Ocean to the North American coast and uses between 500 and 2,000 vessels. Based on a dockside price of \$2,200/t, the annual ex-vessel revenue of the North Pacific albacore catch is about \$145 million.

South Pacific albacore is fished primarily by longline and trolling. As in the north, longliners operate nearer the equator than trollers. Surface gear is fished in the Tasman Sea and in the Subtropical Convergence Zone at about longitude 160°W. In 1996, about 50 U.S. trollers fished the South Pacific.

Pacific albacore (both the north and south stocks) has a long history of exploitation (Figure 18-3). Recent development of a large surface fishery in the South Pacific, in addition to the longline fishery, has changed the previous stock assessments from fully exploited, under a longline-only fishery, to unknown. No long-term potential yield has yet been estimated, but a comprehensive assessment is needed due to the opposing effects of a rapid expansion of the troll fishery in the late 1980's and termination of the driftnet fishery in

1991.

In the North Pacific, total catches, catch rates, and fishing effort in the U.S. troll fishery and the Japanese pole-and-line fishery declined until the early 1990's then began increasing through 1996 (Figure 18-3). Current assessments estimate long-term potential yield between 80,000 and 104,000 t. This follows a period of higher stock utilization at or above the long-term potential yield in the 1970's. This early high production, coupled with a drift gillnet fishery from 1980 to 1992 (for which statistics are incomplete), probably overutilized the stock. It appears that the stock has recovered from the earlier period of overfishing; however, increasing catches may once again threaten the stock.

Swordfish

Swordfish are distributed throughout the temperate, subtropical, and tropical waters of the Pacific. Much of the Pacific-wide catch is taken by the Japanese longline fishery directed at tunas, some is taken by the U.S. swordfish longline fishery, and the rest is taken by surface gears such as harpoons, handlines, coastal drift gillnets and, until 1993, high-seas drift gillnets. Coastal fisheries occur off the United States, Japan, Taiwan, Mexico, Chile, and Australia. Catches have increased throughout the 1980's and 1990's (Figure 18-4), averaging about 30,000 t in recent years (Table 18-1).

The stock structure and status of Pacific swordfish stocks are unclear. Several studies suggest more than one Pacific stock. The most recent assessment assumed a single Pacific stock and suggested that the stock was somewhat underutilized. However, this assessment was limited to data through 1980. More recent statistics on catch and effort are not available, but as total catch has increased so has the crude estimate of long-term potential yield. The recent average yield for 1993–95 exceeds the estimated long-term potential yield (Table 18-1).

From 1989 to 1993, production from the U.S. domestic longline fishery in Hawaii increased rapidly, reaching 5,942 t and an ex-vessel revenue of \$26,100,000 in 1993. Catches declined to 2,504 t in 1996. The 1995 production represents 9% of the total Pacific production and 50% of the central-eastern North Pacific production.

The production from the U.S. domestic gillnet and harpoon fisheries located primarily off California increased markedly from 1975 to 1985, when a peak catch of 2,400 t was landed. The fishery currently has a recent average annual yield of 1,124 t for about \$5,000,000 in ex-vessel revenue.

Other Billfishes and Pelagics

Species included here are the blue, black, and striped marlins; sailfish, shortbill spearfish, wahoo, dolphinfish, and several oceanic sharks (requiem, thresher, hammerhead, and mackerel). They generally range from North America to Asia and between the North and South Pacific convergence zones. They are generally more abundant near islands, continental slopes, seamounts, and oceanic fronts, and many are important to local economies. They are caught by foreign and U.S. recreational and commercial fishermen.

U.S. commercial fishermen in the western and central Pacific primarily use longline, troll, and handline gear to catch marlins, spearfish, wahoo, and dolphinfish. Recreational fishing gears include rod-and-reel and handline. Sharks are taken by longline in the central North Pacific and by harpoon and drift gillnet off North America.

Because of the many species in this “other” category, no accurate dollar value can be calculated for the annual catch. However, the U.S. catch of blue and striped marlin is worth about \$2,000/t ex-vessel, and the U.S. catch of wahoo and dolphinfish is worth more than \$4,000/t.

Three species dominate the reported catches of “other pelagics”: blue and striped marlins and sharks (Figure 18-5). Catches in this category by U.S. fisheries for the central and western Pacific increased steadily through the 1980’s, leveling out in the 1990’s. Pacific-wide shark catches in the carcharhinid and requiem shark categories reported to the Food and Agriculture Organization of the United Nations total about 22,000 t/year, but pelagic shark catches are reported by only a few nations. The total Pacific harvest of pelagic sharks is unknown.

The status of most species’ stocks is unknown or uncertain. Assessments using data through 1985 indicated that striped marlin were utilized slightly below their long-term potential yield, and blue

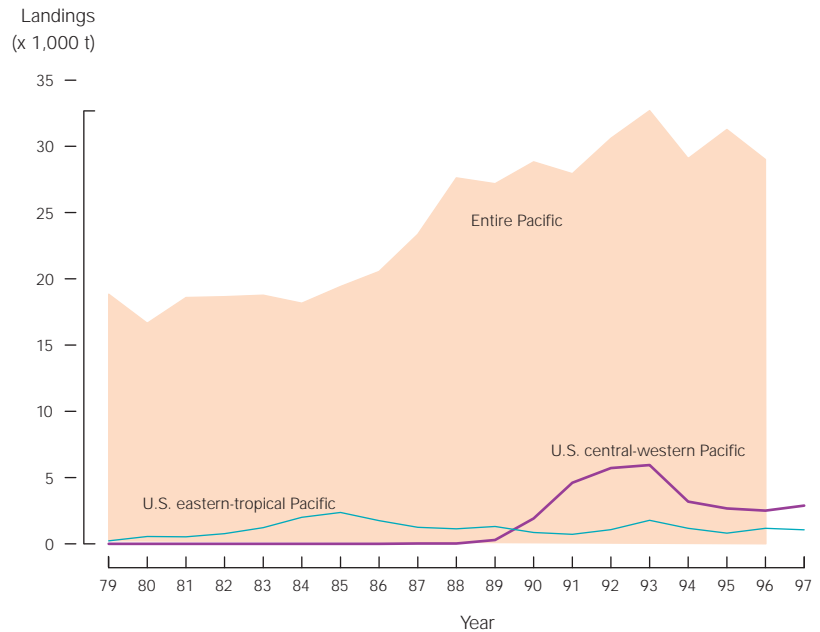


Figure 18-4
Landings of swordfish in the Pacific Ocean region, 1979–97, in metric tons (t). Pacific-wide data unavailable for 1997.

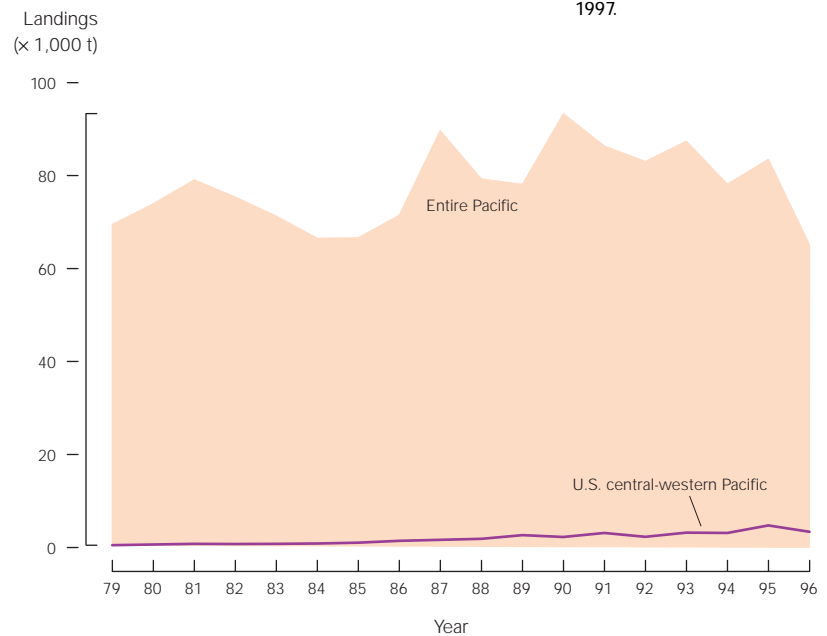


Figure 18-5
Landings of billfish and sharks in the Pacific Ocean region, 1979–96, in metric tons (t). Data for 1997 not available.

marlin were fished above their long-term potential yield; however, new data are needed to confirm or dispute these findings. The condition of virtually all shark species remains unknown.

ISSUES

Management Concerns

There are two primary issues for the management of pelagic species in the Pacific. The first is the development and implementation of comprehensive international plans for gathering and reporting fishery statistics; the second involves setting up conservation and management regimes to encompass all interests and ensure sustainable fisheries. Both the South Pacific Forum Fisheries Agency treaty talks and the recently begun Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean appear to be addressing these concerns. The poor quality of some data and the lack of current data in several fisheries prevent conducting accurate and up-to-date stock assessments, developing informed management options, and preparing pragmatic advice for rational exploitation and conservation of the resource.

Another major issue affecting virtually all fisheries to some extent is the bycatch taken during fishing operations. Bycatch is defined as the capture or mortality of nontarget species and target species which are not retained (discards). Some examples of bycatch include catches of small tuna discarded by purse seine fisheries; takes of seabirds, including endangered species, and sharks discarded by longline fisheries; the impact of chase and encirclement on dolphins in the eastern tropical Pacific purse seine fishery; and the indiscriminate catch, killing, and discarding of nontarget species in purse seine operations around fish aggregating devices and other floating objects. Both U.S. and foreign fisheries are involved in bycatch issues.

Within the U.S. EEZ of the central-western Pacific, including Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands, the Western Pacific Regional Fishery Management Council has developed, and the Secretary of Commerce has approved, a fishery management plan for pelagic species. The plan

specifically addresses concerns about the expanded Hawaii longline fleet and the potential for interactions among longliners, trollers, and handliners by placing a cap on the number of permits issued to longliners and establishing nearshore zones closed to longlining. At the Council's behest, the National Marine Fisheries Service implemented a mandatory logbook and reporting system in the region's domestic longline fleet to collect statistics for fishery monitoring. Research is under way to analyze the fishery statistics and to evaluate the effectiveness of the longline fleet limits. Also affecting data collection is the recently enacted High Seas Fishing Compliance Act, which requires licensing and logbooks for all U.S. vessels fishing on the high seas.

Although they fish the same swordfish resource as the Hawaii-based vessels, longline vessels operating out of California and Alaska have not been subject to the management regulations developed by the Western Pacific Regional Fishery Management Council. Until their elimination in 1993, high-seas drift gillnet fisheries had taken a dominant share of the North Pacific albacore catch. Recent developments indicate that the Pacific Fishery Management Council is considering development of regulations in the U.S. west coast EEZ, and presumably in common with high-seas regulations governing the western Pacific. In the South Pacific, the interaction between the established foreign longline albacore fishery and the surface fishery (predominantly from the United States) needs attention, particularly if allocation of available yield between the fisheries becomes an issue. A domestic longline fishery for albacore has started in American Samoa. A similar but larger fishery in Western Samoa has raised gear conflicts and competition issues.

The North Pacific albacore stock appears to have been overutilized in the 1970's and 1980's, possibly due to high surface fishery catches and decadal changes in ocean productivity. In the 1990's, the stock appears to have recovered, aided by reduced catches and a productivity increase. However, it appears that the stock may not support catches as high as those taken in the early 1970's. Creation of an international arrangement to manage the stock is another issue that needs attention, particularly if the fishing nations want

to reap the benefits of a recovered stock and prevent another overfishing cycle.

Scientists recognize that at least one billfish species, the Indo-Pacific blue marlin, is depleted over its range, but no international management mechanism exists to rebuild the stock. Similarly, thresher and mako sharks taken in the U.S. west coast drift gillnet fishery may need protection from overexploitation. The Pacific Fishery Management Council has the jurisdiction to address this need.

The potential take of endangered Hawaiian monk seals, endangered and threatened sea turtles, and seabirds is also of concern. The monk seal problem has been addressed by the Western Pacific Regional Fishery Management Council through a strict prohibition of longlining within a 50-mile area surrounding the Northwestern Hawaiian Islands. Sea turtle and seabird takes are monitored using data gathered by fishery observers on longline vessels.

Scientific Advice and Adequacy of Assessments

Population levels of the billfishes and other species are generally unknown or out of date: There is no comprehensive international mechanism to collect and share fishery data on the Pacific-wide stocks, including those portions of the stocks that range in U.S. waters, although the Interim Scientific Committee for Tuna and Tuna-like Species is addressing the issue. Basic biological data (beyond catches) are also lacking or grossly inadequate for most of these species. This limits determination of the current condition of the stocks. Bycatch in all fisheries is another issue.

The impacts of the U.S. longline fleet on swordfish and other resources in the EEZ around Hawaii and in the central Pacific are unknown, but the catches are being monitored, and research is under way to better assess the stocks.

Progress

Research has been focused on selected issues, and progress has been made for several species. However, on the whole, the number of species and issues remains more than can be addressed, given current agency resources.

For central-western Pacific tunas, informal international scientific meetings are annually convened by the South Pacific Forum Fisheries Agency to assemble fisheries statistics, evaluate fishery developments and assess the condition of the stocks. For tuna and tuna-like species in the North Pacific, the Interim Scientific Committee has been established, and initial meetings have been held regarding some species and fishery statistics. For many central and South Pacific fisheries, multi-lateral treaty discussions may eventually lead to needed management arrangements.

Management of the domestic fisheries has been successful in eliminating gear conflicts among longline, troll, and handline fisheries. Limited entry and area closures in the Hawaii-based longline fishery have limited the growth of the fishery and reduced nearshore longline catches of tuna, billfish, and other pelagic species important to troll and handline fisheries, thus reducing the potential for fishery interaction. At the same time, the total yield of the Hawaii-based longline fishery has increased during the 1990's due to an expansion of fishing effort, modifications of the seasonal limits of the area closures, and changes in areas of operations. Area closures implemented in the Northwestern Hawaiian Islands to prevent interaction of the longline fleet with the endangered Hawaiian monk seal have been fully successful.

FOR FURTHER READING

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