Northeast Pacific Ocean

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INTRODUCTION

This review provides an overview of marine capture fisheries and current fisheries management regimes for coping with contemporary issues in the northeastern Pacific Ocean. It builds upon FAO country-level reviews and questionnaires and a number of other sources.[1]

The Northeastern Pacific Ocean regions[2] that form this sub-regional review include Canada[3], the continental Pacific United States (US)[4] and the US Pacific Islands.[5] The combined exclusive economic zone (EEZ) for these countries is 659 million hectares, with total commercial landings in 2003 of more than 766 thousand tonnes worth US$ 457 million (US$ 2002) (BC Ministry of Environment, 2005; NOAA, 2004a). The EEZ of the US Pacific and Pacific Islands constitute an area of 78 million hectares and 535 million hectares respectively, the latter representing more than half of the total US EEZ (WPFMC, 1999). By comparison, Canada's Pacific EEZ is 46 million hectares (Canadian Navy, 2001).

In each region, fisheries are classified into commercial, artisanal[6] and recreational, with commercial fisheries dominant in catch and landings. Recreational fisheries in each area compete strongly in terms of overall economic activity, particularly those targeting Pacific salmon, tuna and billfish in the US Pacific Islands. Pacific salmon in Canada have an iconic status that draws intense cultural, social and political interest, especially those related to aboriginal fisheries and territorial claims. The most important catches in Canada and the continental United States are groundfish, notably North Pacific hake (whiting), Pacific salmon and Pacific herring. Dungeness crab, albacore tuna rank high in Oregon and California States. Domestic commercial fisheries in waters surrounding the Pacific Islands are dominated by tuna, swordfish snappers, groupers and some pelagic fish.

Economic activity generated by the fisheries sector Canada and the US Pacific regions is a relatively minor part of each nation's gross domestic product (GDP)[7]. However, the fisheries sector is important to many specific coastal communities as

[1] The validity of the data for this review should be used with caution; produced from a variety of sources, they may not have been cross-checked and may be out of date. Where possible the dated source of the data is provided.
[2] The term "nation" in this review refers to Canada and the USA, while "region" refers to each of Canada, US Pacific and US Pacific Islands.
[3] For this review, Canada's Pacific Region is constituted by the province of British Columbia and Yukon Territory. The Yukon Territory, though salmon producing, is not part of this review.
[4] The States of Washington, Oregon and California.
[5] The Territory of American Samoa, Territory of Guam, State of Hawaii, Commonwealth of the Northern Mariana Islands, Jarvis Island, Howland and Baker Islands, Palmyra Island, Kingman Reef, Johnston Island, and Wake Island.
[6] In Canada, almost all artisanal fisheries are carried out by aboriginal groups and are referred to as aboriginal fisheries to be consistent with language of the courts.
[7] Canada's Pacific region economic activity is less than half of one percent of British Columbia's GDP (Gislason, 2004); fishing, forestry and hunting combined are 0.3 percent of the total US GDP (Everett, 2005).

source of jobs and secondary industry activity throughout the sub-region. High quality commercial fisheries products in the US Pacific Islands are marketed worldwide and contribute significantly to a high demand by a culturally diverse population in the region for quality fresh fish (WPFMC, 2003).

A more in-depth review of the fisheries in the northeastern Pacific follows with a closer look at policy and legal frameworks, fisheries status, fisheries management and governance and adherence to global mandates and initiatives.

POLICY FRAMEWORK

Marine capture fisheries in Canada and the United States, including the US Pacific Islands, operate primarily under national legislation. Canada's capture fisheries are directly managed under the Fisheries Act and influenced by several other federal statutes that are discussed in more detail in the next section. The Magnuson-Stevens Fishery Conservation and Management Act (MSA)[8] is the primary fishery management legislation in the United States, augmented by local-level legislation that manages fisheries under State, Territorial and Commonwealth jurisdiction.

Canada's Fisheries Act does not provide policy guidance, whereas the MSA does. The MSA as amended by the Sustainable Fisheries Act of 1996 lays out policy objectives of:

- Achieve optimum yield;
- Prevent overfishing and rebuild overfished stocks;
- Minimize bycatch;
- Protect essential fish habitat;
- Employ best available science;
- Conduct fishery research and monitoring; and
- Provide for regional participation and implement administrative processes.

Further, the MSA sets out ten National Standards with which Fishery Management Plans (FMP) must be consistent. The National Standards provide guidance in matters related to fishery conservation and management, such as: prevention of overfishing, best science, allocation, resource utilization, costs and duplication, bycatch and human safety. The MSA covers both commercial and recreational fisheries and establishes eight regional councils, including the Pacific Fishery Management Council and the Western Pacific Fishery Management Council. The Councils, among other responsibilities develop FMPs for their respective regions.

Fisheries policies in Canada are developed by the national government in consultation with provincial and territorial authorities, aboriginal groups, stakeholders and the public.[9] Communication of these policies is characterized by Ministerial announcements, regional news releases and specific references in the FMPs. Of the many policy initiatives over the past ten years, the most seminal was a discussion paper that set out the direction for management of salmon in the Pacific region (DFO, 1998) and set the stage for other non-salmon fisheries by outlining nine principles under the framework of resource conservation and sustainable use, paraphrased by:

- Conservation as the primary objective;
- Precautionary approach in fisheries management;
- Net gain in productive habitat capacity;
- An ecological approach to fisheries and oceans management;
- The long term over short term considerations in management decisions;
- Selective fishing methods to be used in all salmon fisheries;

[8] The MSA is available on the NOAA Fisheries Service web site (http://www.nmfs.noaa.gov/).

[9] Policy documents for Canada's Pacific marine capture fisheries can be found on the Fisheries and Oceans Canada – Pacific Region web site (www.pac.dfo-mpo.gc.ca).

BOX 1
Influence of Aboriginal Treaty Claims on Fisheries in Canada

Fisheries in Canada are under rapid change. The influences are many, but probably the most notable change agent is clarification of aboriginal rights, which are continually shaped by the courts and negotiated treaty claims. Section 35 of the Constitution Act, 1982 recognizes and affirms the existing aboriginal and treaty rights of the aboriginal peoples of Canada. In light of section 35, and the decisions of the Supreme Court of Canada in R. V. Sparrow and other cases involving section 35, DFO has committed to providing aboriginal people with reasonable opportunities to fish for food, social and ceremonial fishing purposes and to providing such fishing with priority over commercial and recreational fishing (DFO, 2005).

Since the landmark Sparrow decision, which established aboriginal food, social and ceremonial rights to fish, there have been a series of court decisions further defining aboriginal fishing rights, including commercial use of fish in specific cases. At the same time, significant efforts are being made by the federal and British Columbia governments through the BC Treaty Commission. The Commission was established in 1992 to resolve long-outstanding treaty issues in the province. Unlike other parts of Canada, there are only a handful of treaty settlements in British Columbia. There are currently 57 claims before the Commission; five claims are in the final stages. The vast majority of these treaty claims involve access to fish resources based on traditional use. Only one modern-day treaty (Nisga'a) has reached settlement since its inception, and it was outside the treaty commission process. The Nisga'a claim and recent agreements-in-principle have fish harvest agreements attached to, but not part of, the agreement, which provide for a defined level of fish access and fishery management responsibilities within their respective territories. To respond to court decisions and the treaty process, DFO has implemented a number of policies, including voluntary licence retirement and resource allocation transfer programs that shift access from the commercial fishery to aboriginal groups. This trend is expected to continue, and likely accelerate in the foreseeable future, thus re-shaping fisheries management on Canada's Pacific coast.

- Allocation priorities between fishing sectors; and
- The commercial fishery to be a more diversified and economically viable.

Following this were policies on salmon allocation (1999), improved decision making (consultation) (2000), selective fishing (2001) and the most recent, Canada's Policy for Conservation of Wild Pacific Salmon (2005). The principles in these policies have been reinforced, refined and built upon by other DFO initiatives, some of which are shaped, to a large extent, by ongoing aboriginal treaty settlements. For example, Pacific Fishery Reform[10] is guided by detailed visions and principles that include resource allocation and transfer principles and strengthen the vision of an economically viable, co-managed and self reliant commercial fishery.

While Canada's Fisheries Act is silent on participatory processes, it is the Canadian government policy to consult citizens the development of laws, regulations and policies that may affect them. Both nations have established extensive advisory and consultative processes, though the United States could claim to be more transparent through to the final decision-making. That, and the establishment of policies and standards within the MSA, may in part explain why more natural resource management decisions are referred to the courts in the United States than in Canada, with the possible exception in Canada of aboriginal fishing rights.

[10] Fisheries and Oceans Canada News Release, April 14, 2005 (www.pac.dfo-mpo.gc.ca).

The next section examines in more detail the legislative structure and history of each nation and how these legal instruments relate to international law and agreements.

LEGAL FRAMEWORK

United States

The 1976 MSA, enacted amid negotiations over the United Nations Convention on the Law of the Sea, extended jurisdiction over fishery resources out to 200 nautical miles (nm). The MSA was amended with major revisions in 1982 and then in 1996 with passing of the Sustainable Fisheries Act and was re-authorized in December 2006.[11] The MSA created eight regional councils[12] that, in addition to developing FMPs for Secretary of Commerce approval, are responsible for general management of the fisheries in the three to 200 nm EEZ. Local authorities usually manage fisheries within their respective three nm zones. The purse seine fishery for tunas in the western and central Pacific is one United States fishery that is generally managed apart from the FMPs.

National authority for fisheries management resides with the US Department of Commerce within National Oceanic and Atmospheric Administration (NOAA) under the National Marine Fisheries Service (NMFS). The NMFS is responsible for the management, conservation and protection of living marine resources within the United States' EEZ (waters from three to 200 nm offshore). Using the tools provided by the Magnuson-Stevens Act, the NMFS assesses and predicts the status of fish stocks, ensures compliance with fisheries regulations and works to reduce wasteful fishing practices. Enforcement is done at sea using US Coast Guard vessels and US Coast Guard and NMFS personnel, and onshore using NMFS enforcement agents. Agreements with coastal states and three United States Territories provide augmented national enforcement. In addition to patrol services, automated surveillance is provided through the use of satellite-based vessel monitoring systems that currently monitor over 2 200 vessels nationally.

Inshore fisheries within the continental US 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. Coordination among continental Pacific Coast states on inshore fisheries and among the state and federal managers (NMFS and the Councils) is facilitated by the Pacific States Marine Fisheries Commission.

In 1988, the United States, 15 Pacific Island nations, and one Pacific Island Territory[13] entered into the Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States (South Pacific Regional Tuna Treaty) (FFA, 1994; Coan *et al*., 2004). The Treaty is implemented in the United States through the South Pacific Tuna Act of 1988. There is also local level legislation in the US Pacific Islands to manage commercial, recreational and subsistence marine capture fisheries under State, Territorial and Commonwealth jurisdiction. For example, legislation on fisheries management is in place in American Samoa with rules published at Title 24 of the American Samoa Administrative Code.

Other national legislative instruments specific to management of fisheries in the United States include:

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[11] The United States Department of Commerce news release, December 8, 2006. Available at http://www.nmfs.noaa.gov/ mediacenter/docs/MSApassespr06.pdf.

[12] New England Fishery Management Council, Mid-Atlantic Fishery Management Council, South Atlantic Fishery Management Council, Gulf of Mexico Fishery Management Council, North Pacific Fishery Management Council, Pacific Fishery Management Council, Western Pacific Fishery Management Council and the Caribbean Fishery Management Council.

[13] Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Samoa and territory of Tokelau.

- High Seas Fishing Compliance Act of 1995. Enabling legislation to implement the provisions of the 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Vessels Fishing the High Seas (FAO Compliance Agreement).
- Shark Finning Prohibition Act of 2000. Prohibits finning, possessing or landing shark fins without the corresponding carcass.

There are also several non-fisheries-specific federal acts of legislation in the United States that influence fisheries management[14]:

- National Environmental Policy Act
- Administrative Procedure Act
- Endangered Species Act
- Marine Mammal Protection Act
- National Marine Sanctuaries Act
- National Wildlife Refuge Administration Act
- Antiquities Act

Canada

The national government of Canada has exclusive jurisdiction over all aspects of fisheries and fish habitat management. The administrative management of some regulations pertaining to certain species, particularly inland fisheries and non-tidal species, have been delegated to provincial governments, usually through formal agreements and managed by inter-jurisdictional bodies.

The primary fisheries management legislation in Canada, the Fisheries Act was originally enacted in 1868 and amended many times, most recently in 1982. The Fisheries Act gives the Minister of Fisheries and Oceans broad powers over fisheries management and access to fisheries, including absolute discretion in allocation of the resource and licensing. The Minister works through the Department of Fisheries and Oceans (DFO) which administers all laws related to fisheries and creates regulations to carry out the provisions of the Act. DFO is responsible for all aspects of commercial, recreational and aboriginal fisheries management, including: stock assessment, habitat protection, licensing and access, resource allocation monitoring and enforcement. Various regulations created under the Fisheries Act establish fishery-specific requirements and regulate, for example: commercial tuna fishing, recreational and aboriginal fishing, management of marine mammals and closure of contaminated seafood areas. In December 2006, the Canadian government proposed to modernize the Act.[15]

Canada's Pacific fisheries are influenced by other national statutes, including:

- The Coastal Fisheries Protection Act, 1985. To implement the provisions of the 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Vessels Fishing the High Seas (FAO Compliance Agreement).
- The Oceans Act, 1997. Promotes sustainable development of Canada's oceans and their resources and enables the establishment of Marine Protected Areas, the establishment and enforcement of standards designed to conserve and protect ecosystem health, and the development of integrated coastal zone management plans.
- The Species at Risk Act, 2004. To prevent endangered or threatened wildlife (terrestrial and aquatic) under federal jurisdiction from becoming extinct and to

[14] These Acts and the two fishery-specific Acts immediately above are discussed in more detail in the US country reviews within this report.

[15] Fisheries and Oceans Canada News Release, December 13, 2006. (Available at http://www.dfo-mpo.gc.ca/media/ newsrel/2006/hq-ac46_e.htm).

help in the recovery of these species. DFO is the lead agency for aquatic species listed under the Species at Risk Act. Once a species is listed, the Act specifies a defined process for determining recovery and protection actions, which is anticipated to significantly influence fisheries management decisions.

Other influencing non-fisheries- specific statues include:

- Canada National Marine Conservation Areas Act, 2002. Administered by Parks Canada to set up a national network of marine protected areas.
- Canadian Environmental Protection Act, 1999. Amongst other things regulates water pollution and contamination.
- Food and Agriculture Organization of the United Nations Act, 1985. Carries into effect the Agreement for a Food and Agriculture Organization of the United Nations between Canada and certain other Nations and Authorities.

In both the United States and Canada legislative initiatives have trended from maximum optimum use of fisheries to conservation and sustainable use, with an increased attention to ecosystem-based fisheries management. The US Sustainable Fisheries Act of 1996 emphasized: ending overfishing, limited access programs, strengthened enforcement, ecosystems pilot programs and resource restoration programs. The proposed amendments to Canada's Fisheries Act highlight expanded roles for fishery participants in decision making; the adoption of clear principles dedicated to sustainable development; and a new sanctions system to be called the Canada Fisheries Tribunal that is aimed at promoting more responsible fishing behaviour.

STATUS OF FISHERIES

The fisheries of the sub-region are diverse in methods used and scope, ranging from small artisanal or aboriginal cultural fisheries to large scale high-seas industrial fisheries. Recreational fishing is a feature of each region, generating significant economic returns. Over 100 species of finfish, shellfish and marine plants are harvested in the sub-region primarily by bottom and pelagic trawling, purse seining, trolling, longlining, gillnetting and by SCUBA diving for some shellfish. Trawl-caught groundfish, notably North Pacific hake (whiting) lead the Pacific United States and Canada landings in volume, with sardines and squid second and third in the Pacific United States, and groundfish and Pacific salmon second and third in Canada. Economically, shellfish, halibut and salmon are leaders in Pacific Canada (BC Ministry of Environment, 2005). Dungeness crab catches are a major economic contributor in Oregon and California. Albacore tuna landings are also of significance in Oregon (NOAA, 2004a). Domestic commercial fisheries in national waters surrounding the Pacific Islands are dominated by high-seas hook-and-line fisheries for tunas and swordfish and handlining for large snappers, groupers and pelagic fish. Demersal and reef-caught fish are important though secondary fisheries in Hawaii (WPFMC, 2003).

In 2003, about 2.5 million in-state marine recreational fishing participants took over 7.6 million trips and caught a total of 30 million fish in the continental Pacific United States. Eighty-five percent of the trips were made in California, followed by 8 percent in Washington, and 7 percent in Oregon. The most commonly caught non-bait species (in numbers of fish) were barred sand bass, kelp bass, black rockfish, lingcod, white croaker, coho salmon, barred surf perch, and California halibut (NOAA, 2006a).

In British Columbia, salmon, mainly chinook, is the primary target recreational species, but other salmon species, halibut, rockfish, and other fish and shellfish are also important. Angling licence sales declined in the mid-1990s but remained relatively stable at over 300 000 annually over the past five years. Angler expenditures peaked in 1994, fell throughout the 1990s, and then recently rebounded to US$ 350 million (US 2002) in 2002 (Gislason, G. and Associates Ltd. 2004).

The economic value of fisheries in the sub-region is in the order of US$ 700 million (US 2002 $). Combined US domestic landings in 2003 for Washington, Oregon

TABLE 1
Largest Fisheries by Region[1]

	Landings (mt)	Value (2002 US$ million)	Share of Total Landings (%)	Share of Total Landed Value (%)
Canada Pacific[2]				
Hake by Trawl	69 100	9.5	31	4
Groundfish Trawl	41 900	32.4	19	13
Salmon	38 400	33.4	17	13
US Pacific				
North Pacific Hake	140 326	7.5	14	4
Pacific Sardines	71 624	10.1	7	2
Squid	40 020	19.7	4	6
US Pacific Islands[3]				
Hawaii	10 685	52.4	100	100
American Samoa	4 935	10.3	100	100
Guam	163	0.7	100	100
N. Mariana Islands	169	0.8	100	100

[1] Data for Canada and US Pacific are 2003 landings, drawn from country reports and questionnaires; data for US Pacific Islands are 2003 landings drawn from NOAA Commercial Landings (NOAA, 2006a).
[2] Data for the Canadian commercial salmon fishery exclude commercial aboriginal-only fisheries.
[3] Over 90 percent of the US Pacific Islands landings comprised tunas (bigeye, yellowfin, skipjack, albacore) dolphinfish and swordfish. Landings for each of the Island complexes by species group were not readily available.

and California were 440 713 tonnes, valued at US$ 386 million (NOAA, 2006a), representing less than 0.003 percent of the US GDP and less than 0.02 percent of the combined GDP for the three States (US Bureau of Economic Analysis, 2006). Total commercial landings in the US Pacific Islands in 2004 were 16 407 tonnes, valued at US$ 67 million (US 2002 $) (Hamm *et al*., 2006).

In 2003, total commercial landings in Pacific Canada were just under 223 000 tonnes[16] of fish, with a landed (ex-vessel) value of approximately US$ 253.1 million (US 2002 $) (BC Ministry of Environment, 2005).[17] In recent years the commercial fishing and wild fish processing sectors have together generated an estimated US$ 347 million (US 2002 $) in GDP, which translates into about 0.05 percent of national GDP and 0.34 percent of regional (provincial) GDP (Gislason & Associates, 2004). The recreational fishery in Canada's Pacific region generates about half that of the commercial fishery.

The MSA requires NOAA Fisheries to report to Congress annually the status of fisheries, and to proscribe management actions to be taken in the event of overfishing, for all of which NOAA maintains a dynamic website that updates quarterly the performance of 230 stocks (NOAA, 2006c). In 2005, determinations were made of both overfishing and overfished status for 194 stocks and complexes; an additional 57 had either an overfishing or overfished determination. Overall, 81 percent of the stocks and stock complexes with known status are not subject to overfishing, and 74 percent of the stocks and stock complexes with known status are not overfished (NOAA, 2005). In the US Pacific Islands, of the 12 stocks and stock complexes with known status in 2005, three were subject to overfishing, one was overfished. However, the status of 71 percent of the stocks and stock complexes managed by the Western Pacific Fisheries Management Council was not known and 4 percent was not defined (NMFS, 2006). US Pacific and US Pacific Islands species of shortspine thornyhead, black rockfish (North), and lingcod were removed from the subject to overfishing category and the Central Western Pacific yellowfin tuna and ocean perch were determined to be subject to overfishing (NOAA, 2005). There are also concerns about the status of bigeye tuna and some shark species. A number of US salmon and steelhead stocks in the Pacific

[16] Excludes cultured species.
[17] Landed value is the price paid to commercial fishers for their catch (whole fish).

TABLE 2
Principle Species 2004 Commercial Landings in the Northeast Pacific and Probable Status

Species	Landings (mt)[a]	Countries in which fished[c] (primary bolded)	Probable status
Salmon			
Chinook	9 835	Canada, US Pacific	Healthy, specific stocks depressed, all fully exploited
Coho	4 274	Canada, US Pacific	Mixed, fully exploited
Sockeye	6 154	Canada, US Pacific	Healthy, specific stocks depressed
Pink	5 100	Canada, US Pacific	Healthy, fully exploited
Chum	21 739	Canada, US Pacific	Mixed, fully exploited
Herring and Other Pelagics			
Herring	25 771	Canada, US Pacific	Mixed
Sardine	93 563	Canada, US Pacific	Healthy
Eulachon		Canada	Mixed, bycatch issue
Groundfish			
Hake	220 037	Canada, US Pacific	Mixed
Halibut	9 037	Canada, US Pacific	Healthy, fully exploited
Sablefish	8 732	Canada, US Pacific	Healthy
Other groundfish	22 260	Canada, US Pacific	P. Cod depressed; Some rockfish depressed Lingcod mixed; Concern for flatfish and numerous species overfished or with no assessment.
Shellfish and Invertebrates			
Geoduck clams	3 374	**Canada,** US Pacific	Healthy
Red Urchin	10 471	Canada, US Pacific	Healthy
Sea Cucumber	1 922	Canada, US Pacific	Healthy
Abalone	>1	US Pacific (Oregon only)	Depressed, closed in most of sub-region
Dungeness Crab	39 837	Canada, US Pacific	Healthy, fully exploited
Prawns	2 000	Canada	Mixed
Shrimp	11 062	Canada, US Pacific	Mixed, some overfished and depressed
Intertidal Clams	2 112	Canada, US Pacific	Mixed, some overfished and depressed
Squid	39 364	US Pacific (California)	Healthy
Highly Migratory Species			
Albacore Tuna	29 451	Canada, US Pacific & Islands	Healthy, but concern about current fishing level
Tuna, Bluefin	10	US Pacific	Subject to overfishing
Tuna, Bigeye	2 584	US Pacific & Islands	Mixed, subject to overfishing
Tuna, Skipjack	749	US Pacific & Islands	Healthy
Tuna, Yellowfin	1 985	US Pacific & Islands	Mixed, subject to overfishing in US Pacific Islands
Striped Marlin	354	US Pacific Islands	Healthy
Blue Marlin	433	US Pacific Islands	Unknown
Swordfish	1 422	US Pacific & Islands	Unknown
Sharks[b]	6 295	Canada, US Pacific & Islands	Mixed
Mackerel	3 692	US Pacific	Healthy, fully exploited
Other Species			
Dolphinfish (Mahimahi)	280	US Pacific & **Islands**	Unknown
Wahoo	338	US Pacific Islands	Unknown
Other fish (Opah, billfish)	658	US Pacific Islands	Unknown

Canadian Sources: Gislason & Associates, 2004; STAR Panel, 2005; Fargo, 2005; FAO, 2005.
US Sources: STAR Panel, 2005; NOAA. 2001; NOAA, 2005; NOAA, 2006a; NOAA, 2006b; WPFMC, 1999; FAO, 2005.
[a] US Pacific Landings, 2004; US Pacific Islands Landings, 2002; Canada Landings, 2004.
[b] Sharks include dogfish, Canada's only shark landings.
[c] US Pacific Islands landings only include Hawaii and American Samoa; comparably data for the other Islands were not available at the time of this writing.

Northwest are also listed as endangered and threatened under the US Endangered Species Act (US Fish & Wildlife Service, 2006).

The status of fish stocks in Canada's Pacific region are generally healthy, however some salmon and inshore rockfish stocks are overfished and depressed. In general, groundfish stocks off the west coast of Canada are considered to be at low to average abundance, with Pacific cod and Pacific hake at very low abundance (FAO, 2005). The Committee on the Status of Endangered Wildlife in Canada, an arms-length scientific body with legal standing under Canada's Species at Risk Act, has classified four salmon

populations as endangered and bocaccio, a groundfish, as threatened, though the Canadian government has chosen not to provide those species with protection under the Act. In general, the major salmon stock complexes in Canada's Pacific are healthy with a reasonable level of stock assessment and appropriate fishery management. *Canada's Policy for the Conservation of Wild Pacific Salmon,* released by DFO in 2006 after in-depth public consultation, promises to provide strong science-based protection of salmon stocks, endorsing the precautionary principle and reduction of mixed-stock fishery effects in the Pacific region. In 2002, DFO announced a rockfish conservation strategy and cut commercial total allowable catches (TACs) by more than 50 percent, increased at-sea monitoring in the commercial sector, reduced recreational catch limits and introduced a series of rockfish conservation areas to protect spawning biomass. However, a lack of stock assessment information presents concern for a number of other groundfish species. Pacific cod and shortspine thornyhead species are of current concern, with the latter red listed by the IUCN (IUCN, 2006).

MANAGEMENT ACTIVITY

In effect, almost all major stocks or species groups are under some form of management and stock assessment in the EEZs of the Pacific northeast sub-region. These fisheries, and those within the 0-3 nm zone in Canada, are the responsibility of the federal governments, mandated by the MSA in the United States and the Fisheries Act in Canada. The level of management and stock assessment for local fisheries, those within the 0-3 nm zone and not under the MSA, in the western central Pacific is less consistent and in many cases less vigilant. Management agencies in the sub-region employ a mixture of all fisheries management tools tailored to each fishery[18].

In the EEZ of the United States, the eight regional councils[19] implement the MSA under federal oversight by developing FMPs, including: creating amendments, commenting on applications for foreign fishing, conducting public hearings, reviewing and revising stock assessments and processing activities on a continuing basis. The FMPs are subject to approval by the Department of Commerce. In addition to the federal review process, which includes an economic impact analysis, the public is invited to comment on FMPs within a regulated structure and time period. The councils are supported by technical teams, independent scientific committees, constituent advisory panels, enforcement officials, lawyers and management agencies. Local fisheries in the United States Pacific, including the Islands, are managed by coastal state and territorial governments and on the mainland three interstate marine fisheries commissions provide coordination; the NMFS assists on major problems or cross-jurisdictional issues. Management regimes for the Hawaii- and American Samoa-based longline fisheries, the United States western and central Pacific ocean purse seine fishery, the United States distant water North and South Pacific troll fisheries and the small-scale artisanal, recreational and subsistence fisheries are each different and described in the country review within this report.

Commercial fisheries in Canada's Pacific, though similar in the type of measures and management tools to those in the United States EEZ, go through a different FMP development process. FMPs are developed with stakeholders through a number of advisory processes, usually one for each species group[20]. About 30 FMPs representing all major species groups are signed off by the Minister of Fisheries and Oceans

[18] Licensing, limited entry, gear restrictions, catch monitoring, observers, vessel monitoring systems, designated landing sites, dockside monitoring, marine protected areas, open/closed times, bycatch restrictions, enforcement,

[19] Two councils, the Pacific Fisheries Management Council and the Western Pacific Fisheries Management Council, are responsible for the US Pacific and US Pacific Islands regions respectively.

[20] Canadian Pacific main species groups for purposes of management are: salmon, herring, groundfish, invertebrates and pelagics.

then publicly posted and attached to each commercial fishing licence as a way of implementing conditions of the licence. FMP development is supported by a scientific stock assessment and review process comprised of species-group committees led by DFO scientists through a series of peer-reviewed stock assessments. The stock assessments estimate sustainable yield and provide recommendations on management actions.

Vessels in Canada are licensed and each commercial harvester must have a Fisher Registration Card (licence). Day-to-day management of the fisheries is by public notice, notices to industry and orders in council. Recreational fisheries are managed by annual publication of regulations, and each angler requires an annually-issued licence. DFO supports, and receives significant and detailed advice from, a highly structured sport fishing advisory body made up of volunteers from various fishing interests. While aboriginal fishing rights continue to be shaped by the courts and treaty claim settlements, aboriginal people participate in three types of fishery: they make up about 30 percent of the open commercial fishery; they have exclusive commercial fisheries as set out in treaties; and harvest a wide variety of species for food, social and ceremonial purposes. The two latter fisheries are licensed communally.

As mentioned in the previous section, the MSA requires annual reporting of the status of stocks that indicates which species or stock groups are overfished or subject to overfishing, and what management actions will be taken in the event of overfishing. There is no comparable reporting in Canada, but the rigour of the scientific and peer-review process provides a transparent indication of potential problems for most major stocks and usually results in a public demand for action.

The trend in fisheries management in the sub-region is toward a higher level of conservation with a precautionary approach and efforts in several areas to embrace ecosystem-based management. All jurisdictions over the past ten years have increased the use of observers, introduced vessel monitoring systems (VMS) and various selective fishing techniques and incentives to reduce bycatch. For example, most of Canada's Pacific fisheries have now some level of observer coverage, many at 100 percent, complemented with dockside monitoring and logbook programs. Limited entry, vessel size restrictions, closed areas, mandatory VMS and observer coverage, seabird and turtle avoidance measures and restrictions on shark finning have been introduced to the Hawaii longline fishery since 1991. The US has made efforts to reduce fishing capacity through buy-out programs. Notably in June 2006, the President created the world's largest marine protected area — a group of remote Hawaiian islands that cover 84 million acres and are home to 7 000 species of birds, fish and marine mammals, at least a quarter of which are unique to Hawaii. A wide range of restrictions have been placed on the small-scale fisheries in the US Pacific Islands in recent time, including bans on the use of explosives, poisons and electrical devices to take fish or shellfish.

In Canada, fishing regimes have been moving toward individual quota (IQ) or individual transferable quota (ITQ) fisheries; about two thirds of the catch is now derived from IQ fisheries, with most other commercial fisheries either considering or piloting the system. The benefits have included improved conservation of fish stocks, improved catch monitoring, increased value from better prices and reduced operating and capital costs, greater industry and individual accountability, industry contribution to management costs and resource stewardship, and safer working conditions (Jones, 2003). The move in this direction tends to reduce the intensity of management and the risks of the 'race for fish' often associated with competitive fisheries.

However, there is a recognized need in most jurisdictions to improve fishery reporting and catch monitoring, or at least balance fishing effort and associated risks with the level of monitoring. This is of particular concern with respect to species of less commercial significance but never-the-less rare or endangered. Bycatch and discards of a large number of non-assessed species remains high in some fisheries.

Conflicts and disputes characterize many, if not most, of the fisheries in the sub-region, but are not unusual to capture fisheries elsewhere. Most of these conflicts stem from either inter- and intra-sector allocation issues or competing economic forces such as ocean or land-based industries that threaten fish habitat. Management agencies also often face conflicts between economic interests to harvest and those who believe fishing efforts are beyond sustainable yields. This tension may have a balancing effect in some areas, but often results in mediocre or ineffective conservation while disputes are weighed in the judiciary or the court of public opinion. The judiciary is intensively involved in fisheries management decisions in the United States where the MSA institutes detailed and transparent accountability, and less so in Canada where the Minister of Fisheries and Oceans has broad discretionary powers and the decisions are often the result of balancing interests, backed by strong public policy.

Most agencies and the regional councils are making efforts to include ecosystem-based approaches in the management of fisheries. However, the concept remains complex and subject to scientific debate; many find it difficult to arrange into decision-making frameworks. Establishment of marine protected areas and solutions to bycatch issues are examples of tools available and implemented most often in this regard, but the cross-jurisdictional nature of ecosystems, especially with respect to highly migratory and straddling stocks, frequently calls for inter-jurisdictional cooperation. Such cooperation is facilitated by instruments such as the Agreement for the Implementation of the Provisions of the Convention Relating to The Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement), but there are opportunities for increased international or regional leadership in the application of ecosystem-based management actions.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

Indications are that costs of fisheries management in all jurisdictions of the sub-region have increased in the past ten years, but appear to have leveled off, if not decreased in recent years. The overall increases are generally attributed to intensified public interest and scrutiny of management decisions and rising resource management conflicts, both resulting in rising consultation and legal costs. In Canada, enactment of the Species at Risk Act has increased stock assessment, socio-economic analysis and consultation requirements possibly not yet reflected in the current budget process

Though the NOAA Fisheries budget from 2005 to 2007 (requested amount) decreased from US$824 million to US$737 million, it has risen from US$220 million in 1992 (NOAA, 2007). Due to the complexity of overlapping programs, grants and cost recovery programs expenditures by region or State are not available except in the US Pacific Islands where the NOAA Fisheries costs in 2003 were US$ 37.3 million (NMFS/WPRFMC, 2004).

DFO fisheries management costs decreased nationally from US$301 million (US 2002 $) in 2000 to US$229 million (US 2002 $) in 2005. Beyond specific program indicators, regional costs of fisheries management in Canada are not readily available in a useful form. However, indications are that costs may have risen, reflected by a slight increase in the DFO Pacific Region's overall operational budget from US$99.9 million (US 2002 $) in 1997 to US$104.1 million (US 2002 $) in 2004 (DFO, 2004).

Cost recovery is a feature of fisheries management in all jurisdictions through a number of mechanisms that vary from licence fees to reimbursement programs between US Federal Aid programs. NOAA Fisheries pays for most of the costs of fisheries management in its jurisdiction, whereas Canada has embarked on an aggressive approach to recovering costs through some form of levy to the fishing industry, often through the use of the resource by joint agreement between DFO and a fishing organization. Most harvesters in most fisheries in Canada's Pacific region, salmon fisheries a notable exception, pay the majority of fishery monitoring costs and in some

cases research and enforcement. A 2006 court decision limited the extent to which the Minister of Fisheries and Oceans can appropriate use of fishery resource revenues to pay for fisheries management activities through agreements with fishing groups.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Canada ratified the United Nations Convention on the Law of the Sea (UNCLOS) in November 2003 and the UN Fish Stocks Agreement in August 1999. Canada also implemented the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (Compliance Agreement) by enactment of The Coastal Fisheries Protection Act in 1985.

Canada has completed one national plan of action (NPOA) under the FAO International Plans of Action instrument: to prevent, deter and eliminate illegal, unreported and unregulated fishing (IUU). Canada has also taken steps to implement a number of other International Plans of Action initiatives through regulations and management actions, including: capacity management, fishing; shark management; and, seabird bycatch in longline fisheries. In 2004, Canada joined the High Seas Task Force – an international, ministerial-level task force dedicated to the fight against illegal, unreported, and unregulated fishing activities on the high seas. Canada also tabled its NPOA-IUU at the annual meeting of the United Nations Food and Agriculture Organization (FAO) Committee on Fisheries (COFI) in Rome in March 2005. Canada signed (but has not yet ratified) the 2000 Convention on the Conservation and Management of the Highly Migratory Fish Stocks of the Western and Central Pacific Ocean, which established the Western and Central Pacific Fisheries Commission (WCPFC). The United States is also a cooperating non-member of the WCPFC.

In January 2001, Canada released a selective fishing policy (DFO, 2001) for fisheries in the Pacific region that sets out objectives and an implementation framework. The policy specifies a deadline of January 2003 for standards to be developed in consultation with stakeholders which is yet to be completed. Canada has also made significant progress on implementing measures to address seabird bycatch in longline fisheries on the Pacific coast. Mandatory seabird avoidance regulations were in place for the commercial halibut fishery and in 2003 these requirements were extended to all the commercial groundfish longline fisheries on Canada's Pacific coast.

In the mid-1990s, Canada drafted but has not yet completed, an NPOA for capacity management and determined that capacity management is managed effectively under ITQ regimes which create the incentive for participants to address fishing capacity issues to improve the economic viability of the fishery, as the less efficient operators are bought out by the more efficient ones, thereby reducing the number of active fishing vessels. For example, since introduction of the ITQ system in 1991 the fleet has reduced in size from 433 active fishing vessels to about 225 active halibut vessels in 2003.

Until recently, Canada supported an industry-led Responsible Fishing Board. The Board comprised most of the key fishing industry organizations in Canada with representatives from all parts of the country. The Board focused primarily on implementing the FAO 1995 Code of Conduct for Responsible Fishing through coordination and awareness initiatives such as an annual award recognizing individual harvesters, presented by a former Governor General of Canada. Unfortunately, the Board has become dormant in recent years, since the Canadian government withdrew financial support.

The United States has not yet acceded to the UNCLOS, but ratified the UN Fish Stocks Agreement in August 1996, and fully implemented the UN Compliance Agreement in 1996 through enacting the High Seas Fishing Compliance Act. All United States fisheries operating on the high seas are subject to the Act and its implementing regulations. The regulations include provisions for the application of five-year non-transferable High Seas Fisheries Permits, requirements for vessel identification,

requirements for the reporting of catch and effort data, including information on interactions with seabirds and sea turtles, and requirements for compliance with international conservation and management measures. In 2000 the United States also enacted the Shark Finning Prohibition Act of 2000. The United States has completed NPOAs for the Management of Fishing Capacity, IUU, Conservation and Management of Sharks, and Reducing Incidental Catch of Seabirds in Longline Fisheries. Efforts have been made to limit fishing capacity through restricted entry, ITQs in some fisheries and specific licence buy-back programs. There are also limits on vessel size in some fisheries in the US Pacific Islands and a limit on annual effort in the Hawaii-based longline swordfish fishery.

REGIONAL FISHERY BODIES

Regional Fishery Bodies (RFB) were established during the first half of the twentieth century with primarily an advisory role that now is moving toward more of a management function (FAO, 2004b). The RFBs fall into three main categories: management bodies, advisory bodies or scientific bodies. The RFBs are engaged in various levels of decision-making in relation to the international instruments discussed in the previous section, including: the precautionary approach, agreement on decision-making procedures that facilitate the adoption of conservation and management measures in a timely and effective manner, transparency in the decision-making process, decision-making procedures for dispute prevention, and strengthening decision-making to implement relevant policies (FAO, 2004b). There are also a number of other inter-jurisdictional entities carrying out activities related to or supporting fisheries management objectives in the sub-region. These entities involve economic cooperation (e.g. Asia-Pacific Economic Cooperation (APEC)), environmental/fishery arrangements and scientific arrangements (e.g. North Pacific Marine Science Organization (PICES)) (FAO, 2004b).

Within the main categories indicated above, there are five RFBs active in the northeast Pacific sub-region: the International Pacific Halibut Commission (IPHC); the Pacific Salmon Commission (PSC); the North Pacific Anadromous Fish Commission (NPAFC); the Inter-American Tropical Tuna Commission (IATTC); and the Western and Central Pacific Fisheries Commission (WCPFC). Participation by the United States and Canada varies by commission, but is either as members or cooperation non-members. Table 3 provides the level of participation and the geographic scope of each RFB, and a short description of each follows.

IPHC – The International Pacific Halibut Commission, originally called the International Fisheries Commission, was established in 1923 by a Convention between

TABLE 3
United States and Canada Participation in Key Northeast Pacific Regional Fishery Bodies

RFB	United States	Canada	Membership	Area of Competence
IPHC	F	F	Canada and US	North Pacific and Bering Sea
PSC	F	F	Canada and US	Northeast Pacific Ocean
NPAFC	F	F	Canada, Japan, Korea RO, Russian Federation and US	North Pacific Ocean and adjacent seas north of 33 degrees north
IATTC	C	C	Costa Rica, Ecuador, El Salvador, France, Guatemala, Japan, Mexico, Nicaragua, Panama, Peru, US, Vanuatu and Venezuela	Eastern Pacific Ocean
WCPFC	C	C	Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga and Tuvalu	Western and Central Pacific Ocean

Notes: F = Full Participating Member; C = Cooperating Non-Member; No Involvement = N
Source: (FAO, 2004a)

the governments of Canada and the United States[21]. Its mandate is research on and management of the stocks of Pacific halibut within the Convention waters of both nations. The IPHC consists of three government-appointed commissioners for each country who serve their terms at the pleasure of the President of the United States and the Canadian government respectively.

PSC – The Pacific Salmon Commission was formed by the governments of Canada and the United States to implement the Pacific Salmon Treaty. Interception of Pacific salmon bound for rivers of one country in fisheries of the other has been the subject of discussion between the Governments of Canada and the United States since the early part of this century[22]. In 1985, after many years of negotiation, the Pacific Salmon Treaty was signed, setting long-term goals for the benefit of the salmon and the two countries. A new agreement was signed in 1999. The Pacific Salmon Commission is a sixteen-person body with four Commissioners and four alternates each from the United States and Canada, representing the interests of commercial and recreational fisheries as well as federal, state and tribal governments.

NPAFC – The North Pacific Anadromous Fish Commission (NPAFC) was established in 1993 under the Convention for the Conservation of Anadromous Stock in the North Pacific Ocean with the primary objective of promoting the conservation of anadromous stocks in the Convention Area.[23] Conservation measures under the NPAFC include:

1. Prohibition of directed fishing for anadromous fish in the Convention Area.
2. Minimization to the maximum extent of the incidental taking of anadromous fish
3. Prohibition of the retention on board a fishing vessel of anadromous fish taken as an incidental catch during fishing for non-anadromous fish.

IATTC – The IATTC, established by international convention in 1950, is responsible for the conservation and management of fisheries for tunas and other species taken by tuna-fishing vessels in the eastern Pacific Ocean. Each member country of the IATTC is represented by up to four Commissioners, appointed by the respective governments. The IATTC also conducts scientific investigations and has significant responsibilities for the implementation of the International Dolphin Conservation Program (IDCP) and provides the Secretariat for that program.

WCPFC – The Western and Central Pacific Fisheries Commission was established to implement the Convention and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean, which came into force in June 2004. The objectives of the WCPFC are to ensure, through effective management, the long term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean in accordance with the 1982 United Nations Convention on the Law of the Sea and the 1995 UN Fish Stocks Agreement (FAO, 2004a). There have been 27 countries involved in the development of this convention, most of which are expected to become members of the Commission. The WCPFC will have some mutually agreed regulatory powers (FAO, 2006).

SUMMARY AND CONCLUSIONS

Fisheries management in the northeastern Pacific is generally sophisticated and modern. It is driven in each nation by strong federal-level legislation, supported by robust Pacific fishery management councils (in the United States). Strong scientific stock assessment is applied to key target stocks, but there are gaps in assessment of many low-value bycatch species. A number of effective regional fishery bodies

[21] Source: IPHC website: http://www.iphc.washington.edu/halcom/about.htm
[22] Source: PSC website: http://www.psc.org/
[23] The waters of the North Pacific Ocean and its adjacent seas, north of 33 degrees North Latitude beyond 200-miles zones of the coastal States.

harmonize national fisheries regulations and improve management at the regional level and in high seas areas. The objectives of global mandates and agreements are generally respected and pursued in the sub-region, at least in intent if not by ratification and legislative incorporation.

The United States' fisheries management regime is characterized by transparency in decision making, often expressed in judicial resolution of disputes, with the MSA prescribing a strong policy framework and public accountability. Canada's fisheries management regime is transparent and accountable, but disputes other than those involving aboriginal rights tend to be resolved politically rather than judicially, which may appear to some to be a step removed from the level of public debate in the United States. Canada relies on public policies and stakeholder advisory mechanisms to inform and guide fishery operations. An example contrasting differing approaches between the two countries with respect to transparency resides in the reporting on the status of stocks. Mandated by the MSA, NOAA provides a detailed report to Congress annually, whereas Canada has no comparable reporting mechanism, but instead relies on scientific stock assessments for specific species or species groups.

Canada is pursuing cost recovery and fishery co-management arrangements with more vigour than the United States where agencies tend to fund most of the management and enforcement costs. Both nations, especially Canada, are moving toward implementation of ITQs in fisheries to foster improved efficiencies, conservation incentives and capacity management.

Though the majority of fish stocks in the sub-region are healthy and under some form of management, almost all species groups in the sub-region are fully subscribed with many stocks considered depleted, overfished or subject to overfishing. Concerns are raised and attention is drawn to inadequate fishery monitoring, catch reporting and enforcement in all areas of the sub-region. The local fisheries of the Pacific US Islands perhaps stand out this regard, the recreational fishery of Hawaii in particular. Fishing vessel monitoring in the sub-region, though increasing in some areas, needs to be increased, either through observer programs or VMS. Interestingly, this is a feature that often accompanies IQ fisheries, and is supported by harvesters as much for catch accounting as for other benefits.

The RFBs in the sub-region generally have strong conservation mandates and are committed in most cases to implementing global laws and agreements. However, too often encumbrances to these objectives are the conflicts between fishing sectors and between management agencies and other economic interests. This plays out with most intensity over fish habitat protection in both the freshwater nursery and marine environments.

Finally, the management of fisheries in the sub-region would benefit from stronger efforts toward ecosystem-based management. Both nations are committed to establishing marine protected areas as an important tool in protecting whole ecosystems. Canada's Rockfish Conservation Strategy and its establishment of rockfish conservation areas and the Northwestern Hawaiian Islands Marine National Monument, now the world's largest marine protected area created by the US President in June 2006, both provide strong leadership in this regard. However, for the most part, single-stock management typifies most fisheries and the RFBs have in most cases a single species or specialized mandate. The regional councils in the United States, and perhaps the WCPFC, are well positioned to play important roles in implementing ecosystem concepts.

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