FISHERY COUNTRY PROFILE	Food and Agriculture Organization of the United Nations	FID/CP/USA
PROFIL DE LA PÊCHE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	
RESUMEN INFORMATIVO SOBRE LA PESCA POR PAISES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	February 2005

THE UNITED STATES OF AMERICA

I. General geographic and economic data

Land and Water Area[ii]:	Land: 9,631,418 sq. km // *water:* 469,495 sq km
EEZ area (to 200 miles) [iii]:	3.36 million sq. nm = 11.5 million sq. km
Length of coastline[iv]:	19,924 km
Population (2005) [v]:	US: 295,184 // World: 6,410,524,000
GDP (2004) [vi]:	US$ $11,815 billion
Per Capita GDP (2003)[vii]	US$ 37,898
Agriculture (Farms) GDP (2003) [viii]:	US$ 84.8 billion, 0.8 % of total US GDP
Forestry, Fishing, & Hunting GDP (2003) [ix]	Combined US$ 29.1 billion, 0.3 % of US GDP

II. Fisheries data

(2003) [x]	Production	Imports	Exports	Food supply	Per caput sup.*
	mt in live weight - except mollusks				kg/year
Fish for direct human consumption	3,420,000	4,390,000	2,450,000	5,360,000	26.8
Fish for animal feed and other purposes	900,000	310,000	620,000	590,000	4.2
TOTAL	4,320,000	4,700,000	3,070,000	5,950,000	31.0
* Per capita supply excludes exports, is live weight, and includes military abroad					

1. Estimated employment

Primary sector: The number of vessels greater than 5 net tons with commercial fishing documents is about 36,150 (2005)[xi] In an internal NMFS analysis of commercial fishing craft that were licensed and actively fished during 2004, there were about 19,350 vessels and 17,300 boats. In aggregate, the 19,350 vessels exceeded 1,100,000 gross registered tons. However, in some states, the statistics on fishing craft, especially boats, may be incomplete, making this a minimum estimate.[xii]. There are no complete published data on employment in the primary sector.

Secondary sector: 67,472 (2002) working in 935 plants and 2,446 wholesalers[xiii]

2. Gross value of fisheries output (2003) [xiv]:

Commercial fisheries contributed $31.5 billion of the $11,040 billion[xv]GDP (0.29%) in 2003 and recreational fisheries contributed about $12 billion. The 2003 US marine recreational finfish catch including fish kept and fish released (discarded) on the US coasts excluding Texas and Alaska but including Hawaii and Puerto Rico was an estimated 455.0 million fish taken on an estimated 82.0 million fishing trips. The harvest (fish kept or released dead) was estimated at 207.0 million fish weighing 122,454 mt (270 million pounds). Revenues from aquaculture production of 393,400 mt were about $866 million in 2002: the total contribution of this production to GDP has not been calculated. US consumers spent an estimated $61.2 billion for fishery products in 2003. This includes $42.0 billion at food service establishments (restaurants, carry-outs, caterers, etc.); $18.9 billion in retail sales for home consumption; and $290.4 million for industrial fish products. The contribution of all 3 sectors to GDP, in total, is under one %.

3. Trade (2003) [xvi]:

Value of imports: US$ 21.3 billion (second largest in the world)
Value of exports: US$ 12.0 billion (fourth largest in the world)

4. US Marine Recreational Fisheries[xvii]:

Number of Anglers: 13,000,000 Number of Angler Trips: 82,000,000
Metric Tons Harvested: 122,454 Number of Fish Harvested: 207,228,000
Number of Fish Released: 248,314,000

III. Fishery sector structure

1. Overall fishery sector

US fisheries are pursued on all coasts in coastal waters and in the US Exclusive Economic Zone (EEZ), as well as in many rivers and lakes throughout the country. The catch combined with aquaculture production makes the US the 4th ranked fishing nation with 4 percent of the landings in 2002. In 2003, finfish accounted for 87% of US landings but only 45 percent of the value[xviii].

The US fishing fleet is quite diverse in terms of sizes and gear types varying significantly among fisheries as well as among geographic areas. One consequence of the size and diversity of the harvest sector is that management of all US fisheries with a single policy is not feasible. Even individual fleets are quite diverse, and each fishery has unique biological, economic, and sociological characteristics that make broad-based policy impractical. On the other hand, regulation on a fishery-by-fishery basis is not practical or effective. Vessels are extremely mobile and are often able to change gear types quite readily.

Technological advances have played an important role in the development of US fisheries, particularly in the harvesting sector, but also in the way seafood is processed, distributed, and marketed. The US fleet evolved from mainly sailing vessels in the late 1800's, to steamers and schooners with auxiliary gasoline-powered engines in the early 1900's, and finally to an almost complete conversion to diesel-powered vessels by the 1930's. Concomitant increases in size and speed allowed vessels to fish in ever more distant waters. Sophisticated gear types were available early on: purse seiners were in use in Alaska by 1870, followed by longliners in 1885; otter trawl technology was introduced to groundfish and shrimp fisheries on all coasts during the early 1900's. Dozens of foreign factory ships were pulse fishing herring, haddock, halibut, and salmon from traditional US fishing grounds by the late 1960's. Other advances include: onboard refrigeration, the Puretic power block for seine retrieval, double trawls, durable nylon and synthetic fibre for nets and seines, sophisticated electronics for navigation and location of fishing grounds and fish, and aircraft to locate schools of fish.

The fishing industry is one of the most hazardous in the US; on average 78 deaths were recorded per year between 1992 and 1999 US commercial fishing vessels. The leading factors to casualties are: (1) inadequate preparation for emergencies, (2) poor vessel and/or safety equipment conditions, and (3) lack of awareness of or ignoring stability issues. The US Coast Guard seeks to improve safety through education, public awareness, voluntary examination of vessels, and enforcement. Coast Guard standards, which do not require inspections, are lower than standards for other domestic commercial vessels. [xix]Many fishermen accept that fishing is dangerous and staunchly defend their independence. They oppose additional regulation and many proposed laws to increase safety have been defeated.

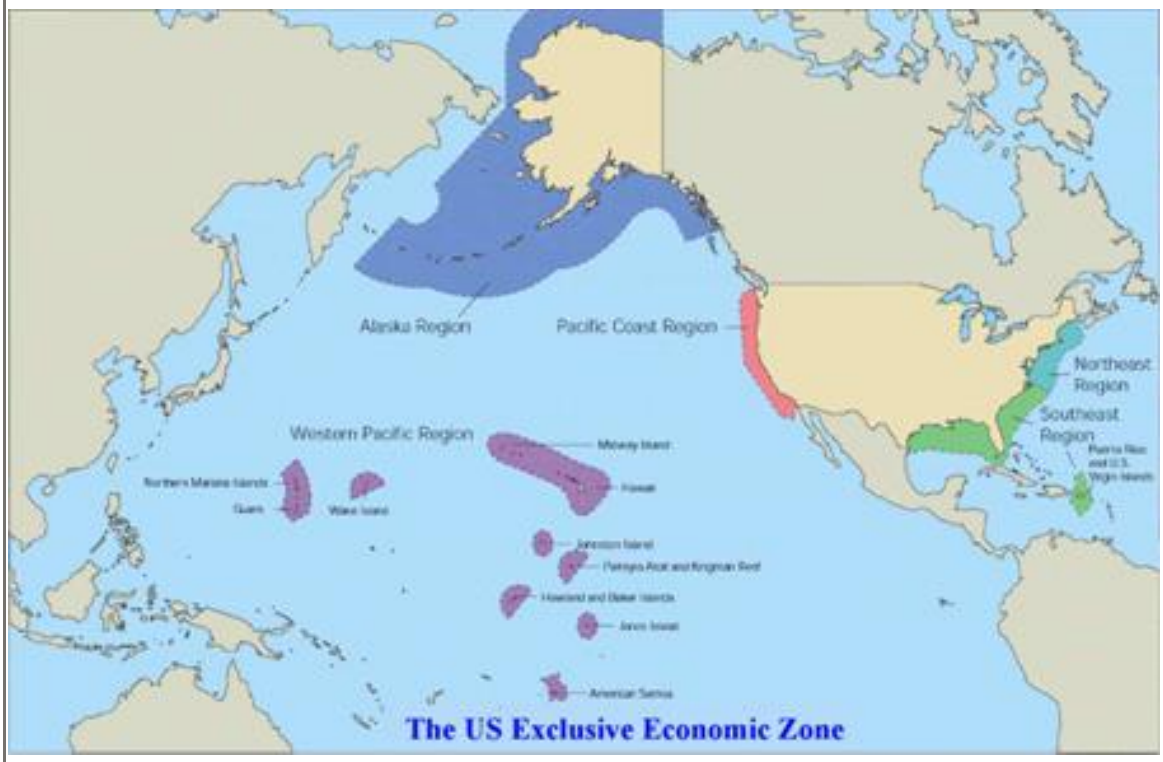
Many fisheries have allocation disputes, including those between commercial and recreational fishermen, between various subsets of the commercial harvesting sector, and between them and environmental interests. Solutions used to ensure the health of fishery resources while resolving allocation issues typically include imposition of increasingly strict and complex regulations.

2. Marine sub-sector[xx]

I. Catch profile

The US EEZ is the largest in the world, encompassing 1.7 times the area of the US and territorial landmass. The EEZ is located 3Ð200 nautical miles (n.mi.) seaward of the 48 contiguous states, Alaska, Hawaii, and US-affiliated islands except 9-200 n.mi. off Texas, the Florida Gulf Coast, and Puerto Rico. The EEZ has at least 8 Large Marine Ecosystems (NE & SE continental shelf, Caribbean Sea, Gulf of Mexico, California Current, Insular Pacific Hawaiian, Gulf of Alaska, and Eastern Bering Sea). Fisheries developed in the US as each area was settled, whether the original aboriginal peoples or the post Columbian arrivals. Inshore marine fisheries are managed by states, or regional Marine Fisheries Commissions, which usually coordinate state actions, and even municipalities or counties in some areas. Fisheries in the EEZ beyond state jurisdiction (three nautical miles in most states) are the responsibility of the Federal system, whose primary institutions are the 8 Fishery

Management Councils and NMFS. Information about this management system is available at http://www.nmfs.noaa.gov/sfa/sfweb/index.htm.

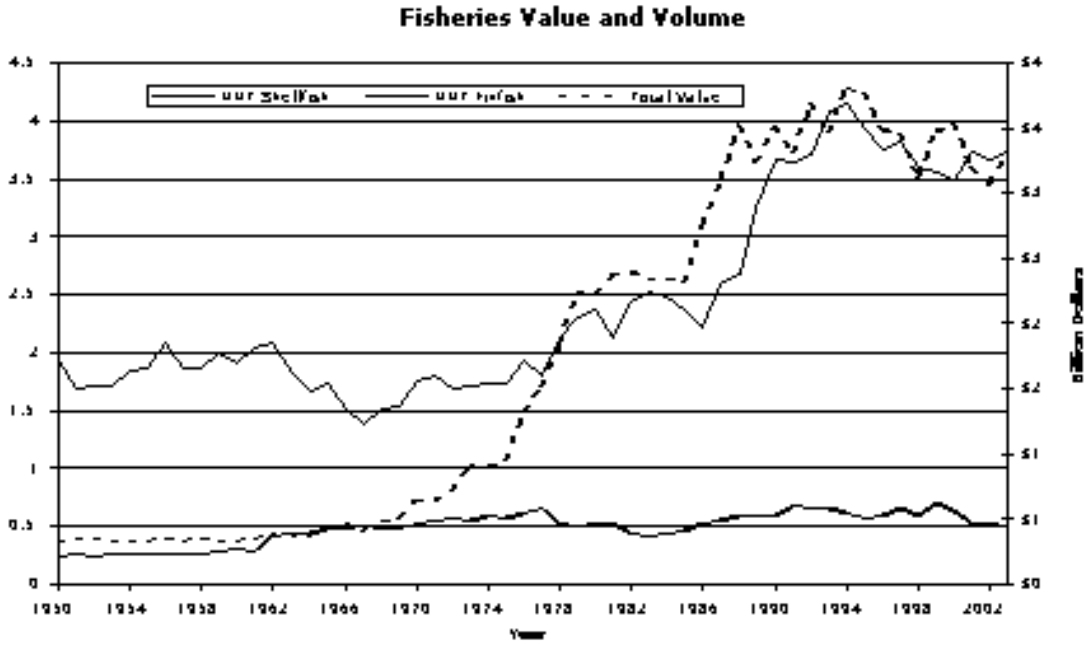


Major US Domestic Species Landed in 2003

Ranked By Quantity and Value (Numbers in millions) [xxi]

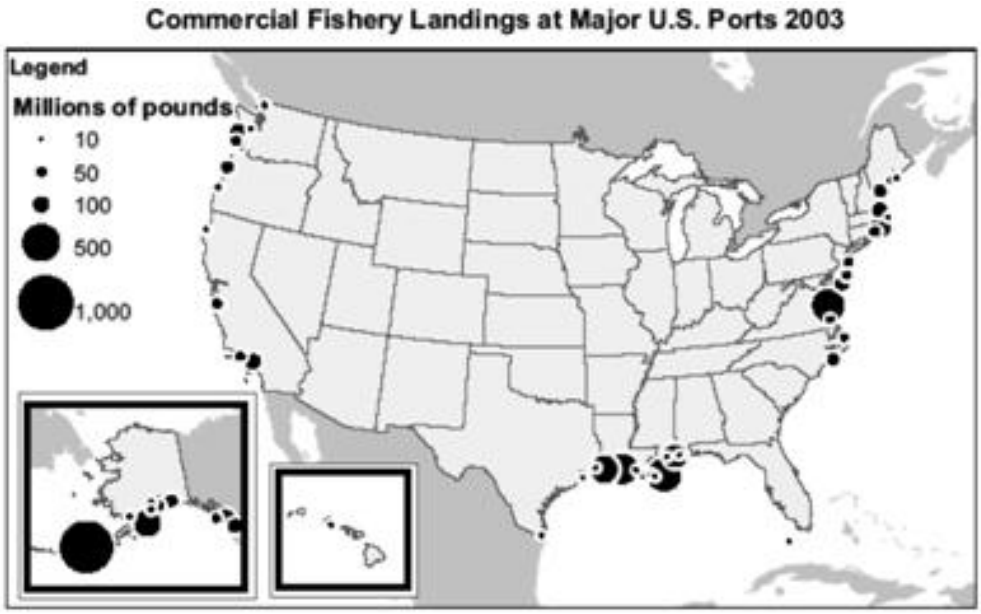
Rank	Species	Metric Tons	Rank	Species	Dollars
1	Pollock	1,532	1	Crabs	484
2	Menhaden	727	2	Shrimp	424
3	Salmon	306	3	Lobsters	308
4	Cod	269	4	Flatfish	267
5	Flatfish	202	5	Scallops	229
6	Hakes	155	6	Pollock	209
7	Crabs	154	7	Salmon	201
8	Shrimp	143	8	Cod	187
9	Herring (sea)	130	9	Clams	163
10	Sardines	73	10	Oysters	103

Commercial fisheries landings since 1950 are shown in the graphic below. Landings reached a peak of 4.8 mmt (10.5 billion pounds) in 1993 and 1994 and a value of $3.8 billion. In recent years, the values of finfish and shellfish landings have been close to equal (not shown). Alaska Pollock ranked first in landings in 2003, but 6th in value[xxii].



II. Landing sites[xxiii]

The top 50 landing places by volume are shown on the map below while volume and value are shown in the subsequent table. Certain ports are not included to preserve private information. Landings occur throughout the US, usually close to the fishing areas. As vessels have increased in speed and freezing capabilities, the relationship is less strict than in past decades. Catches of groundfish from the northeast Pacific and processed at-sea are not attributed to a specific port. The record landings in quantity was 413 thousand metric tons in 2003 and for value was $224.1 million in 1994, both in Dutch Harbor-Unalaska, Alaska.



Commercial Fishery Landings and Value at Major US Ports, 2003

Port Rank by Quantity	Quantity (Thous. MT)	Port Rank by Value	Value (USD) (Million)
Dutch Harbor-Unalaska, AK	412	New Bedford, MA	$176.20
Empire-Venice, LA	181	Dutch Harbor-Unalaska, AK	156.9
Reedville, VA	170	Kodiak, AK	81.5
Intracoastal City, LA	148	Hampton Roads Area, VA	79.6
Kodiak, AK	119	Empire-Venice, LA	50.8
Cameron, LA	117	Cape May-Wildwood, NJ	42.8
Pascagoula-Moss Point, MS	87	Homer, AK	42.7
New Bedford, MA	70	Westport, WA	42.6
Astoria, OR	52	Dulac-Chauvin, LA	42.3
Petersburg, AK	40	Honolulu, HI	41
Los Angeles, CA	40	Seward, AK	39.4
Gloucester, MA	40	Key West, FL	38.4
Ketchikan, AK	36	Gloucester, MA	37.8
Westport, WA	34	Brownsville-Port Isabel, TX	35.9
Cape May-Wildwood, NJ	34	Galveston, TX	32.7
Cordova, AK	32	Point Judith, RI	32.4
Newport, OR	32	Bayou La Batre, AL	30.8
Portland, ME	30	Cordova, AK	30.3
Beaufort-Morehead City, NC	27	Port Arthur, TX	30.1
Moss Landing, CA	20	Golden Meadow-Leeville, LA	29.1
Point Judith, RI	20	Portland, ME	28.7
Seward, AK	20	Gulfport-Biloxi, MS	26.8
Ilwaco-Chinook, WA	20	Astoria, OR	25.6
Port Hueneme-Oxnard-Ventura, CA	18	Cameron, LA	25.1
Dulac-Chauvin, LA	18	Sitka, AK	24.8
Atlantic City, NJ	17	Newport, OR	24.4
Point Pleasant, NJ	17	Reedville, VA	24.2
Sitka, AK	16	Petersburg, AK	24.1
Wanchese-Stumpy Point, NC	15	Point Pleasant, NJ	22.8
Hampton Roads Area, VA	15	Intracoastal City, LA	21.5
Rockland, ME	13	Wanchese-Stumpy Point, NC	21
Golden Meadow-Leeville, LA	12	Tampa Bay-St. Petersburg, FL	20.9
Kenai, AK	12	Atlantic City, NJ	20.8
Coos Bay-Charleston, OR	11	Stonington, ME	20.5
Bellingham, WA	11	Shelton, WA	20.1
Homer, AK	11	Bellingham, WA	19.1
Naknek-King Salmon, AK	10	Delcambre, LA	18.7
Stonington, ME	9	Ilwaco-Chinook, WA	17.3
Galveston, TX	8	Grand Isle, LA	16.9
Bayou La Batre, AL	8	Crescent City, CA	16.8
Grand Isle, LA	8	Delacroix-Yscloskey, LA	16.8
Brownsville-Port Isabel, TX	8	Los Angeles, CA	16.5
Honolulu, HI	8	Ketchikan, AK	16.4
Port Arthur, TX	8	Kenai, AK	16.3
Gulfport-Biloxi, MS	8	Coos Bay-Charleston, OR	15.9
Morgan City-Berwick, LA	8	Bay Center-South Bend, WA	15.3
Eureka, CA	7	Beaufort-Morehead City, NC	15
Key West, FL	7	Palacios, TX	14.6
Provincetown-Chatham, MA	7	Fort Myers, FL	13.8
Shelton, WA	6	Pascagoula-Moss Point, MS	13.8

III. Fishing production means

United Sates fisheries use virtually all types of fishing gears and many vessels are able to change quickly among two or more types of gear, such as scallop dredges to bottom trawls to pots. The predominant methodologies are trawling and purse seining, but many other types are important as well. Vessels that are able to freeze catches at sea include the tuna fleet, factory trawlers and crab pot vessels in Alaska, and some

shrimp trawlers in the Southeast. Catches are mostly landed fresh, at, or close to, the homeport of the vessel. Electronic navigational and fish finding equipment are generally widely used aboard the larger vessels.

IV. Main resources - Major Fisheries by Region[xxiv]

Northeast Region.

The mixed-species groundfish fishery has traditionally been the most valuable in the Northeast, followed by American lobster and Atlantic sea scallop. Principal groundfish and flounders in the Northeast, particularly cod, haddock, and yellowtail flounder, have been severely overfished, reaching record low levels in spawning stock biomass in 1993Ð94, but have been rebuilding. Dogfish and skates, which increased in abundance beginning in the 1970's as groundfish and flounders declined, comprise a substantial fraction of the fish biomass on Georges Bank.

The anadromous striped bass, driven to very low levels of abundance in the early 1980's and subjected to severe catch restrictions beginning in the mid 1980's, was declared fully restored in early 1995. The region's valuable crustaceans and bivalve mollusks, both offshore (e.g. American lobster, sea scallop, surfclam, and ocean quahog) and inshore (e.g. blue crab, oyster, blue mussel, and hard and softshell clam) are nearly all fully exploited.

Most Northeast Region fisheries are governed by Fishery Management Plans (FMPs) that are either in place or under development. Despite the goals of FMPs, overexploitation of their respective species has occurred in many cases, and efforts to rebuild have generally not yet succeeded in fully restoring depleted stocks. One example of regulations is Amendment 4 to the Sea Scallop FMP, implemented in 1994, was intended to control fishing effort by limiting the days at sea for each vessel, placing a moratorium on new entrants, and imposing a larger mesh-ring size for dredges. Some protection of scallops has been achieved by the closure, since December 1994, of portions of Georges Bank to all fishing for the protection of groundfish. Scallops have now recovered. Also,

There are 18 Federally managed stocks in the Northeast that are overfished: Gulf of Maine cod, Georges Bank cod, Gulf of Maine haddock, Georges Bank haddock, American Plaice, witch flounder, southern New England/ Mid-Atlantic yellowtail flounder, Cape Cod/Gulf of Maine yellowtail flounder, white hake, Southern New England/Mid-Atlantic windowpane flounder, Southern New England winter flounder, ocean pout, Atlantic halibut, barndoor skate, thorny skate, Atlantic salmon, bluefish, golden tilefish, black sea bass, northern monkfish, and southern monkfish. In addition, there are *3* overfished stocks in fisheries not managed under a Federal FMP: American shad, river herring, and Atlantic sturgeon. There are 26 stocks whose condition is known to be not-overfished.

Southeast Region.

The Southeast Region covers the Gulf of Mexico, the US Southeast Atlantic, and the Caribbean Sea. Important resources are Atlantic sharks, Atlantic and Gulf of Mexico coastal migratory pelagics, Atlantic and Gulf of Mexico reef fish, drum and croaker, menhaden, Southeast Atlantic and Caribbean invertebrates, highly migratory pelagic fishes, and nearshore resources

Menhaden are fully utilized. Shrimp lead in value, although they are only 10% of the catches. The three major species (brown, white, and pink) are fully utilized. About half the current shrimping effort in the Gulf could produce about the same yield. Information is incomplete on the status of invertebrates other than shrimp. Spiny lobster is overutilized. The recreational catch of spiny lobster is unknown but thought to be significant. The Caribbean spiny lobster status is uncertain, but is possibly overutilized. Stone crab appears to be fully utilized. When managed in aggregate, it is likely that some stocks will be overfished while others go underutilized. Improvements in data collection are necessary before these stocks can be assessed individually.

Overfishing of Spanish and king mackerel was detected in the 1980's. In concert with the South Atlantic and Gulf of Mexico fishery management councils, NMFS instituted restrictive regulations that include catch, size, trip, and bag limits; allocation of catch quotas between commercial and recreational fishers; and a gillnet ban in Florida state waters. In 2001, both Spanish mackerel stocks had recovered, and the Gulf of Mexico king mackerel stock was almost rebuilt. The Atlantic migratory stock of king mackerel has never been overfished,

due to proactive management. The status of other coastal migratory pelagic species in the region is unknown. Reef fish in the Southeast Region include over 200 stocks of more than 100 species. The degree of utilization and status relative to long term potential yield are unknown for many of these stocks, but several major species have been assessed. The red snapper fishery has been under stringent management measures since the late 1990's. The stock rebuilding plan provides a quota, catch limits, size limits, and commercial and recreational seasons, providing stability and predictability for industry and consumers.

The highly migratory pelagic species are important components of domestic fisheries in the Southeast and Northeast Regions, and for international fisheries elsewhere in the Atlantic. In particular, the Southeast Region includes major components of the fisheries for swordfish, marlins, sailfish and yellowfin.

Cooperative efforts among NMFS, the Councils, ?and the states, have led to the recovery of yellowtail snapper. Management of yellowtail? snapper started in 1983 with a minimum size regulation. Later measures include a 10-fish per day recreational bag limit for ?most snappers, prohibiting entanglement gear, reducing the number of fish traps, strict? commercial trip limits, and? managing commercial reef fish ?permits to stabilize effort.

There are 22 overfished stocks in the Southeast Region: red snapper, snowy grouper, Golden tilefish, red grouper, speckled hind, Warsaw grouper, black grouper, South Atlantic goliath grouper (Jewfish) and Nassau grouper, black sea bass, red porgy, Atlantic coast red drum, Gulf group King mackerel, vermilion snapper, red snapper, greater amberjack, Gulf of Mexico Nassau grouper and goliath grouper (Jewfish), Gulf of Mexico Red Drum, Puerto Rico and the US Virgin Islands Nassau Grouper and Goliath Grouper and queen conch. There are 29 stocks whose condition is known to be not-overfished.

Atlantic Highly Migratory Species.

The highly migratory pelagic species are important components of domestic fisheries in the Northeast and Southeast Regions, and for international fisheries elsewhere in the Atlantic. Marlins (blue and white) and sailfish are overfished. Overfished tunas include: bigeye (Atlantic), albacore (North Atlantic), and bluefin (West Atlantic). Overfished sharks include: bull; spinner; silky; dusky; bignose; night; Caribbean reef; tiger; lemon; sand; tiger; nurse; scalloped, great, and smooth hammerhead; and white shark. Yellowfin tuna is fully exploited and approaching an overfished condition.

North Atlantic swordfish has improved, likely due to strong recruitment since 1997, combined with recent reductions in catches, especially compared to the peak catch values of 1987. The large numbers of recruiting fish in the late 1990s are contributing to increases in biomass that should result in further improvement.

Alaska Region.

The Alaska Region dominates in the tonnage of US fisheries resources that could be obtained in the long term. Major resources are Pacific salmon, groundfish, Pacific halibut, shellfish, and herring. Catches are substantially below the long-term potential because many resources, particularly flatfish, are underutilized. Alaska′s salmon species (chinook, coho, sockeye, pink, and chum) have generally produced bumper harvests recently, although some stocks are down. The development of domestic groundfish fisheries off Alaska has been a great success. Until 1977, Alaska′s groundfish fisheries, except for Pacific halibut, were dominated by foreign fishing. Then, within a few years under the new management regime, the US fishery largely replaced the foreign fleets. Since 2001, vessels in the Bering Sea/Aleutian Islands crab fishery have been limited to those meeting historical harvest qualifications. A second stage includes a crab license buyback program. There are 2 overfished stocks in the Alaska Region - Bering Sea Snow Crab and Pribilof Islands Blue King Crab.

Pacific Coast Region.

The major Pacific Coast species are Pacific salmon, coastal pelagic fishes, groundfish, Pacific halibut, and nearshore resources. There is underutilization of some species and also low abundance of others. Most stocks, including all five salmon species, are either fully or over utilized. Depressed salmon production is partly due to generally unfavorable ocean conditions off the Pacific Coast since the late 1970′s and other

factors such as habitat degradation. Some stocks are depleted. NMFS has listed 26 West Coast salmon populations as endangered or threatened under the Endangered Species Act. Salmon recovery will take many years and requires the cooperative efforts of Federal, state, local, tribal, and private entities. Coastal pelagic fishes typically fluctuate widely in abundance, and most stocks are low in abundance relative to historical levels and are fully utilized. The Pacific sardine population has been increasing after decades of low abundance. Jack mackerel and northern anchovy are underutilized.

The groundfish fishery harvests a vast array of bottom-dwelling species from Washington to California. Some are overexploited, some have experienced periods of low recruitment, and some are underutilized. Pacific whiting dominates the commercial groundfish catch. Rockfishes and lingcod also support popular recreational fisheries. Certain stocks, such as Pacific ocean perch, need to be rebuilt following overutilization and a period of poor recruitment. Shortbelly rockfish is underutilized because of a lack of market. Many rockfish species live a long time (in some cases up to 80 years or more) and may take many years to mature and reproduce, making stock recovery even more challenging. NMFS works in partnership with the industry, universities, and state, local, and tribal agencies to collect basic scientific data about the species. Also, there are observers on fishing vessels, transmitting real-time data electronically to NMFS.

Pacific Coast shellfish resources are diverse and important. Shrimp, crab, clam, and abalone fisheries are relatively small in tonnage, but contribute substantially to fisheries value due to the high prices they command. Most shellfish species are fully utilized. Recreational fisheries are important, especially in southern California. A wide variety of species is taken, and the recreational catch of some greatly exceeds the commercial catch. Many are nearshore resources. Gamefishes such as albacore, billfishes, rockfish, and salmon are highly prized. Recreational crabbing, clam digging, and abalone diving activities are also significant.

There are 8 stocks overfished (all are groundfish) in the Pacific Region - lingcod, Pacific ocean perch, bocaccio, canary rockfish, darkblotched rockfish, widow rockfish, cowcod and yelloweye rockfish. Because many of these stocks are long-lived and slow to reproduce, they cannot support aggressive harvest rates. Similarly, once these stocks are overfished, they are slow to rebuild. Rebuilding plans for overfished Pacific coast groundfish species of canary rockfish, darkblotched rockfish, lingcod, and Pacific ocean perch were approved in January, 2004. Additionally, NMFS announced in April, 2004 that Pacific whiting will no longer be considered overfished. The remaining stocks are being managed under interim rebuilding measures or default rebuilding policies while species-specific plans are formalized. Reductions in the harvest and bycatch have enabled these stocks to begin rebuilding. For example, the most recent lingcod assessment shows a recent increase in spawning biomass.

Western Pacific Region.

This region stretches across the central and western Pacific and includes the Hawaiian Islands and the US-affiliated islands of American Samoa, Guam, and the Northern Marianas. These are tropical and subtropical island waters with a large diversity of species but low sustainable yields due to limited ocean nutrients. Though the magnitude of the fisheries is small compared to some mainland fisheries, they are valued highly and are important culturally and socially in Hawaii and the Pacific islands. Also, certain transboundary fisheries hold international interest, with high collective importance to Pacific Rim nations and US fleets fishing within and beyond the EEZ. Fishery resources include highly migratory pelagic fishes, bottomfishes, nearshore reef fishes, and invertebrates.

The highly migratory stocks (tunas, billfishes, swordfish, sharks, and others) range the high seas, often beyond US fisheries jurisdiction. Tunas are the major catch component and migrate across multiple jurisdictions. Together, these stocks account for 99% of the region's catches and support some of the most valuable fisheries in the world. In the Hawaii-based pelagic long line fishery for billfish and tuna, observers aboard the vessels monitor the interaction with protected species such as loggerhead, leatherback and green sea turtles, and albatross. This is expected to reduce their incidental bycatch through new management measures.

Western Pacific bottomfishes (snappers, jacks, grouper, emperors) are harvested from a variety of rock and coral habitats around Hawaii and western Pacific islands. About 90% of the catch is taken in the Main

Hawaiian Islands, where stock assessments indicate some important species are only at 10Ð30% of original stock levels in some areas. However, stocks in the Northwestern Hawaiian Islands, American Samoa, and the Mariana Islands are underutilized. Pelagic armorhead was harvested from 1968 to the late 1980's or early 1990's by foreign fleets on the summits and slopes of submerged seamounts along the southern Emperor-northern Hawaiian Ridge. Of these undersea mountains, the only group under US jurisdiction is the Hancock Seamounts (representing less than 5% of the total fishing grounds). Fishing there has been prohibited since 1984, to allow the stock to recover after foreign catch rates declined to low levels. The US has never fished pelagic armorhead, but because of its fishery potential, the resource is regulated under a Seamount Groundfish FMP.

The most important invertebrate fisheries in the Western Pacific Region are for spiny and slipper lobsters, primarily in the Northwestern Hawaiian Islands. This fishery began in 1977 and reached its peak during the mid 1980's, but it has since declined. The primary cause is thought to be a general reduction in lobster productivity and recruitment since 1989, stemming from oceanographic changes. Since 1991, a limited entry and harvest guideline regulatory regime has been implemented, which has allowed some recovery.

Pelagic armorhead is the only overfished stock in the Pacific Islands Region.

Nearshore Resources.

Nearshore fishery resources are coastal and estuarine species under the control of coastal states and their local governments for which NMFS does not have direct responsibility. Many of these species provide the basis for locally important commercial and recreational fisheries. They vary widely in species diversity and abundance. Many are highly prized gamefish. Others are small fishes used for bait, food, and industrial products. Those of greatest interest include invertebrate species like crabs, shrimps, abalones, clams, scallops, and oysters. Because it is difficult to assess the condition of many of the Nation's nearshore resources, a high percentage are of unknown status. No firm estimates exist for long term potential yield. Because the composition of nearshore resources is diverse and management is spread out among the many coastal states and other local authorities, a comprehensive treatment of them has not been attempted.

Traditional techniques are usually employed in nearshore resource conservation. These include size limits, catch limits, method restrictions, and area and time closures. Nearly all fisheries are covered by licensing requirements and these often prohibit non-residents from participating in the fisheries or require them to pay higher license fees. Usually, sales and landings must be reported to local conservation agencies and to taxing authorities.

V. Management applied to main fisheries

Concern for the sustainability of fish resources was evident as early as 1871, when Congress wrote that Ò... the most valuable food fishes of the coast and the lakes of the US are rapidly diminishing in number, to the public injury, and so as materially to affect the interests of trade and commerce....Ó However, it was not until 1976, with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), that the Federal government began actively managing fisheries from 3 to 200 miles off the coast for most species and beyond 200 miles for anadromous species such as salmon. Prior to the MFCMA, the Federal fisheries role mostly consisted of research, exploratory fishing, gear development, financial assistance, voluntary seafood inspection programs, and participation in international agreements and treaties.

In recent years, NOAA's vision for increasing the Nation's wealth includes maintaining fishery resources over time to provide Americans with both commercial and recreational fishing opportunities and a safe supply of high quality seafood. This vision incorporates both biological and economic sustainability: stock levels maintained at biologically healthy levels; optimal harvest of fish over time, using the least-cost levels of capital, labor, and other resources; and equitable allocation of the harvest between user groups[xxv].

In partnership with the regional fishery management councils, NMFS is working to prevent overfishing and restore overfished stocks. The NMFS objectives are to reduce fishing intensity, monitor the fisheries, and implement measures to reduce bycatch and protect essential fish habitat. NMFS is establishing marine protected areas and individual fishing quotas, reducing fishing capacity, and implementing ecosystem-based fishery management. Recent initiatives include streamlining regulatory operations, implementing the

recommendations of independent review bodies, and expanding research[xxvi].

Significant progress has been made in recent years. During 2003, four stocks were declared fully rebuilt - Georges Bank winter flounder in the Northeast, Atlantic blacktip shark, and South Atlantic and Gulf of Mexico stocks of yellowtail snapper. There are now 31 stocks for which overfishing has been stopped, while 14 have been newly listed as overfished, representing a net gain of 17 stocks not overfished. At the end of 2003, 60 stocks were overfished and 232 were not. A net gain of 13 stocks that are fully rebuilt has been made. The number of stocks for which harvest rates are unknown or for which overfishing thresholds are not defined decreased from 658 in 2002 to 617 in 2003. Most of these stocks do not have significant harvests, and are not assessed as a matter of priorities for research funds, particularly if their assessment is difficult and there is no evidence they are in jeopardy. Rebuilding programs are in place or under development for virtually all overfished stocks, and have largely resulted in the gains. Among the 267 major stocks, 40 are overfished, 147 are not, and for the remaining 80, the overfishing status is not known or is not defined. Among the 642 minor stocks, 20 are overfished, 85 are not, and for the remaining 537, the overfishing status is not known or is not defined. A ÒmajorÓ stock is a stock that has 200,000 pounds (91,000 kg.) or more of landings in 2001 **[xxvii]**.

In a study of Federal investment in the fishery sector, virtually all aspects of US tax, fisheries, and societal policies were examined to see whether they created subsidies for the fishing industry and whether these subsidies had impacts. The study determined that the US influences capitalization to a lesser degree than some other fishing nations. For the last several decades, Federal assistance has markedly declined and remnant programs have become much more focused. The more significant programs were those that allow deferral of income taxes to be used on vessel improvement, buyback programs that retire excess capacity, and a loan guarantee program that permits a few vessels to have longer loan terms than are otherwise available. These programs have very little impact on adding additional fishing capacity or making US fisheries commodities more competitive in the world market. The gross value of direct US subsidies was cited as $25 million, or slightly more than 0.5% of the gross ex-vessel value of commercial landings. There are no major ship construction subsidies, market development and other forms of assistance that are readily apparent in developed and developing fishing industries around the world. The report is available at http://www.nmfs.noaa.gov/sfa/ITF.html[xxviii].

3. Inland sub-sector

I. Catch profile

Fisheries in US inland waters US are small compared to marine fisheries. The largest components of the inland fisheries are the landings from the Great Lakes and from the Mississippi River basin. Great Lakes landings were worth about $13 million in 2003, with a total weight about 8,000 mt. [xxix]A similar amount has been found to be obtained from the Mississippi in prior comparisons[xxx]. This is less than 1% of the volume and dollar value of US fisheries.

II. Landing sites

Freshwater production is landed near where it is caught, primarily in the Great Lakes Region, which contains about 90% of the freshwater volume of the US and along the Mississippi River. There are no large centers of landings. The landings of the 50th ranked marine port are about equal to that of the whole Great Lakes Region.

III. Fishing production means

Fisheries in US inland waters use many of the same types of gear as the marine fisheries, but everything is on a much smaller scale. There is no predominant method, but among the more significant are trawls, gill nets, weirs, traps, and hook and line.

IV. Main resources

The largest components of the inland fisheries are the landings from the Great Lakes and from the Mississippi River basin. Inland fisheries are usually managed by the various states amid conflicting pressures for allocations among the recreational and commercial interests as well as concerns from environmental groups. In many areas, there are also concerns over water quality and thus there is constant monitoring of the various species for their uptake of contaminants. There is also an important impact from invasive species that have taken over certain ecological niches and caused considerable damage to fisheries of all types.

The Great Lakes represent the largest liquid reservoir of fresh water on the planet with a combined surface area of 245,000 square kilometers. Fisheries in the Great Lakes are managed by the US States and a Canadian province under coordination of the Great Lakes Fishery Commission. The Commission was established through the Convention on Great Lakes Fisheries between Canada and the US in 1955. The status and trends of fish species in the Great Lakes varies by lake. In general, though, the population of the predatory sea lamprey is under control, lake trout are being restored successfully, and the various species of white fish are at high levels. Introduced species of trout and salmon support stable fisheries and in some areas there is natural reproduction. Most of the landings and the economic benefits come from recreational fishing. Commercial fishing in US waters of the Great Lakes is highly restricted. **[xxxi]**

The Mississippi River is the world's third largest river system. It is the longest and largest in North America flowing 3,705 km with a river basin of 4.76 million square kilometers covering about 40 percent of the US. The river has great habitat diversity and biological productivity. The individual states within the Mississippi watershed manage the recreational and commercial fisheries. Federal involvement is limited to research, protection of endangered and threatened species, and coordination. There is no standard system of statistics for landings.

The river faces many of the same problems as other inland waters: pollution stresses, engineering works, and the introduction of non - native species. In the upper river, four groups of fish dominate the commercial catch: carp, buffalo, catfishes, and drum, comprising nearly 100 percent of the commercial value of landings. Carp is consistently the leading species. In the same area, the principal recreational species are bluegill and crappie. Lakes on the headwaters are only fished recreationally, for such species as walleye, northern pike, muskellunge, and basses. The commercial harvest has not changed greatly in the last century, at about 5,000 t, but carp has risen to nearly half the average total annual harvest since its introduction in the late 1800's. Navigation dams erected in the upper river have caused a decline in fishes that inhabit swift-current habitats. Such species have not declined in the dam-free lower river. In the lower river, carp makes up about 30 percent of the total harvest with Buffalo fish second at about 20%[xxxii].

V. Management applied to main fisheries

Inland fisheries within states or tribal lands, are managed by the states or tribes amid conflicting pressures for allocations among the recreational and commercial interests as well as concerns from environmental groups. In many areas, there are also concerns over water quality and thus there is constant monitoring of contaminants in the various species. There is also an important impact from invasive species that have taken over certain ecological niches and caused damage to fisheries of all types. These include, for example, zebra mussels which have damaged or out-competed many sessile species in major parts of the US, as well as sea lampreys, now under control at considerable cost, that have decimated several species, particularly lake trout in the Great Lakes. More recently, Asian carp that escaped from the aquaculture facilities have been making their way northward up the Mississippi River and are poised to invade the Great Lakes. So far, they are being kept out by an electrical barrier. Management techniques include closed seasons and areas, size and quantity limits, and license restrictions.

Fisheries in the Great Lakes are managed by the US Great Lakes states and the Canadian province of Ontario under coordination of the Great Lakes Fishery Commission. The Commission coordinates fisheries research and recommends measures to achieve maximum sustained productivity of fish stocks; and works to eradicate or minimize sea lampreys. Additional information about the Commission is available at its Web site: http://www.glfc.org/. Commercial fisheries production statistics for the Great Lakes from 1867 - 2000 are available

at: http://www.glfc.org/databases/commercial/commerc.asp.

The Biological Resources Discipline (http://biology.usgs.gov/) of the US Geological Survey assists states, tribes, and the Commission in fisheries science and the US Fish and Wildlife Service (http://www.fws.gov/) assists with a system of hatcheries. Both agencies are part of the Interior Department.

4. The US Recreational sub-sector

Fishing is the fourth most common recreational choice in the US [xxxiii]It is not surprising that the recreational fishing sector in the US is very large. Using data from the 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation conducted every five years by the U. S. Bureau of the Census, (available at http://fa.r9.fws.gov/surveys/surveys.html), the American Sportfishing Association reports that the estimated number of US recreational anglers is 44 million, more people fish than play golf or tennis combined, the states with the most anglers are California, Florida and Texas, and the economic impact of recreational fishing is about $116 billion http://www.asafishing.org/asa/statistics/[xxxiv]. The economic activity associated with it includes not only the fishing gear and boats used (70% of all boats sold are used in fishing and fishing at $1.4 billion/year is the second largest value category of sports equipment [xxxv]), but also expenses such as for transportation, meals, and hotels.

While value is clearly important, the catch is also significant. In most inland fisheries and even in several marine fisheries, recreational anglers harvest as much or more fish than commercial fishermen. Some of these marine fisheries with high sport harvest include bluefish, red drum, striped bass, king mackerel, spotted seatrout, and sheephead. Recreational fisheries for species such as Atlantic cod, winter flounder, Atlantic mackerel, striped bass, bluefish, and bluefin tuna are also important to the Northeast region's economy. The same (for other species) is true in all regions. The total sport harvest of all marine finfish combined in 2003 from US coasts excluding Texas and Alaska but including Hawaii and Puerto Rico was over 207 million fish weighing about 270 million pounds during 82 million fishing trips. In addition to the harvest, sport anglers caught and released alive about 248 million fish in 2003. The NMFS Marine Recreational Fisheries Statistics Program is used to monitor the marine recreational catch in most fisheries and areas. It provides essential marine recreational fisheries information to government, scientists, and the public. The Program develops the numbers and weight of fish harvested recreationally, the size composition of the catch, the numbers of fishers, the number of trips they make, and the social and economic information about the participants. These data are used to: establish regulations to control fishing mortality, allocate fishery resources among competing user groups, and assess the impacts of regulations on anglers and the sport fishing industry. More information about the Program is available at: http://www.st.nmfs.gov/st1/recreational/the_mrfss.html.

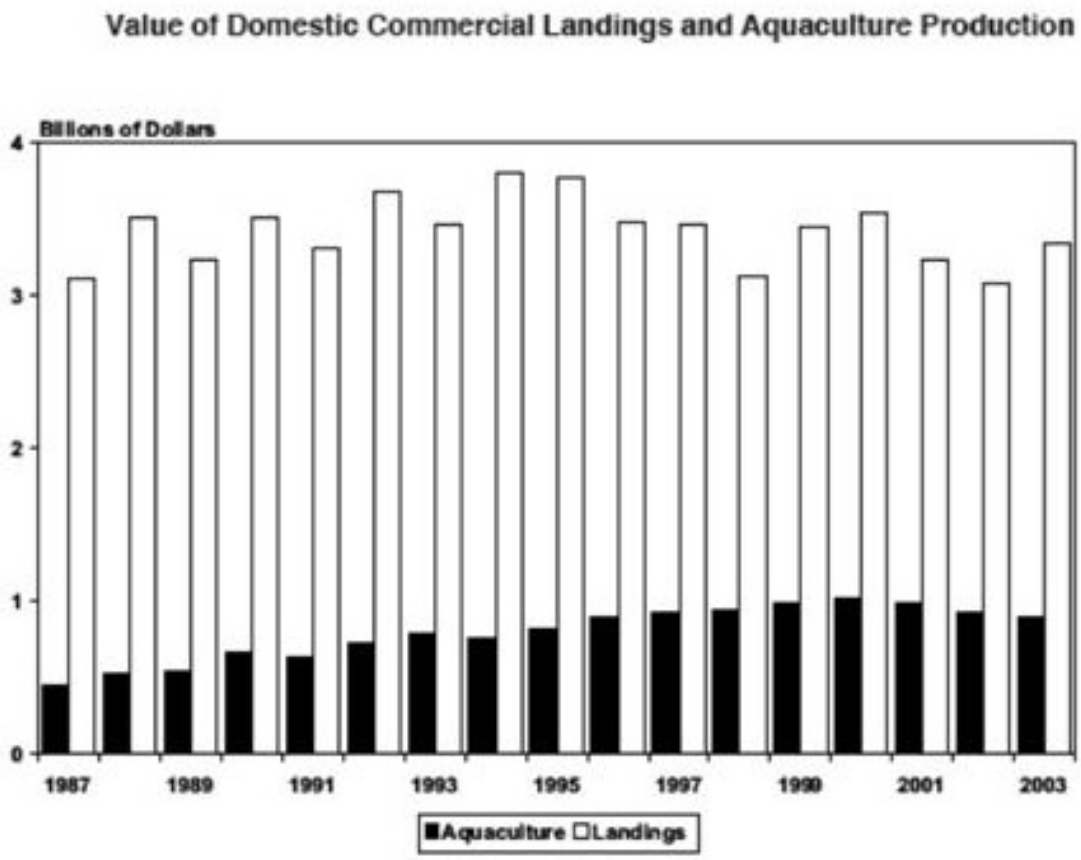
Commercial and recreational fishing are very closely related even though they are often considered to be mutually exclusive. Both sectors are often in competition for the same species, they each are working on a renewable resource, and the support services such as piers, equipment, ice, fuel and bait may be provided by the same firms. Both sectors have immense political influence such that regulatory actions that would reduce catches, add an economic burden, or allocate resources between the two groups can often quickly become very contentious. As for other fishery sectors, management techniques include closed seasons and areas, size and quantity limits, and restrictions on the number of licenses.

5. The US aquaculture sub-sector

The development of a robust aquaculture industry has the most potential to fill the seafood needs of the domestic market by reducing imports and benefiting the nation's balance of trade. Aquaculture aimed at stock enhancement also has associated economic benefits, such as increased employment associated with the enhancement effort, and the continued health of the commercial fishing and recreational fisheries industries. In addition, aquaculture technologies and consulting services for private industry and enhancement efforts, as well as superior, disease-free strains of broodstock are valuable exports that contribute to the US economy.

I. Catch profile

The aquaculture sector has seen a weakening in value in recent years due to competition with imports and wild fisheries, and perhaps some unfavorable press regarding contaminants Ð whether or not they have been attributable to the US production. Nevertheless, the production trendline has remained mostly positive [xxxvi].



II. Production means, landing sites, and main resources

US aquaculture produces food fish, ornamental fish, baitfish, mollusks, crustaceans, aquatic plants and algae, and some reptiles such as alligators and turtles. These are grown in a wide variety of climates with either fresh or salt water in diverse production systems. Catfish production is the largest sector in the US aquaculture industry, concentrated in Mississippi, Alabama, Arkansas, and Louisiana. Catfish are grown in open freshwater ponds, with the total area encompassing about 180,000 acres (730 sq. km.) [xxxvii].

Other major foodfish grown in the US are trout, salmon, tilapia, hybrid striped bass, sturgeon, walleye, and yellow perch. With the exception of salmon, these fish are normally grown in open freshwater production systems. Salmon are somewhat different than other species, as they are hatched in freshwater and then later transferred to saltwater net-pens for final growout. Aside from fish, US aquaculture also produces freshwater crawfish, mainly in Louisiana, and shrimp in brackish ponds in South Carolina, Texas, and Hawaii. The US also farm-raises mollusk species such as abalone, oysters, clams, and mussels. Mollusks are grown in almost every coastal area of the US and are produced using various systems[xxxviii].

Baitfish are produced in freshwater ponds, with Arkansas the largest producer. Ornamental fish production covers a large number of species and a variety of growing environments, including freshwater, saltwater, cold water, and warm water. Additional farmed species include alligators (mostly in Florida and Louisiana), turtles, aquatic plants, and algae. Aquatic plants include edible varieties or plants for use in wetland restoration projects. The best-known algae production in the US is spirulina, which is used as an additive in health foods

and also as a feed for pets and ornamental fish[xxxix].

Over the last decade there has been slow but nearly continuous growth in domestic aquaculture production and strong growth in the amount of aquaculture products imported into the US. Probably the chief reason has been the decline in prices for both domestically produced and imported products. The domestic aquaculture industry is expected to face continuing strong competition from imports and from the domestic poultry and livestock industries.[xl].

V. Management applied to main fisheries

Three US government departments, Agriculture (USDA), Commerce (DOC), and Interior (USDI) and several of their agencies share aquaculture responsibilities. Their work is coordinated through the Joint Subcommittee on Aquaculture (JSA). USDA focuses on freshwater species but provides general support to all farming businesses. USDI focuses on freshwater species particularly in operating a national system of hatcheries and in assisting American Indian tribal aquaculture. DOC focuses on marine species and working with the fishery management councils, regulates the development of aquaculture in the EEZ.

There is no single Federal agency for assistance to, nor regulation of, the aquaculture industry in the US. Each facet comes under the jurisdiction of an appropriate authority, such as seafood inspection, environmental protection, food safety, technology or research assistance, licensing, and taxation, just as would other sectors of the US economy.

Rome Articles 38-47, namely:

- The US Department Of Agriculture (USDA) has several important programs to assist the aquaculture industry. Details and reports for each of the following are available from the USDA website at http://www.usda.gov by navigating to /Agriculture/Aquaculture.

  - The Animal, and Plant Health Inspection Service (APHIS) conducts monitoring and eradication of infectious diseases, provides compensation for infected animals that must be destroyed, provides relocation and control of predatory birds such as cormorants and pelicans and river otters, and can certify an area free of disease if necessary for an international shipment. APHIS also approves diagnostic laboratories, negotiates with foreign countries to ensure zoo sanitary regulations are scientifically based, and regulates the production and sale of biologic reagents for use in all aquatic animals.

  - The Economics Research Service (ERS) publishes comprehensive market reports.

  - The Agricultural Research Service (ARS) conducts aquaculture research: for example, ARS recently developed a vaccine against Streptococcus iniae, a bacterial pathogen in cultivated tilapia, hybrid striped bass, rainbow trout, yellowtail, eel, and turbot and 16 other cultured and wild species, causing $150 million a year in losses worldwide. The ARS program includes: genetic improvement, integrated aquatic animal health management, reproduction and early development, growth, development, and nutrition, production systems, sustainability and environmental compatibility, of aquaculture, product quality and safety, and information and technology transfer.

  - The Research, Education, and Extension Service (CSREES) assists aquaculture firms in partnership with the states through its regional extension services.

  - The Regional Aquaculture Centers encourage collaborative research and extension education programs in aquaculture programs provided by USDA and other institutions.

- The US Department of Commerce (DOC) has a plan and objectives similar to those of USDI and USDA, but more specific. Working in partnership with all parts of government and all stakeholders,

DOC will create a business climate and technological base for industry to develop environmentally sound aquaculture. The specific, quantitative objectives by the year 2025 are available at http://www.nmfs.noaa.gov/trade/DOCAQpolicy.htm[xli]. NOAA is the major DOC element with responsibilities for aquaculture through programs in NMFS, the National Sea Grant College Program and the National Ocean Service[xlii]. NOAA objectives include: (1) minimization of environmental impacts and development of standards; (2) development of cost-effective, environmentally sound aquaculture and hatchery technology; (3) growth and production of marine species throughout their life cycle; (4) biotechnology to provide improved strains, sterile animals, detection of pathogens, and development of vaccines and other measures for controlling disease and parasites; (5) technology transfer to industry and government partners; and (6) coordination with management agencies to identify areas appropriate for aquaculture facilities and develop more efficient permitting procedures.

a. **NMFS** activities include: research on biology and reproduction, habitat utilization and restoration, environmental impact assessment, and fish pathology. Much of the information developed has been used both in the commercial sector where it has been instrumental in the development of the farmed salmon industry, as well as shellfish hatcheries and shrimp culture operations throughout the world. Work is also conducted on rearing threatened and protected species for stock recovery. For example, the Milford Laboratory aquaculture program includes studies of the culture of fish and shellfish to develop methods suitable for commercial use as well as for stock enhancement and restoration. State/Federal and industry grant programs have recently included funding for various types of commercial aquaculture and salmon enhancement projects. For example, some have been aimed at creating opportunities for displaced New England fishermen. Additionally, NMFS has authority to guarantee aquaculture loans, facilitating financing for qualified applicants. On the regulatory front, the Fisheries Management Councils are becoming involved in the decision-making process for offshore aquaculture permits, including experimental scallop culture off the coast of Massachusetts, and an experimental permit for red snapper culture in the Gulf of Mexico. NMFS aquaculture goals are:

- Develop a comprehensive understanding of marine aquaculture economics and related environmental issues to support decision-making,

- Develop offshore aquaculture legislation that will establish regulations for offshore aquaculture that includes a streamlined permitting process, siting criteria, and pre-approved zones,

- Develop and improve marine species culturing systems for commercial and enhancement purposes,

- Contribute to public understanding of NOAA's aquaculture program by providing access to information on aquaculture research and industry issues.

b. **The National Sea Grant College Program** (http://www.seagrant.noaa.gov/) supports aquaculture in many areas including development of offshore and recirculating marine systems, hormonal control of growth and reproduction, growout technology, feeds and nutrition, disease control, regulation, marketing, food processing, and environmental technologies to meet water quality standards. Aquaculture related projects account for approximately $10 million direct and matching Sea Grant funds on an annual basis. Sea Grant supports aquaculture activities in research, education, and technology transfer. Sea Grant research has contributed to the creation of several new industries including Gulf of Mexico and South Atlantic soft shell crab, Pacific Northwest oyster and clam, hybrid striped bass, and Mid-Atlantic hard clam. Sea Grant research and outreach has helped to establish scores of new businesses, and to provide improved technologies to these businesses. The combined impact of Sea Grant-developed technology amounts to at least $100 million annually and supports thousands of US jobs. Sea Grant has also collaborated extensively internationally, creating opportunities for aquaculture technology exchange with Japan, China, Israel, France,

Russia and Ireland.

c. **National Ocean Service (**http://oceanservice.noaa.gov/**).** States can use Federal Coastal Zone Management Act funds for: (1) the adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone; (2) to formulate, administer, and implement strategic plans for marine aquaculture; and (3) to develop a coordinated process among State agencies to regulate and issue permits for aquaculture facilities in the coastal zone. Projects have included: development of aquaculture net-pen guidelines; impact of aquaculture on the eutrophication of coastal bays; revision of aquaculture lease rules; development of a marine aquaculture management plan and geographic information system; and development and implementation of a marine aquaculture regulatory and leasing program.

- The US Department of Interior (USDI) has two major aquaculture programs:

a. The Fish and Wildlife Service operates the National Fish Hatchery System (http://fisheries.fws.gov/FWSFH/NFHSintro.htm) through 70 hatcheries to carry out fishery conservation. Nine Fish Health Centers and seven Fish Technology Centers provide support to the network of hatcheries. These facilities serve fisheries that have been seriously impacted by habitat alterations and by overuse. About 78 percent of the production of the NFHS is used in the restoration and mitigation of nationally significant fish species. For example, over the past 8 years, fish hatcheries stocked over 50 million Atlantic salmon in New England waters to aid in their restoration. Also, production and stocking of lake trout into the Great Lakes continues to be a highly successful, high priority program. Fish Technology Centers (http://fisheries.fws.gov/ftc/) provide direct technical support to the Hatchery System and also provide technical assistance and fish culture technology to state hatcheries, the aquaculture industry, and to other organizations and individuals engaged in raising fish. The Centers conserve the genetic integrity of fish stocks with emphasis on native fishes, evaluate the interactions between cultured fish and wild stocks, develop fish culture and transport techniques to assist the recovery of endangered fishes, and improve the effectiveness of drugs and chemicals in reducing fish diseases. Fish Health Centers (http://fisheries.fws.gov/FHC) work cooperatively with fish hatcheries, Tribes, states, and other Federal agencies to detect, identify, document, and control fish pathogens and diseases. The Centers are expanding their roles in recovering endangered species by providing diagnostic services and expertise and by developing non-lethal methods for fish health sampling and monitoring of endangered species.

b. The US Geological Survey (USGS Ð http://www.usgs.gov) provides fisheries research and technical assistance through a system of 18 Science Centers with associated field stations, and 40 Cooperative Research Units. Support is available to Federal, state, and tribal communities in a wide range of areas with direct and indirect support to aquaculture. USGS scientists provide expertise in aquatic organism health; disease detection, diagnostics and treatment; genetic characterization of pathogens and aquatic organisms; the physiology and behavior of cultured fishes; identification and assessment of introduced and nuisance species; and toxicology research. Major activities related to aquaculture are found at the following Science Centers with specialized fisheries and aquatic sciences capabilities:

- The Upper Midwest Environmental Science Center (http://www.umesc.usgs.gov) conducts research on new medicinal drugs for aquaculture and to support the approvals or registrations of drugs and chemicals for use in public fish husbandry and management.

- The Leetown Science Center (http://www.lsc.usgs.gov/) develops methods for isolation, detection and identification of pathogens for disease control.

- The Western Fisheries Research Center (http://wfrc.usgs.gov/) conducts research on infectious diseases, the physiology and etiology of disease, and implications for culture.

- **The Florida Integrated Science Centers** (http://fisc.er.usgs.gov/) studies the impacts of non-indigenous species on cultured and native aquatic species to provide information for listing of introduced species as aquatic nuisance species.

- The Columbia Environmental Research Center (http://www.cerc.cr.usgs.gov/) conducts toxicology and chemistry studies to detect and evaluate the effects of contaminants on the quality of the aquatic environment and aquatic species.

- **Cooperative Research Units** (https://www.coopunits.org). The 40 research units, located in 38 states, are partnerships among the USGS, a State agency, a host university, and the Wildlife Management Institute. CRUs conduct research; help educate graduate students and natural resource professionals; and provide technical assistance.

IV. Post harvest use

About 73 percent of US landings are used for fresh and frozen human food (e.g., fish fillets, steaks, sticks, and portions, breaded shrimp, and surimi) and 4% for fresh and frozen bait and animal food. Five % are canned for human food (e.g., salmon, sardines, tuna, and clams) and less than 1 percent is canned for bait and animal food. One % is cured for human food and 17 percent is reduced to meal, oil, and other products [xliii].

The processing and wholesale sectors transform fishery products and deliver them to the final consumers. The primary processing sector includes firms that purchase the raw product from harvesters or importers and transform it into a final product or deliver intermediate products to the final producers; the primary wholesaling sector refers to those firms involved in an initial phase of distribution of the product, delivering products to processors or secondary wholesalers. The secondary wholesaling sector covers those firms that distribute the final processed products to the retail sector. As in the harvest sector, technological developments advanced the processing and distribution of seafood. Cold storage and freezing plants used to store excess harvests were established as early as 1892 and expanded throughout the 20th century. The first distant-water cold storage plant was built in Costa Rica in 1936, allowing US vessels to offload fish far from domestic ports. The canning process developed in France in the early 1800's found a ready use by 1878 in Alaska salmon fisheries and by 1900 in California's tuna fishery. Efficient methods for filleting and packaging fish were introduced during the early 1920's and continue to advance. Today the sector is a multi-billion - dollar industry.

The processing sector is dependent on the harvest sector, and is subject to the seasonal variation inherent in most fisheries. Many firms compensate by diversifying, processing more than one species or product, but may still cease production for parts of the year. Others just operate seasonally. A benefit of management plans that smooth harvesting patterns, is the ability for processing firms to smooth their production and delivery of fresh, high quality products, and to provide stable employment.

NOAA's National Seafood Inspection Laboratory (NSIL) was originally created to directly support the fishing industry through development of new processing technologies. Over time, this mission has shifted to focus more support on the Seafood Inspection Program as well as to assist the agency in its fisheries management responsibilities. NSIL provides analytical laboratory, data management, Regulatory Compliance Risk Analysis, and Information Transfer expertise to meet NOAA's fishery management and seafood safety responsibilities. More information is available at: http://www.nmfs.noaa.gov/sfa/sfweb/nsil/index.htm

Seafood safety is an important issue facing the processing sector. Seafood processing is unique among food services because a wide range of species and products are handled, each with its own contamination and spoilage risks. Fish and shellfish contamination can arise from: bacteria and viruses from harvest waters, naturally occurring marine toxins; chemicals and elements in the water (i.e. mercury, lead, cadmium, PCB's, dioxins, and pesticides), and improper handling. In addition, establishment and enforcement of seafood safety standards are complicated by the wide variety of harvesting, handling, and processing methods.

Seafood processing safety is jointly overseen by the FDA, the Environmental Protection Agency (EPA), and NMFS. Regulation relies on mandatory, but periodic, inspections of seafood plants (by FDA) and on voluntary inspection and certification services (by NMFS). The inspection and certification services provided by NMFS include not only evaluation of safety of both the process and product, but also evaluations of wholesomeness, labeling, and quality. Firms that meet established requirements may affix applicable official Federal inspection marks to the product. Infrequent visual inspection is inadequate for seafood because most contamination common to seafood cannot be detected this way. Therefore, the FDA and NMFS have implemented new methods for regulating the processing and wholesaling of seafood, collectively called HACCP, for Hazard Analysis of Critical Control Points. HACCP is a risk assessment system that identifies and regulates critical points of the production process prone to contamination or spoilage. Under this program, domestic processors, distributors (packers, repackers, wholesalers, and warehouses), importers (and therefore foreign processors shipping to the US), and at-sea processors are required to develop and implement HACCP plans. Under the NMFS Seafood Inspection Program (http://seafood.nmfs.noaa.gov/), 1,000 seafood processors, distributors, retailers, importers, and exporters participate voluntarily in various services related to sanitation, product inspection and seafood evaluation. The Program will inspect and certify US products to demonstrate that they are in compliance with importing country requirements and buyers specifications. In addition to domestic activities, the Program will conduct verification audits in foreign countries to enable foreign processors to demonstrate to US importers that their processing controls meet the requirements of the FDA HACCP regulation for fish and fishery products.

V. Fishery sector performance

1. Economic role of fisheries in the national economy

In the US as a whole, fisheries are less than one percent of the economic activity, but in many coastal areas, fisheries constitute a major, or even the principal economic base. Even in major cities such as Boston, Seattle, and San Diego, it is easy to see from a quick tour of the waterfront the major impact that fishing has on the local economy. In some cases, one can see what appears to be endless marinas filled with expensive sport fishing boats and in others there are wharfs upon wharfs of small and large commercial fishing craft ranging from a few meters long to over 100. In many coastal cities, such as New Bedford, Kodiak, and Brownsville, one can quickly grasp that the local economy revolves around the fishing industry.

The commercial fishing industry contributes about $31.5 billion (2003) in value added to the US GDP. Per FAO, it was the fourth largest in the world in 2002. Recreational fisheries contributed an additional $12 billion. Aquaculture production grew from $45 million worth of products in 1974 to about $866 million in 2002) [xliv].

2. Demand

US consumption of fishery products was 7.4 kg (16.3 pounds) of edible meat per person in 2003, a record high. US consumers spent an estimated $61.2 billion for fishery products in 2003, including $42.0 billion in expenditures at food service establishments (restaurants, carry-outs, caterers, etc.); $18.9 billion in retail sales for home consumption; and $290.4 million for industrial fish products. By producing and marketing a variety of fishery products for domestic and foreign markets, the commercial marine fishing industry contributed $31.5 billion (in value added) to the US Gross National Product. The US ranks third in the world in seafood consumption.

3. Supply

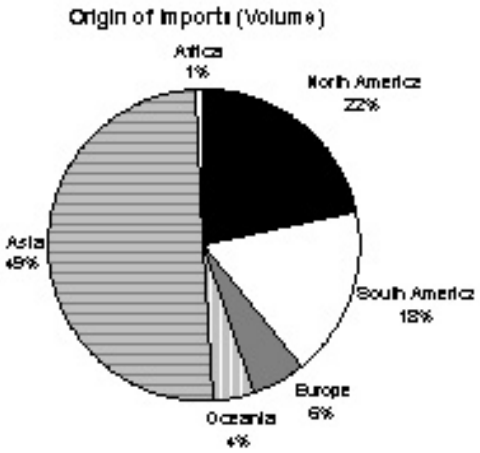
The US supply of edible fishery products (domestic landings plus imports, round weight equivalent, minus exports) was 5.3 mmt (11.8 billion pounds) in 2003. The supply of industrial fishery products was 590 mmt (1.3 billion pounds) in 2003.

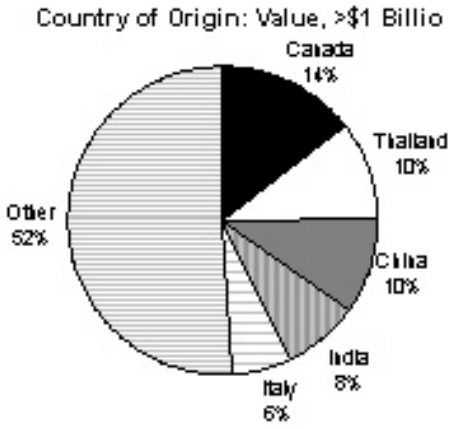
4. Trade

Exports. Per FAO, in 2002, the US was the fourth largest exporter of fishery commodities, behind Thailand, China, and Norway. The total value of exports in 2003 was $12.0 billion, comprised of about 1.1 million

metric tons of edible products valued at $3.3 billion plus inedible products valued at $8.7 billion. The principal seafood exports were fresh and frozen groundfish and salmon, surime, and lobsters, canned salmon, caviar, and roes. Japan is the leading destination at 31% followed by Canada, South Korea, China, and Germany [xlv].

Imports. The total value of US imports of fishery products in 2003 was $21.3 billion. The edible portion was $11.1 billion, comprised of 2.2 million metric tons. The dominant item is shrimp which accounts for 34% of the total, followed by tuna in various forms. About 90 percent are fresh or frozen. Canada and China are the leading sources at 15% each of the volume, followed by Thailand, Chile, and Ecuador. Per FAO, in 2002, the US was the second largest importer of fisheries commodities, behind Japan. The following charts show the edible imports from major areas by volume and value in 2003.





The following chart shows the growth in value of US fisheries product imports since 1992[xlvi].

chart2.jpg

Exports of aquaculture products are relatively small: some farm-raised trout and salmon chiefly to Canada and Mexico and oysters and clams to Canada. The catfish industry has been attempting to develop export markets in Europe but has met with limited success. The ornamental fish industry exports its products to a number of countries, but the US is a net importer of ornamental fish. On the other hand, the US is a major importer of farm-raised seafood products: the largest categories are shrimp, salmon, and tilapia[xlvii].

5. Food security

Fisheries and fish products contribute to food security in the US, but many alternatives are available. Purchase decisions by consumers are made in a setting of many competing foods and are based on attractiveness, price, convenience and cultural background.

Eighty-nine percent of American households were food secure throughout 2003: they always had access to enough food for an active, healthy life for all members. The remaining households were food insecure at least some time during that year. Food insecurity with hunger occurred at some time during the year for 3.5 percent of households. In 2003, the typical US household spent $38.00 per person each week for food - 26 percent more than the cost of the Thrifty Food Plan for its household type[xlviii]. Families spent only 10.1 percent of their 2003 disposable personal income on food Ð falling from 25% in the last 70 years. Spending on food away from home was 47 percent of the $948.6 billion in total food expenditures in 2003 and spending for food at home was 53 percent[xlix]. $61.2 billion (6%) of the total was for fishery products[l].

6. Employment

There are 36,000 (2002) fishers and related fishing workers[li]. The secondary sector employs 67,472 (2002) working in 935 plants and 2,446 wholesaler firms[lii].

VI. Fishery sector development

1. Constraints

The condition of the fish stocks upon which the US industry depends appears to be steadily improving. The number of overfished stocks varies from region to region but is decreasing. Because of the lengthy times they need to mature and reproduce, some of the long-lived species will require rebuilding schedules up to decades. Of 909 fish stocks included in the 2004 report to Congress, 565 have unknown or undefined status relative to acceptable target stock abundance and harvest rate. However, these stocks represent less than 1 percent of all US fishery landings by weight. Of the major stocks, representing 99 % of landings, 39 were overfished, 122 are not, and 94 have unknown or undefined status[liii].

A recent study of a number of Federally managed fisheries reports that 55 % of the assessed fisheries have some measurable over-capacity, 29 % do not, and information is lacking for the remaining 16 %. In some regions, vessels and fishing permits are being bought and retired as part of a Federal buy-back program[liv].

2. Development prospects/strategies

The outlook for the Nation's living marine resources depends in good part on the management actions that are being taken at present. The decline in the abundance of many stocks in all US regions during the past few decades was primarily the result of overfishing (sometimes compounded by environmental changes). The strengthened management measures, designed to reduce overfishing and begin rebuilding, that are being implemented should result in an acceleration in the rate of improvement of stock status and fishery utilization levels. Their success depends on how effectively they can be implemented over the foreseeable future. Short-term losses in yield are expected as an immediate cost of rebuilding overfished stocks. However, judging from the remarkable ability of many stocks to recover from overfishing, the outlook is very positive over the long term, and should result in the potential for higher sustainable yields with reduced risk to the resources [lv].

Aquaculture production is expected to continue to expand. The positive factors include new technologies for systems that recirculate water, new techniques for obtaining brood stock, development of faster growing animals, and some easing of the regulatory burden in planning and implementing new facilities. Increased attention is being paid towards cleaning effluents, minimizing facility impacts on the environment, navigation, and on aesthetic views. Issues are being addressed to facilitate placing facilities offshore, out of the sight of land.

Inland fisheries will likely remain about the same, with the majority of production being harvested by the recreational sector. As water quality continues to improve, fisheries production will find easy access to dinner tables, no matter how it is caught.

3. Research

a. Overview and Priority Setting

Maximizing the long term potential yield of US fisheries is accomplished through acquiring and interpreting information, a commodity with intrinsic value, and with a cost associated with its acquisition. Increasing its quantity and quality comes at a cost, but also diminishes risk of lost scientific credibility and public confidence, lost revenues resulting from over-fishing, and/or lost ecological integrity. It is incumbent upon natural resource policy makers, with input from stakeholders, scientists, and managers, to balance the cost of information with the risk of failing to build sustainable fisheries due to inadequate information.

Most of the work on US marine fisheries is conducted by or for NMFS. Since 1871, Federal fisheries scientists have collected, researched, analyzed, and published peer-reviewed data on the Nation's living marine resources, marine ecosystems, and the benefits that they provide. Additional biological, economics, and other types of research are also conducted by universities, other Federal, and state agencies.

United States marine fisheries must be managed for optimum yield based on the best scientific information available. Managers are to prevent overfishing, identify and rebuild overfished stocks, ensure conservation,

facilitate long-term protection of essential fish habitat, reduce bycatch, increase stock assessments, and are to realize the full long-term potential of the resources. The law stresses that reliable data is essential to effective conservation, management, and scientific understanding. Better assessments can provide more accurate abundance estimates and forecasts, reducing uncertainty in setting quotas, and lowering the costs of following the precautionary approach. Better assessments also invoke more confidence from the fishing industry, encouraging better compliance with regulations. Research in bycatch, essential fish habitat, life history, and ecosystems holds the promise for progressing from reactive management towards adaptive management, allowing maximum catches with reduced risks for the fisheries[lvi].

NMFS analyses underlie agency scientific reports, regulatory documents, and technical presentations to fishery managers, industry and environmental groups, the media, and to the public and scientific community. The NMFS Scientific Editor and the Scientific Publications Office help ensure the editorial and scientific integrity of research products. Thus, the agency's scientific research and publishing provide the foundation for its stewardship programs. Recently, NMFS instituted a science quality assurance program to consistently monitor and review its research efforts. This program identifies gaps in infrastructure, facilities, and resources that are affecting the productivity of scientists.

NMFS has six regional Science Centers with 30 laboratory facilities nationwide and over 1,500 scientific and support personnel. The scope of their work is broad in time, space, and discipline. These Science Centers provide the scientific knowledgebase on which NMFS formulates stewardship policies through its six Regional Offices. Research at NMFS laboratories supports resource managers in NOAA, fishery management councils, interstate fishery commissions, and other agencies in making informed marine resource management decisions for sustainable fisheries, protected resources, endangered species, and habitat.

Since marine fisheries are managed on a regional basis, the focus of research varies among the Science Centers. Each Center develops annual priorities, based on regional and national needs, through dialogue with his/her Regional Administrator, Councils, the Program Offices in NMFS headquarters, and with user groups and other interested parties. Within each Center, teams of researchers develop research plans. NMFS' longer-term research program is coordinated by the Headquarters' Office of Science and Technology. The Office Director and the six Science Center Directors comprise the Science Board. The Board is responsible for ensuring the integrity and quality of research, addresses national science issues, and develops science policy.

The NMFS science program has extensive collaborations with academia, many through cooperative agreements and grants. These partnerships enhance NMFS' research capability. Many NMFS scientists serve as adjunct professors at universities, offering intellectual stimulation and challenges for agency scientists to remain on the cutting edge, while expanding the capability of the university. Academic scientists also play an important role in the periodic review and evaluation of the quality and relevance of NMFS research. The Science Centers work with other Federal and state agencies, international entities, non-governmental organizations, and the private sector, including the fishing industry.

The scale and scope of NMFS research varies. Some major research initiatives focus on the needs of the fishing industry and are performed jointly with industry, such as studies of harvesting methods and development of more effective fishing gear to reduce wasteful bycatch. Studies of the impact of oil and gas extraction activities on the continental shelf are conducted in cooperation with the Minerals Management Service (http://www.mms.gov).

The research plans are jointly developed with partners and constituents. The research programs are periodically reviewed by informal and formal program reviews. NMFS scientists serve on Council Scientific Steering Committees where research inadequacies are identified and then addressed through NMFS programs. Regulatory and judicial proceedings also identify needs that are incorporated into the research program. United States and international scientists work together to acquire information needed to manage US and high-seas fisheries. The NMFS Research Plan (http://www.st.nmfs.gov/st2/strategic_plan.html) is the ultimate integration of the research needs of US society and its legislative, executive, and judicial institutions.

NMFS scientific information must be comprehensive, objective, credible, and effectively communicated so that

its validity and that of resulting management decisions are accepted by those regulated and other constituents.

b. Types of Research

Management of US fishery resources is an extremely complex process, requiring the integration of basic and applied research, outputs of sophisticated stock assessment models, socioeconomic factors, and allocations among user groups to maximize the benefits of the resource to the Nation. At the very foundation of that process, however, are fishery resource data that lead to credible, high-quality information that minimizes risk in management decision-making.

The types of data used in fisheries management are nearly as diverse as the list of organisms the data represent. Likewise, the data come from a wide variety of sources. Dock-side sampling programs gather data from commercial and recreational fisheries landings. Observers are placed on commercial vessels to obtain information on bycatch, which is not represented in dock-side landings. Satellites are used to obtain sea surface temperature, wind, and ocean color data. Vessels are chartered from private industry and universities for certain types of at-sea data collection. However, dedicated fisheries research vessels (FRVs), are the most critically important tool in NMFS' marine resource data collection regime. Fully committed to fisheries missions, FRVs provide a consistently available research platform, protecting the integrity of long-term data sets. Continuance of the FRV surveys and their data bases is a major issue. The vessels that form the core of the FRV fleet are approaching the end of their useful lives but one replacement vessel has just entered service in 2005 and 3 others are under construction or budgeted. It is important that new vessels be procured in time to allow calibration with the fleet built early in the 1960's Decade of the Ocean. At-sea data are collected by the NOAA fleet using about 1,900 days at sea (DAS), supplemented by about 1,200 DAS of chartered university and private industry vessels.

Collaborative research to protect and enhance fishery resources includes mapping, spatial analyses, geographic information systems, and fishery and ocean habitat modelling and characterization, as well as an evaluation of ecosystem approaches focusing on spatially-explicit models and research into trophic relationships. Also, with the increasing need to seek new management approaches to enhance and conserve essential fish habitat, NMFS is studying the use of areas closed to fishing for conservation and research purposes. Further, NMFS is evaluating the potential impacts of fishing gear on habitat and fisheries production.

Research is expanding the use of innovative new technologies and techniques including multi-beam sonars and LIDAR (Light Detection And Ranging) laser technology as a biomass assessment tool for near-surface pelagic species, and using underwater (laserline) technology for identification of habitat types and species. Additionally, manned submersibles and remotely-operated vehicles are used to directly evaluate deepwater species and their habitat.

Knowledge of decadal and wide-scale climate variability and its impacts on fisheries productivity is essential to effective fisheries management. Sudden shifts in climate regime, as seen recently in the North Pacific, have immediate and major impacts on fisheries productivity. The Fisheries and the Environment (FATE) program will provide the information necessary to effectively adapt management to mitigate the ecological, social and economic impacts of major shifts in the productivity of natural resources in the North Pacific, Bering Sea and Hawaiian Islands. FATE activities began in 2002, with a phased approach. Activities will be conducted through partnerships between NOAA and collaborating state, Federal and academic institutions.

c. Major Fishery Research Goals and Objectives

For most of US stocks there is at least basic information on landed catch and the size frequency of the catch. However, for over a third there is no fishery-independent or fishery-dependent index of abundance, making it extremely difficult to conduct a meaningful assessment. Other factors, such as the need to prioritize the stocks to be assessed, result in most stocks lacking assessments sufficient to evaluate their biomass. On the other hand, although there are relatively few stocks with comprehensive input data, over 100 stocks are routinely assessed using state-of-the-art age or size structured models, some of which may also incorporate spatial and oceanographic effects. With a few exceptions, all of the high-valued, high-volume, or high-profile

species are routinely assessed, while most of the unassessed species contribute little or nothing to total landings. Overall, the two most important needs for augmentation are research vessel surveys designed to produce fishery-independent indices of abundance and to collect related information on spatial and temporal distributions, associated species, habitat, and oceanographic variables; and observer programs that provide information on species composition, amounts of each species kept and discarded, and fishing effort. The major fishery research goals and objectives are provided in the NMFS Research Strategic Plan available at http://www.st.nmfs.gov/st2/strategic_plan.html.

d. Science Quality Assurance Program

NMFS has made consistent investments in conducting high-quality science. The Science Quality Assurance Program was established to document, formalize and, where appropriate, standardize the collective efforts of the various NMFS research units. The goal is to ensure that fisheries science is relevant, timely, objective and accurate. Plan components include: *Strategic Plan for Fisheries Research* . (http://www.st.nmfs.gov/st2/strategic_plan.html); *Stock Assessment Improvement Plan* . (http://www.st.nmfs.gov/st2/saip.html); *NMFS Data Acquisition Plan.* (http://www.st.nmfs.gov/st2/omb_link.html); *NMFS Fisheries Science Center Accreditation; Fisheries Assessment Computational Toolbox.* A set of software for stock assessments; *Center of Independent Experts.* (http://www.rsmas.miami.edu/groups/cimas/CIE_main_page.html); *External Independent Studies (* by National Research Council http://www.nas.edu/nrc/); and the *NMFS - Sea Grant Fellowship in Population Dynamics and Marine Resource Economics* (http://www.nsgo.seagrant.org).

4. Education.

Fisheries extension to the marine (and Great Lakes) fishing industry is mostly handled through the National Sea Grant Program (http://www.nsgo.seagrant.org), sometimes with technical assistance from NMFS or others. Sea Grant also seeks to educate future environmental professionals and leaders and to enhance marine and aquatic science literacy among the general public. The Sea Grant network offers a variety of programs and resources in marine and aquatic sciences for K-12 students and teachers, undergraduate and graduate students and the general public. These include publications, workshops, conferences, summer internships, informal education for the general public, radio programs, websites, videos and other electronic media on topics ranging from coastal ecosystems to marine biotechnology. The Sea Grant Educators Network offers a variety of resources for students and teachers.

5. Foreign aid

The US Agency for International Development (USAID) is the primary US agency providing foreign aid. It is an independent agency that provides about $4 billion in economic, development and humanitarian assistance around the world in over 100 countries in support of the foreign policy goals of the US. Fisheries and aquaculture projects are key ingredients in the mix of integrated programs in several countries. Detailed information about priorities and country projects is available at http://www,usaid.gov.

VII. Fishery sector institutions

Management within the EEZ is the responsibility of the Federal government (NMFS) and the eight regional Fishery Management Councils, established by the MSFCMA. NMFS is part of the National Oceanic and

Atmospheric Administration (NOAA) within the Department of Commerce. NMFS is often referred to as NOAA Fisheries, and more recently, NOAA Fisheries Service. NMFS provides scientific and technical services and programs in support of fisheries management and conservation. NMFS employs about 2,500 people across the country in six regional offices and science centers and at its headquarters in Silver Spring, Maryland. There are over 20 laboratories plus other facilities, particularly near fishing centers.

NMFS coordinates and approves fishery management plans, implements and enforces regulations, and conducts other fisheries conservation and service programs. To ensure productive fisheries in the future, NMFS will implement a number of strategies to ensure that ecosystem approaches to management are applied in the conservation and management of Federal, state, and international fisheries; that the public promotes stewardship of marine fisheries; and that fish stocks are maintained at productive levels to support sustainable fisheries and ecosystems. Strategies include:

¥ Implement fully a regulatory quality improvement program

¥ Strengthen coordination of marine fisheries management and conservation

¥ Increase opportunities for industry to improve economic performance

¥ Issue guidance for ecosystem approaches to management

¥ Increase public understanding of the NMFS stewardship role

¥ Manage to recover all overfished stocks under effective rebuilding plans.

The eight Councils develop Federal fishing plans and regulations through a process involving technical teams, independent scientific committees, constituent advisory panels, enforcement officials, lawyers, management agencies, and the public. Council members are nominated by state governors in each region and appointed by the Secretary of Commerce. On each council are each state's director of marine fisheries; a person knowledgeable of fisheries or marine conservation from each state; and some at-large members from any of the states in the region. Councils have Scientific and Statistical Committees (of scientists and other technical persons) and Advisory Panels (of people knowledgeable in fisheries or conservation). The plans and their concomitant regulations are submitted to NMFS for approval and implementation. Copies of the fisheries legislation and related documents, including guidelines, can be found at http://www.nmfs.noaa.gov/sfa/index.htm. Links to the Councils are at http://www.nmfs.noaa.gov/partnerships.htm. The NMFS organization chart is at http://www.nmfs.noaa.gov/org_chart.htm. The US Coast Guard (http://www.uscg.mil/uscg.shtm) works with NMFS on at-sea enforcement.

Inland fisheries are managed by the individual states with some technical and coordinating support from Interior Department agencies, particularly USGS and FWS (see above). Fisheries in the Great Lakes are managed by the US Great Lakes states and the Canadian province of Ontario under coordination of the Great Lakes Fishery Commission. The Commission was established through the Convention on Great Lakes Fisheries between Canada and the US in 1955. More information about the Commission is available at its Web site: http://www.glfc.org/.

Nearshore fisheries, within the 0-3 nm (in most states) territorial sea, are managed by coastal states and three interstate marine fisheries commissions. State agencies manage fishery resources within state waters, developing programs, policies, and conservation regulations. The commissions are used by the states as an instrument for joint action, focusing on issues that affect multiple states. The commissions coordinate data collection, research, and responses to fisheries issues. Membership in the commissions include the states of the region, government and industry leaders, and representatives of the fishing sectors. Links to the Commissions are at http://www.nmfs.noaa.gov/partnerships.htm.

Beyond the EEZ, open-ocean fisheries are studied and governed by international laws and multi-lateral treaties, agreements and organizations. The US actively participate in scores of these to help build sustainable fisheries, including the International Convention for the Conservation of Atlantic Tunas, the Inter-American Tropical Tuna Commission, the Northwest Atlantic Fisheries Organization, and the United Nation's Code of Conduct for Responsible Fisheries.

VIII. General legal frameworks

1. Internal Regulations

The MSFCMA is the primary fisheries law in the US. It mandates strong action to conserve and manage fishery resources that contribute to the food supply, economy, and health of the Nation. Its provisions require NMFS to use the best scientific information available, end overfishing, rebuild all overfished stocks, and conserve essential fish habitat through research and consultations on Federal and state actions which may adversely affect such habitat. The MSFCMA and related documents are available at http://www.nmfs.noaa.gov/sfa/index.htm.

The 10 national standards in the Act provide the roadmap for US marine fisheries actions. Any FMP prepared, and any regulation promulgated to implement any such plan:
Rome Articles 38-47, namely:

- Shall prevent overfishing while achieving optimum sustained yield from each fishery.
- Shall be based upon the best scientific information available.
- Shall manage, to the extent practicable, an individual stock of fish as a unit throughout its range, and interrelated stocks of fish as a unit or in close coordination.
- Shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among US fishermen, such allocation shall be fair and equitable to all, reasonably calculated to promote conservation, and no particular individual, corporation, or other entity may acquire an excessive share of privileges.
- Shall, where practicable, consider efficiency in the use of fishery resources; except that no measure shall have economic allocation as its sole purpose.
- Shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.
- Shall, where practicable, minimize costs and avoid unnecessary duplication.
- Shall take into account the importance of fishery resources to fishing communities in order to provide for the sustained participation of such communities, and minimize adverse economic impacts on such communities.
- Shall, to the extent practicable, minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.
- Shall, to the extent practicable, promote the safety of human life at sea.

The MSFCMA interacts with other important Federal and state laws such as the Marine Mammal Protection Act, the Endangered Species Act, the Coastal Zone Management Act, and the National Marine Sanctuaries Act.
The US fishing fleet is diverse in terms of sizes and gear types, varying significantly among fisheries as well as among geographic areas. Even individual fleets are quite diverse, and each fishery has unique biological, economic, and sociological characteristics that make broad-based policy impractical. For example, see US commercial fishing photos at http://www.oceansart.us. On the other hand, regulation on a fishery-by-fishery basis is not practical or effective. Vessels are extremely mobile and often able to change gear types readily. In addition, retiring vessels from fishing is often difficult; once a vessel is built and equipped for fishing, few alternative uses exist for it. This provides incentive for vessels to transfer effort from one fishery or geographic location to another, rather than leave fishing altogether, when regulations become binding. When vessels shift effort to open-access fisheries or to those regulated with traditional command and- control methods, the new vessels may impose stock and/or crowding externalities on existing vessels. When controlled access systems are in place, these externalities are taken into account when fishermen decide whether or not to enter a new fishery. Fishermen would only shift effort to another fishery if it were worth the cost of purchasing the right to harvest in that fishery. Thus, management systems that take into account

the potential transfer of effort, and provide the correct incentives and signals for entry and exit of vessels and fishermen, are important for ensuring that effort reductions in one fishery do not exacerbate conditions in other fisheries[lvii]. Several important US fisheries are managed through systems that limit effort.

Under the MSFMCA, eight Regional Fishery Management Councils are charged with preparing Fishery Management Plans (FMPs), using the best scientific information available, for the fisheries needing management within their areas of authority. After the Councils prepare FMPs that cover domestic and foreign fishing efforts, the FMPs are submitted to the Secretary of Commerce (Secretary) for approval and implementation. The Department, through NMFS agents and the US Coast Guard, is responsible for enforcing the law and regulations. Enforcement is done at sea using USCG vessels and USCG and NMFS personnel, and onshore using NMFS enforcement agents. Agreements with 21 coastal states and three US territories make available over 2,000 state resource officers. In addition to patrol services, automated surveillance is provided through the use of satellite-based vessel monitoring systems, which currently monitor over 2,200 vessels. These systems provide for reporting catch, identifying vessels, reporting a ship's position, routine communications and communicating emergencies.

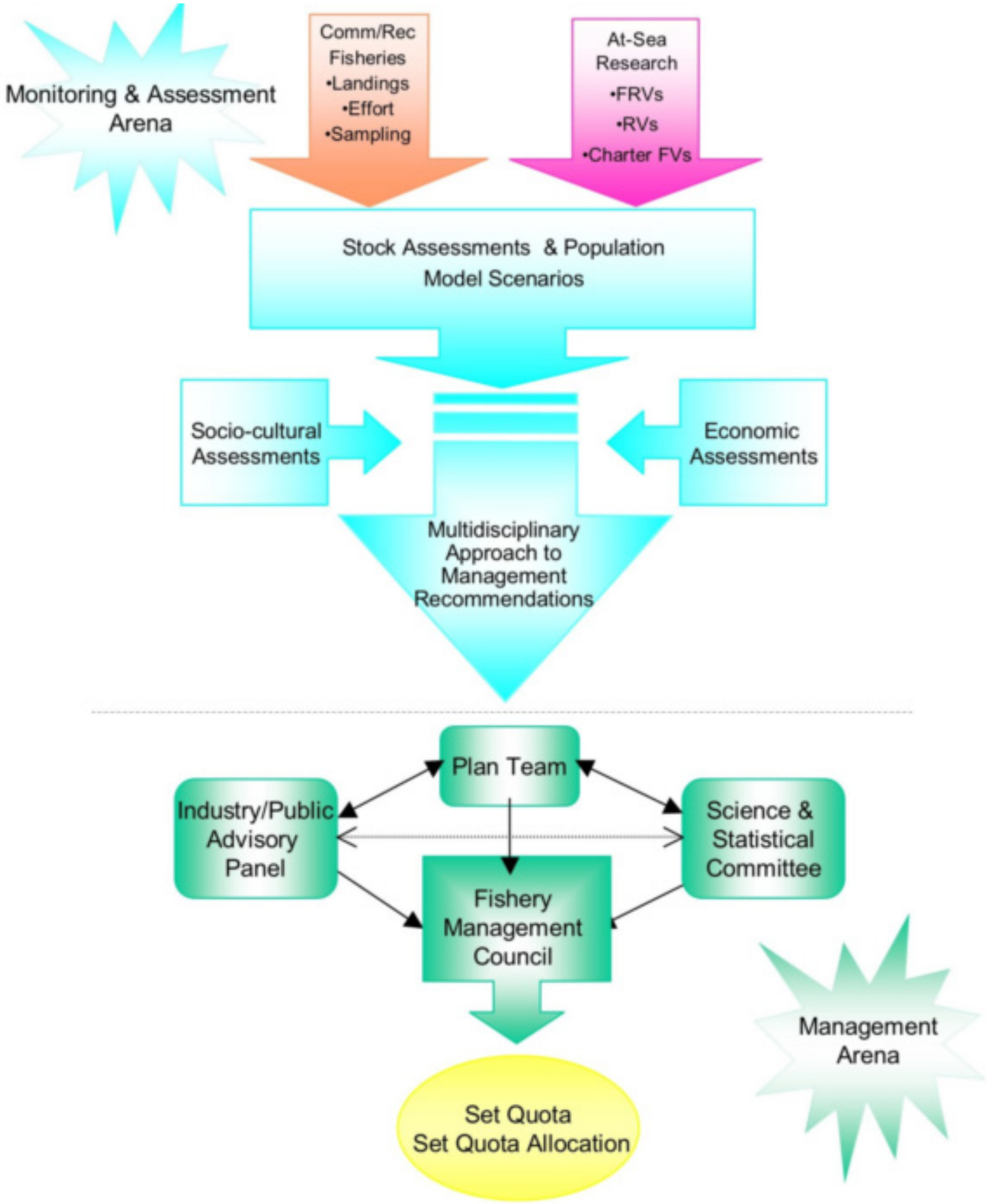
The Secretary is empowered to prepare FMPs in the Atlantic and Gulf of Mexico for highly migratory species. Where no FMP exists, Preliminary Fishery Management Plans (PMPs), which only cover foreign fishing efforts, are prepared by the Secretary for each fishery for which a foreign nation requests a permit. The Secretary is also empowered to produce an FMP for any fishery that a Council has not duly produced. In this latter case, the Secretary's FMP covers domestic and foreign fishing.

The Atlantic swordfish, Atlantic sharks, and Atlantic billfish fisheries are currently managed by the Secretary under the MSFCMA, and the Western Atlantic bluefin tuna fishery is managed under the MSFCMA and the Atlantic Tunas Convention Act[lviii].

NMFS and the Councils have developed and implemented 46 Fishery Management Plans to manage domestic fishery stocks, under the authority of the MSFCMA. Of these, two are Secretarial FMPs developed by NMFS for Atlantic highly migratory species. Another nine Plans are under development. The Plans and links to further information are available through http://www.nmfs.noaa.gov/sfa/domes_fish/FMPS.htm.

All Council-prepared FMPs must be reviewed for approval by the Secretary of Commerce and then implemented by NMFS through Federal regulations. The FMPs are amended by the Councils and the amendments are submitted for approval under the same Secretarial review process as new FMPs. Most of the FMPs have been amended since initial implementation.

Data from survey vessels, landing statistics and other sources flow through an analytical system that brings information before decision makers across the fisheries spectrum. The following figure provides an overview of the flow and processes[lix].



2. Foreign Fishing And Management Of Shared Stocks

The MSFCMA reaches beyond the EEZ in also providing for fishery management authority over continental shelf resources and anadromous species, except when they are found within a foreign nation's territorial sea

or fishery conservation zone (or equivalent), to the extent that such sea or zone is recognized by the US.

Under the MSFCMA, the Secretary of State, in cooperation with the Secretary of Commerce, negotiates Governing International Fishery Agreements (GIFAs) with foreign nations requesting to fish within the EEZ. After a GIFA is signed, it is transmitted by the President to the Congress for ratification.

As US fishing capacity grew following passage of the MSFCMA, foreign participation in directed fisheries, as well as in foreign joint ventures in which US vessels delivered US harvested fish to permitted foreign vessels in the EEZ diminished until, in 1991, foreign vessels no longer were permitted to conduct directed fishing in the EEZ. This marked the achievement of one of the objectives of the MSFCMA, that is, the development of the US fishing industry to take what were in 1976 underutilized species, and the displacement of directed foreign fishing effort in the EEZ. Although there has been very little foreign fishing allowed since 1991, NMFS maintains foreign fishing regulations should there be a future situation in which allowing limited foreign fishing in an underutilized fishery would be of advantage to the US.

ENDNOTES

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