

The legal context of United States fisheries management and the evolution of rights-based management in Alaska

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1. LEGAL CONTEXT OF UNITED STATES FISHERIES MANAGEMENT

1.1 Overview

Fisheries in the United States are governed under a composite of overlapping federal, multi-state, state, and tribal authorities and are conditioned by treaties and compacts. In general, individual states have jurisdiction over fisheries in lakes, streams, and rivers within state boundaries, and in marine waters within three miles of their coast. For Texas and the Gulf of Mexico coast (i.e. the west coast) of Florida, state jurisdiction extends to nine miles. Before 1976, federal jurisdiction included fisheries in lakes, streams and rivers within federal lands and in waters from three to twelve miles (or nine in Texas and Florida) offshore. That authority was extended to 200 miles pursuant to the *Magnuson Fisheries Conservation and Management Act of 1976* (renamed *the Magnuson-Stevens Fisheries Conservation and Management Act*, MSFCMA, in the 1996 reauthorisation). Multi-state compacts, such as the Atlantic States Marine Fisheries Commission, the Gulf States Marine Fisheries Commission and the Pacific States Marine Fisheries Commission, coordinate state management of shared stocks of migratory species. Subsistence, sport, and commercial fisheries in lakes, streams, and rivers that flow through or abut certain tribal lands are governed under treaties negotiated with indigenous peoples. In addition, the management of some fisheries operates within bounds established under international treaties.

The exercise of federal, state, multi-state and indigenous authority occurs through the interplay of: statutes passed by state and federal legislative bodies; regulations promulgated by federal, state, regional and local executive bodies; common law precedents that evolve through state and federal judiciary processes; treaties approved by Congress; and state and federal constitutions. This chapter will touch briefly on common law and constitutional provisions before focusing more intensely on the principle statutes and regulations that govern fisheries in the US Exclusive Economic Zone (EEZ). This chapter will also review the fisheries management framework in Alaska, as several of the cases in this volume occur in Alaska.

1.2 Common law

Bader (1998) describes common law as:

“... the product of courts resolving conflict among individuals by relying on local standards of reasonable conduct and expectations. Once a decision is made, the decision serves as precedent for purposes of analogy in subsequent controversies.”

In the US and other nations that derive legal traditions from the Magna Charta, common law forms the basis for the creation and enforcement of private contracts and the identification of remedies for nuisances and torts. Of particular importance to fisheries are precedents governing property and a concept called the Public Trust Doctrine.

Property law is important to fisheries because it specifies the conditions of ownership, the suite of entitlements and liabilities that derive there from, and how those rights and obligations are distributed between individuals, groups and government (Honoré, 1961). Property law is the governing basis for fishery management regimes we label open-access, regulated open-access, common-property, territorial use rights, community development quotas, limited access privileges, individual fishing quotas, private property and so forth.

The Public Trust Doctrine can be characterized as a common law caution regarding the alienation of public resources (NRC, 1999). For example, in *Illinois Central R.R. Co. v. Illinois* (1892), the U.S. Supreme Court found that title to certain public resources is:

“... a title held in trust for the people of the States that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties.

... The State can no more abdicate its trust over property in which the whole people are interested, like navigable waters and the soils under them, so as to leave them entirely under the use and control of private parties than it can abdicate its police powers in the administration of government and the preservation of the peace.”

While *Illinois Central R.R. Co. v. Illinois* (1892) does not prohibit alienation of navigable waterways, submerged lands or living aquatic resources (Simmons, 2007), it does suggest that alienation is permissible only when the public interest or public use is improved thereby or when alienation does not substantially impair the public interest or the use of remaining resources (NRC, 1999). Consequently, when the right to harvest fishery resources is conveyed to individuals, the government typically retains a trust responsibility for safeguarding the sustainability of those resources (McCay, 1998).

1.3 Federal Constitutional law

Bader (1998) suggests that federal authority in fisheries management is established in the property clause (*Art. 4, Sec. 3*), the commerce clause (*Art. 1, Sec. 8*), and the treaty clause (*Art. 2, Sec. 2*) of the US Constitution. Under the property clause, the federal government has authority to control the use of federal lands and associated resources. This authority extends to fugitive resources that stray from federal lands and to actions on state or private lands that impinge on federal resources. Under the commerce clause, any activity that could potentially affect interstate commerce is subject to Congressional oversight. Movements of fish across state boundaries or from federal waters represent activities that lie within the scope of the commerce clause. The power of Congress to enact treaties represents another federal authority that is superior to the authority of states and tribes.

Both states and tribes derive authority from, and are limited by, US Constitutional provisions. The federal constitutional authority of states is primarily embodied in their police powers, powers that give the state authority to control the use of state lands and associated resources. This authority extends to fugitive resources that stray from state lands and actions on private lands that impinge on state resources. Interstate compacts are delegations of state authority over particular resources to better account for transboundary characteristics of those resources. While compacts can be formed from the bottom-up, as in the example of the Atlantic States Marine Fisheries Commission, they can also be established by Congress and imposed on the states. Bader (1998) characterizes the regional Fishery Management Councils established

under the MSFCMA as compacts imposed on the states and moderated by the federal government. The constitutional authority of tribes lies in their status as dependent sovereigns with authority to regulate non-member access to resources on tribal lands and in their authority to regulate resource uses off tribal lands that might impact tribal resources.

Bader (1998) notes that individuals also hold constitutional rights that relate to fisheries management. For example, the US Constitution prohibits states from discriminating against citizens of other states. While non-residents may be charged higher fees for access to resources, the fee differential must be founded on real differences in the cost of management or in the relative contribution of taxes and fees to the cost of management. The takings clause is an additional constitutional provision that protects private ownership interests once those interests have been established, for example, through capture.

1.4 Statutes, regulations, and common and constitutional law at the state level

Use of fishery resources within each US state is governed under the provisions of a state constitution, coupled with statutes, regulations and common law precedents. These laws differ widely among the states. For example, Virginia law allows for submerged lands to be leased for oyster culture while Maryland law does not. Providing an overview of the organisation and governance of fisheries in each of the fifty states is beyond the scope of this chapter. However, because several cases in this volume arise in Alaska, Alaskan institutions are discussed in much greater detail below. The Alaskan context illustrates how management regimes at the federal and state level interact in the American policy context.

1.5 Federal statutes and regulations

The general relationship between statute and regulation is that regulations are written by the executive branch to implement statutes passed by the legislative branch. Thus, while regulation can have an important role in the operation of fisheries, legislative statutes set the boundaries within which regulations are written. Key federal statutes that affect US fisheries management include the MSFCMA, the *National Environmental Policy Act* (NEPA), the *Endangered Species Act* (ESA) and the *Marine Mammal Protection Act* (MMPA). In addition to these major legislative acts, there are numerous acts, regulations, and treaties that address management aspects of fisheries for particular species, regions and fleet components.

The MMPA requires an examination of adverse impacts that proposed actions might have on populations of marine mammals and also requires consideration of mitigating regulations. The ESA requires the conservation of listed species. Compliance with this requirement is monitored through Section 7 consultations to determine if proposed actions would adversely affect the listed species or adversely modify critical habitat. NEPA requires an evaluation of possible environmental consequences of proposed actions to inform decision-making processes.

While NEPA, ESA, MMPA and miscellaneous other legislative acts and derivative regulations have important roles in the management of US fisheries, the MSFCMA and associated regulations provide the principal basis for fisheries governance in the US EEZ. The MSFCMA may also find application in state waters, through the deference accorded to federal law when state law interferes with federal purposes, such as interstate commerce or management of federal resources. The MSFCMA asserted authority for management of fishery resources in the US Exclusive Economic Zone (EEZ), delegated that authority to the Secretary of Commerce, and created a system of regional Fishery Management Councils (FMCs) that are responsible for preparing Fishery Management Plans (FMPs) for living marine resources subject to directed fishing.

2. MAGNUSON-STEVENS FISHERIES CONSERVATION AND MANAGEMENT ACT

The MSFCMA creates eight regional FMCs, which have much of the authority to determine how the Act will be implemented for individual fisheries. Officially, the FMCs advise the Secretary of Commerce, who is responsible for promulgating final rules and implementing and enforcing those rules. However, the Secretary is constrained legally (and to an even greater extent, politically) to give great deference to the plans submitted by the FMCs. Generally, the Secretary must implement the recommendations of the FMCs unless those recommended plans fail to meet specific provisions of the MSFCMA. The Secretary has the authority to implement “Secretarial plans” if FMCs fail to act.

The eight regional FMCs established under the MSFCMA are:

- i. New England (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut);
- ii. Mid-Atlantic (New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina);
- iii. South Atlantic (North Carolina, South Carolina, Georgia, and Florida);
- iv. Gulf of Mexico (Florida, Alabama, Mississippi, Louisiana, and Texas);
- v. Caribbean (Puerto Rico and US Virgin Islands);
- vi. Western Pacific (Hawaii, American Samoa, Guam, Northern Mariana Islands, and US Pacific island possessions);
- vii. Pacific (California, Oregon, and Washington) and
- viii. North Pacific (Alaska).

FMCs have varying number of voting members. Representation on FMCs may include states from outside the governed region. For example, the North Pacific FMC has voting members from Washington and Oregon. Voting members of the FMC include:

- i. Each designated state has an official representative of the state agency responsible for marine resource management;
- ii. Each designated state has one or more public members. The governors of designated states nominate candidates, who are then chosen by the Secretary of Commerce. Most of these public members have clear affiliations with commercial or recreational fishing interests, although a few have academic, environmental, or other non-fisheries affiliations;
- iii. A representative of the National Marine Fisheries Service (NMFS, a division within the federal National Oceanographic and Atmospheric Administration); and
- iv. In the case of the Pacific FMC, a tribal representative.

There are also a number of non-voting members to each FMC, including representatives of: interstate fishery commissions, other FMCs, the US Coast Guard, the US Fish and Wildlife Service and the US State Department. Nationwide, the composition of recent (2004–2007) voting FMP memberships has been: 37 percent state or federal fisheries agency representatives, 30 percent commercial sector, 24 percent recreation sector and 9 percent other (DOC, 2007; MSFCMA, 2007).

Although there is some variation across the FMCs, each of the eight FMCs is advised by one or more advisory panels composed of stakeholders representing commercial and recreation fishing interests and conservation and civic organizations. The FMCs are also advised by scientific and statistical committees (SSC) composed of research scientists drawn from state and federal research labs and universities. Under the current version of the MSFCMA, the SSC’s role in determining limits for acceptable biological catches (ABCs) and overfishing levels has been strengthened, such that the FMCs are constrained to set total allowable catch limits (TACs) that are at or below the ABCs established by the SSC. This has been the standard operating procedure in the North Pacific Fishery Management Council and has been identified as an important factor

TABLE 1
National Standards for Fishery Conservation and Management

1	Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.
2.	Conservation and management measures shall be based upon the best scientific information available.
3.	To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.
4	Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (a) fair and equitable to all such fishermen; (b) reasonably calculated to promote conservation; and (c) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.
5.	Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
6.	Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.
7.	Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.
8.	Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.
9.	Conservation and management measures shall, to the extent practicable, (a) minimize bycatch and (b) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.
10.	Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Source: MSFCMA (2007) Section 301.

in the successful management of fisheries off Alaska (Pew Oceans Commission, 2003; Witherell, 2005).

Section 301 of the MSFCMA identifies ten national standards for fishery conservation and management (see Table 1). With minor modification, these ten standards have been in force throughout the period in which the US cooperatives described in this book were being developed and implemented. While all ten standards have influenced the structure and operation of US cooperatives, the fourth standard is particularly important. The fourth standard stipulates that conservation and management measures must be non-discriminatory with respect to residents of different states, and that allocation of fishing privileges must be motivated by conservation goals, must be fair and equitable to US fishermen, and must not permit the excessive concentration of ownership.

Section 303A, added to the MSFCMA in the latest reauthorisation in 2006, introduces a suite of conditions that govern the creation and operation of Limited Access Privilege (LAP) programmes. As defined in the MSFCMA, LAP programmes include IFQs and limited entry programmes such as the pollock cooperatives described in this volume (Wilen and Richardson, 2007; Paine, 2007). Of particular import are the stipulations that LAPs created, implemented, or managed under the MSFCMA can be modified or revoked without compensation to rights-holders. In addition, the new MSFCMA specifies that LAPs are issued for a period of not more than 10 years, but will be renewed unless their use has not complied with FMP requirements. LAP programmes are to be reviewed within five years of implementation and at least once every seven years thereafter. In addition and in a departure from previous versions of the MSFCMA, the current version specifically permits the use of auctions as a mechanism for accomplishing initial or subsequent allocations of LAPs. To avoid disruption, existing LAP programmes – specifically including the cooperatives authorized under the American Fisheries Act (AFA) – and programmes on the verge of being implemented are exempted from most of the requirements of section 303A.

The MSFMCA has included a number of provisions that either apply only to the North Pacific FMC (NPFMC) or were intended primarily for use by the NPFMC. This reflects a number of unique characteristics of Alaska. Alaska is geographically separated from the continental US. Fisheries have much greater importance in Alaska than in any other state. Alaskan Congressional members, and notably Senator

Stevens, have been active in US fisheries policy. Important examples of Alaska-specific legislation include pollock cooperatives under the *American Fisheries Act of 1998* and the Bering Sea Aleutian Islands crab provisions of the 2006 MSFCMA reauthorisation bill. Both are discussed below.

3. THE EVOLUTION OF RIGHTS-BASED MANAGEMENT IN ALASKA

3.1 Overview

Alaskan fisheries policy is an interwoven matrix of federal and state policies. This interdependence is more pronounced than in most other states. Again, this is due to the unique relation of Alaska to fisheries and Alaska to the rest of the US.

Milestones in the management of Alaskan fisheries include:

- i. 1868, when Alaska was purchased from Russia,
- ii. 1959, when Alaska gained statehood,
- iii. 1972, when the *License Limitation Act* was passed by the Alaska state legislature, and
- iv. 1976, when the MSFCMA was passed.

Prior to the Alaska purchase and throughout most of the 19th century, fisheries off Alaska were primarily subsistence fisheries that supported food and trade needs of Alaska's native population. These early fisheries were primarily focused on salmon (*Oncorhynchus* sp.), herring (*Clupea pallasii*), hooligan (*Thaleichthys pacificus*, also known as Eulachon smelt), and halibut (*Hippoglossus stenolepis*).

The late 1800s saw the development of a salt-cod (*Gadus macrocephalus*) fishery in the Gulf of Alaska and Aleutian Islands, development of salmon canneries in proximity to major salmon-producing rivers, and the development of a commercial fishery for halibut. The halibut fishery was brought under an overall quota management structure under the Halibut Convention of 1923. Throughout the first half of the 20th century, salmon production and management was largely devolved to the canneries. Concern about the economic power of the canneries was an important factor in the petition for statehood. Thus, in the immediate aftermath of statehood, the use of salmon traps was prohibited and canneries were faced with a necessity of purchasing catches from fleets of small fishing boats.

From the mid-1950s to the mid-1970s, distant water fleets from Japan, Russia, Korea and Eastern Europe began to focus ever-increasing effort on stocks of walleye pollock (*Theragra chalcogramma*), yellowfin sole (*Pleuronectes asper*) and other shelf flatfish species, Pacific ocean perch (*Sebastes alutus*), sablefish (*Anoplopoma fimbria*), and herring in the eastern Bering Sea. In contrast with the groundfish fisheries, the crab fisheries that developed in the 1960s were dominated by domestic vessels. High-seas drift-gillnet fisheries for salmon flourished from the mid-1950s through 1978, when they were prohibited by treaty. Foreign vessels were banned from fishing within the three-mile territorial waters in 1964, and in 1966, they were restricted to operating under fishing permits in waters from three to twelve miles offshore. As discussed above, these management claims were extended to 200 miles in 1976 with passage of the MSFCMA.

The Alaska Constitution (Article VIII) contains three important sections that govern fisheries policy:

- i. *Section 3*. "Wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use."
- ii. *Section 4*. "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses."
- iii. *Section 15*. "No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State. This section does not restrict the power of the State to limit entry into any fishery for purposes of

resource conservation, to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State.”

Together, these sections have been interpreted in the courts as strong limitations on the degree to which the State can issue exclusive licenses. These limitations have been interpreted to set lower bounds on the minimum number of permits that can be included in limited entry fisheries and to prohibit the issuance of individual fishing quotas in state fisheries. Macinko (1993) and Bader (1998) characterize these sections of the Alaska Constitution as constitutional affirmation of the application of the Public Trust doctrine to state fisheries. These state constitutional provisions have had an important role in shaping the structure of the Chignik co-op (see Knapp, this volume).

3.2 Salmon management

By the late 1960s, Alaska's salmon fisheries were the scenes of intensive competitive fisheries. Similar conditions in British Columbia and the Pacific Northwest led Christy and Scott (1965) and Gulland and Robinson (1973), among others, to suggest the adoption of licence limitation as a means of stabilizing fishery revenues and improving management. Alaska legislators acted on these recommendations and passed the *License Limitation Act* in 1972, establishing the Commercial Fisheries Entry Commission (CFEC) within the Alaska Department of Fish and Game (ADF&G). The CFEC quickly introduced licence limitation programmes in salmon and herring fisheries throughout the state and then extended licence limitation programmes to a variety of shellfish fisheries. Because limited entry licences were found to be use privileges that could be acquired through market transaction and because the number of permits issued in each fishing zone was motivated by conservation and was not “overly” restrictive, the Alaska Licence Limitation programme was not found to violate Article VIII of the Alaska constitution (Bader, 1998). However, in Alaska as elsewhere, licence limitation failed to provide the expected stability. The number of platforms was limited, but their fishing power was not. These shortcomings are documented in, among others, Rettig and Ginter (1978), Adasiak (1979), Fraser (1979), Pearse and Wilen (1979) and Wilen (1979).

Despite the intensive derby character of Alaska's principal salmon fisheries, ex-vessel revenues and the price of limited entry permits soared through the late 1980s. Since then, and despite continuing strong catches, ex-vessel revenues and limited entry permit prices have tumbled to about 20 percent of their peak values (Herrmann, 1994; ADF&G, 2007). In 1980, the world salmon supply was around 0.5 million tonnes, with 98 percent coming from capture fisheries. By 2001, the world supply had more than quadrupled, with 62 percent coming from salmon farms (Knapp, Roheim and Anderson, 2007). That this increase in salmon aquaculture production is the leading cause of that decline in prices has been thoroughly documented in, among others, Herrmann (1993), Herrmann, Mittelhammer and Lin (1993), Asche, Bremnes and Wessels (1999) and Knapp, Roheim and Anderson (2007). While Alaska's salmon fisheries have been well managed from the perspective of biological productivity, they have been grossly mismanaged from the perspective of economic value. Indeed, to those unfamiliar with the spendthrift incentives of the race-for-fish, it begs comprehension to learn that Alaska's salmon capture fisheries fail to generate rents comparable to those generated in salmon aquaculture, where feed and smolt costs alone are over \$1.50/kg round weight (Bjørndal, 2002).

The financial turmoil occasioned by declining ex-vessel prices and permit values resulted in numerous bankruptcies and debt restructuring and reduced participation in some fisheries. Responses included efforts to improve fish handling to increase product quality, increased marketing activity, and the extension of federal crop insurance programmes to capture fisheries (Greenberg *et al.*, 2004; Herrmann *et al.*, 2004). These financial challenges also prompted interest in the development of an LAP programme

that would be consistent with Article VIII of the Alaska constitution. The Chignik salmon cooperative, described in this volume, was the first test case. Despite financial success in its first year of operation, the Chignik salmon cooperative failed to withstand judicial review as initially organized. The cooperative has been re-organized to address judicial concerns, but doing so may have reduced its functionality.

3.3 Bering Sea and Aleutian Islands Pollock

Americanisation policies and vessel loan subsidies included in the MSFCMA caused the Alaskan groundfish fisheries to change from being almost exclusively foreign prior to 1976, to being almost entirely joint venture by the mid-1980s, and to fully domestic by 1990. By 1991, when the first of a sequence of allocation battles erupted in the NPFMC, it was estimated that there was enough harvesting capacity in the Bering Sea and Aleutian Islands (BSAI) groundfish fisheries to harvest more than double the TAC and that there was about one-and-a-half times the needed processing capacity (NPFMC, 1991). In this first groundfish allocation battle, the NPFMC established a directed fishing allocation between inshore (catcher vessels that delivered to shore-based processors) and offshore (catcher-processors, catcher vessels that deliver to catcher-processors, and motherships) and created the community development quota (CDQ) programme. The CDQ programme was initially allocated 7.5 percent of the pollock quota for use in economic development by qualifying western Alaskan communities (NRC, 1998). (The CDQ programme was the “price” for a key swing vote for the inshore sector and was not vigorously opposed by the offshore sector because it was anticipated that the offshore sector would lease the CDQ shares from the CDQ organizations.)

The inshore-offshore allocation was revisited again in 1995, with a reduction in the offshore quota and increases in the inshore and CDQ quotas (NPFMC, 1995). In 1996, the Council belatedly adopted a moratorium on entry to the BSAI groundfish fisheries. Despite these measures, harvesting and processing power continued to expand under the stimulus of the race for fish. Between 1994 and 1998, half of the catcher-processors operating in the BSAI underwent bankruptcy or forced sale of their vessel holdings (APA, 1999).

The inshore-offshore allocation issue resurfaced in 1998 (NPFMC, 1998). While the NPFMC was locked in the inshore-offshore allocation battle, representatives of the catcher-processor fleet led a delegation that included representatives of the high-seas catcher boat fleet, the mothership fleet, and the inshore fleet to seek a Congressional resolution to the interminable allocation issues for the fishery. That catcher-processor fleet had experience with the creation of cooperatives in the Pacific whiting (*Merluccius productus*) fishery off Oregon and Washington and sought an opportunity to apply that approach in pollock. The result was passage of the *American Fisheries Act (AFA) of 1998*. As initially drafted, the AFA was intended to disallow participation in Alaskan fisheries by certain catcher-processors that had been extensively rebuilt outside the US. The political process delivered a final bill that has fundamentally restructured regulation of the pollock fishery. The AFA created a limited entry programme for the BSAI pollock fishery and specified sector allocations for catcher-processors, motherships, catcher-boats that deliver to shore-based processors and catcher-boats that deliver to catcher-processors. The statute also set parameters for the formation of cooperatives within sectors, provided funds to buy out nine of the twenty-nine catcher-processors then operating and increased the quota share allocated to the Community Development Quota (CDQ) programme. Sector allocations before and after implementation of the AFA are reported in Table 2.

The sector allocations allowed members of a sector to decide whether to cooperate under terms specified by the AFA or to compete in a race-for-fish within the limits of the sector allocation. Faced with the choice of cooperative and non-cooperative

TABLE 2
Allocation of pollock TAC before and after implementation of the AFA

	1998	1999
	%	
Bycatch set aside	~5	~4.7
Community Development Quota programme	7.5	10.0
Catcher-boats that deliver to shore-based processors	30.6	42.7
Motherships	8.8	8.5
Catcher-processors	45.2	31.2
Catcher-boats that deliver to catcher-processors	3.0	2.9

Source: NPFMC (2002).

solutions, all four sectors quickly organized under civil contracts that created sub-sector allocations to each firm (Criddle and Macinko, 2000). The nine companies that control the 20 AFA-authorized catcher-processor vessels formed the Pollock Conservation Cooperative. Owners of the seven catcher-boats that had mostly delivered their catches to catcher-processors formed the High Seas Catchers' Cooperative and leased their entire sector allocation to the PCC. The remaining sectors were allowed to form cooperatives as early as January 2000 and did so.

NPFMC (2002) reports that the AFA has resulted in higher utilization rates, increased economic returns, reduced bycatch, improved management precision, and helped industry accommodate changes in fishing seasons and areas required to conserve Steller sea lions. NPFMC (2002) concludes, "The AFA has been largely successful in achieving its goals".

How the AFA cooperatives may have affected the relative economic position of shore-based processors versus their catcher vessels has been an important issue. Matulich, Sever and Inaba (2001) explore the opportunity for catcher-boat cooperatives to expropriate rent from shore-based processors. They conclude that while the AFA is likely to increase overall benefit, it may be disadvantageous to shore-based processors. Felthoven (2002) reports that technical efficiency and capacity utilization increased in the wake of AFA for actively operated catcher-processors. This debate over the relative impact on harvesters and processors probably influenced the Bering Sea crab rationalisation programme (see Section 3.6).

3.4 Halibut and sablefish management

An important part of the political dynamics that led to the AFA is explained by the development and implementation of the halibut and sablefish individual fishing quota (IFQ) programme. The abundance of halibut off the Washington, British Columbia, and Alaska declined rapidly in the late-1950s through the mid-1970s. This decline was largely a consequence of foreign catches outside US and Canadian territorial waters. Once the US and Canada asserted exclusive management authority within their respective EEZs, it was possible to rebuild the halibut stock. However, while stock rebuilding was successful and commercial catches increased, the number of fishing vessels also increased and the season length went from over 100 days to as little as 2 days in the main fishing zones. This heated race for fish reduced quality and suppressed market development, prevented rationalization of capital investments, decreased safety and increased the likelihood that catch limits would be exceeded.

Pautzke and Oliver (1997) provide a detailed history of NPFMC actions in the halibut fishery. In brief, from its inception in 1976, the NPFMC began to consider the design of a LAP programme for the halibut and sablefish fisheries. After several abortive attempts, an IFQ programme was recommended by the NPFMC in 1991, approved by the Secretary of Commerce in 1993, and implemented in 1995. The North Pacific halibut and sablefish IFQ programme has been amended to change provisions on consolidation, leasing and to allow community ownership of quota shares. These changes have had little effect on quota shares or quota share value.

As in pollock, the impact on processors has been an issue for the halibut and sablefish IFQ. In the wake of implementation of IFQs, Matulich, Mittelhammer and Reberte (1996), Matulich and Sever (1999) and Matulich, Sever and Inaba (2001) identified theoretical conditions under which processors could be disadvantaged under an IFQ programme. Matulich and Clark (2003) subsequently estimated that the processing sector had indeed been adversely impacted by the halibut-sablefish IFQ programme. Based on a more detailed model of halibut markets, Herrmann and Criddle (2006) determined that the processing sector garnered about 10 percent of the increased value associated with the transition to IFQs while the vessel owners who received the LAPs garnered about 90 percent of the increased value.

The impact of a growing sportfishing catch of halibut on commercial TACs is an unresolved issue. Commercial fishers have been concerned that unchecked expansion of the sport fishery would reduce commercial quotas and the asset value of the IFQ. These concerns have been realized, particularly in southeast Alaska, where the charter-based sportfishing catch exceeded its Guideline Harvest Limit (GHL) by 47 percent in 2006. Concerns about the likely inefficacy of GHL management led the Council to approve an IFQ programme for the charter sector even before the GHL was implemented (NPFMC, 2001). These IFQs were to have been issued to sportfishing charters and would have been transferable between the sportfishing charter and commercial fisheries under conditions intended to provide some stability to both sectors. However, in December 2005, the NPFMC rescinded its approval of the charter IFQ programme. The delayed preparation of regulations raised Council concern over legal and political fallout if an IFQ allocation were based on the original September 2000 control date (NPFMC, 2005). The NPFMC has initiated another analysis of long-term management strategies (including IFQs) for the charter-based sport sector.

3.5 Bering Sea and Aleutian Islands crab rationalisation

Since their inception in the 1960s, the Bering Sea and Aleutian Islands (BSAI) crab fisheries have been largely domestic. Within-season management of the BSAI crab fishery has been largely delegated to the Alaska Department of Fish and Game (ADF&G), which has sought to control catch and stabilise crab populations through minimum size restrictions, prohibitions on the retention of female crab and varying season length. Under size-sex-season management, season length became increasingly compressed during the 1980s. Managers introduced limits on the number of pots (baited traps) per vessel for the principal stocks and also “super-exclusive” areas for several minor crab stocks (Greenberg and Herrmann, 1994; Natcher, Greenberg and Herrmann, 1996; Herrmann, Greenberg and Criddle, 1998; Criddle, Herrmann and Greenberg, 2001). Vessels fishing for crab in super-exclusive areas were forbidden from fishing for crab in other areas. Season compression is particularly problematic in the crab fisheries, because the fisheries occur in the winter in hazardous fishing conditions that can be compounded by the race-to-fish within short seasons. Because crab must be processed live, as the number of crab fishing vessels increased, processors also increased their capacity.

Section 313(j) of the 2006 MSFCMA reauthorisation authorised implementation of the BSAI crab rationalisation programme. The BSAI crab rationalisation programme (NPFMC, 2004) includes harvest quota shares issued to fishing vessel owners and to skippers and processing quota shares issued to shore-based and floating processors. It also includes provisions to encourage the formation of cooperatives among harvesters.

A change from a race-to-fish regime to an individual quota regime invariably alters the value of harvesting capital, processing capital, human capital, infrastructure and derivative economic activities (NRC, 1999). The possibility of processor consolidation also raised serious concerns about employment losses in rural Alaska communities with

few alternative shore-based employment opportunities. Experiences in the pollock and halibut fisheries increased awareness of these potential gains and losses. The BSAI king (*Paralithodes camtschaticus*) and Tanner crab (*Chionoecetes spp.*) LAP responds to these concerns by creating processor quota as well as harvester quota. The programme also includes provisions to encourage the formation of cooperatives among harvesters, specifies an arbitration structure for settling ex-vessel price and allows communities to block the transfer of processing quota shares (MSFCMA section 313(j), NPFMC, 2004). Initial analysis suggests that there has been considerable consolidation of fishing capacity and increased ex-vessel net revenues, but little consolidation of processing capacity and insufficient information to determine whether there has been a significant change in processor net revenues (NPFMC, 2007; Matulich, 2007).

4. DISCUSSION

The Alaskan experience with management of salmon, halibut/sablefish, pollock and BSAI crab illustrates the interdependence of fisheries governance institutions in the US. There are fisheries primarily under state regulation (such as salmon), fisheries with considerable shared jurisdiction (such as crab), and fisheries primarily under federal jurisdiction (such as halibut/sablefish and pollock). But the political interconnections are stronger than the *de jure* interrelationships. Through membership on the NPFMC, Alaskans are able to strongly influence the implementation of regulation under the MSFCMA. Alaskan politicians have been successful in adding to the MSFCMA provisions that apply specifically to Alaskan fisheries. While these interdependencies are perhaps greater in Alaska than in other states, similar forces function across US fisheries governance.

5. LITERATURE CITED

- Adasiak, A. 1979. Alaska's experience with limited entry. *Journal of the Fisheries Research Board of Canada* 36:770-782.
- Alaska Department of Fish and Game (ADF&G). 2007. <http://www.cf.adfg.state.ak.us/geninfo/finfish/salmon/salmon_catch.php>
- Alaska State Constitution. <<http://ltgov.state.ak.us/constitution.php>>
- American Fisheries Act of 1998 (AFA). Public Law 105-277. In: 16 USC 1801 *et seq.*
- Asche, F., Bremnes, H. & Wessels, C. 1999. Product aggregation, market integration, and relationships between prices: application to world salmon markets. *American Journal of Agricultural Economics* 81: 588-581.
- At-sea Processors Association (APA) 1999. *Preliminary Assessment of the Pollock Conservation Cooperative*. At-sea Processors Association, Seattle, WA.
- Bader, H. 1998. *Who has the Legal Right to Fish? Constitutional and Common Law in Alaska Fisheries Management*. University of Alaska Sea Grant, Fairbanks, AK. 28p.
- Bjørndal, T. 2002. The competitiveness of the Chilean salmon aquaculture industry. *Aquaculture Economics and Management* 6: 97-116.
- Christy Jr., F. T. & Scott, A.D. 1965. *The Common Wealth in Ocean Fisheries: Some Problems of Growth and Economic Allocation*. Johns Hopkins University Press. Baltimore, MD.
- Criddle, K.R. & Macinko, S. 2000. A requiem for the IFQ in US fisheries? *Marine Policy* 24: 461-469.
- Criddle, K.R., Herrmann, M & Greenberg, J.A. 2001. Territorial use rights: a rights based approach to spatial management. In M. Dorn, S. Hills, G. Kruse and D. Witherell (eds.) *Spatial Processes and the Management of Fish Populations*. Alaska Sea Grant, Fairbanks AK. pp. 573-590
- Endangered Species Act of 1973 (ESA). In: 16 USC 1531 *et seq.*
- Felthoven, R. 2002. Effects of the American Fisheries Act on capacity, utilization, and technical efficiency. *Marine Resource Economics* 17:181-205.

- Fraser, G.A. 1979. Limited entry: experience of the British Columbia salmon fishery. *Journal of the Fisheries Research Board of Canada* 36:754-763.
- Greenberg, J.A., Herrmann, M., Hammel, C. & Geier, H. 2004. The application of farm programmes to commercial fisheries: the case of crop insurance for the Bristol Bay commercial salmon fisheries. *Journal of Agribusiness* 22 (2): 175-194.
- Greenberg, J.A. & Herrmann, M. 1994. Pot limits in the Bristol Bay red king crab fishery: an economic analysis. *North American Journal of Fisheries Management* 14: 307-317.
- Gulland, J.A & Robinson, MA. 1973. Economics of fishery management. *Journal of the Fisheries Research Board of Canada* 30: 2042-2050.
- Herrmann, M. 1993. Using an international econometric model to forecast Alaska salmon revenues. *Marine Resource Economics* 8(3): 249-271.
- Herrmann, M. 1994. The Alaska salmon fishery: an industry in economic turmoil. *Journal of Aquatic Food Product Technology* 3(3): 5-22.
- Herrmann, M., Greenberg, J.A. & Criddle, K.R. 1998. Proposed pot limits for the Adak brown king crab fishery: a distinction between open access and common property. *Alaska Fishery Research Bulletin* 5: 25-38
- Herrmann, M. & Criddle, K.R. 2006. An econometric market model for the Pacific halibut fishery. *Marine Resource Economics* 21:129-158
- Herrmann, M., Greenberg, J. A., Hamel, C. & Geier, H. 2004. Extending the federal crop insurance program to commercial fisheries: the case of Bristol Bay, Alaska salmon. *North American Journal of Fisheries Management* 24: 352-366.
- Herrmann, M., Mittelhammer, R.C. & Lin, B.-H. 1993. Import demands for Norwegian farmed Atlantic salmon and wild Pacific salmon in North America, Japan, and the EEC. *Canadian Journal of Agricultural Economics* 41(1): 111-124.
- Honoré, A.M. 1961. Ownership. In: A. G. Guest (ed.) *Oxford Essays in Jurisprudence*. Oxford University Press. London, UK.
- Illinois Central R. R. Co. v. Illinois*. 1892. In: 146 U.S. 453-454.
- Knapp, G., Roheim, C.A. & Anderson, J.L. 2007. *The Great Salmon Run: Competition Between Wild and Farmed Salmon*. TRAFFIC North America. Washington D.C.: World Wildlife Fund.
- Macinko, S. 1993. Public or private?: United States commercial fisheries management and the public trust doctrine, reciprocal challenges. *Natural Resources Journal* 33: 919-955.
- Magnuson Fishery Conservation and Management Act of 1976 (MSFCMA)**. Public Law 94-265 as amended by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act, Public Law 109-479. In: 16 USC 1801 *et seq.*
- Marine Mammal Protection Act of 1972 (MMPA)**. In: 16 USC 1361 *et seq.*
- Matulich, S.C. 2007. Impact of processing quota on Alaska king crab harvesters: empirical evidence. Paper presented at the 2007 forum of the North American Association of Fisheries Economists, Merida, Mexico.
- Matulich, S.C. & Clark, M.. 2003. North Pacific halibut and sablefish IFQ policy design: quantifying the impacts on processors. *Marine Resource Economics* 18: 149-167.
- Matulich, S.C., Sever, M. & Inaba, F. 2001. Fisheries cooperatives as alternatives to ITQs: implications of the American Fisheries Act. *Marine Resource Economics* 16:1-16.
- Matulich, S.C., Mittelhammer, R.C. & Reberte, C. 1996. Toward a more complete model of individual transferable fishing quotas: implications of incorporating the processing sector. *Journal of Environmental Economics and Management* 31:112-128.
- Matulich, S.C. & Sever, M. 1999. Reconsidering the initial allocation of ITQs: the search for a Pareto safe allocation between fishers and processors. *Land Economics* 75:203-219.
- McCay, B.J. 1998. *Oyster Wars and the Public Trust*. University of Arizona Press.
- Natcher, W., Greenberg, J.A. & Herrmann, M. 1996. Economic evaluation of superexclusive designation for the summer Norton Sound red king crab fishery. In: *High Latitude Crabs: Biology, Management, and Economics*. Alaska Sea Grant, Fairbanks, AK. pp. 153-165.
- National Environmental Policy Act (NEPA)**. In: 42 USC 4331 *et seq.*

- National Research Council (NRC).** 1998. *The Community Development Quota Program in Alaska and Lessons for the Western Pacific*. Washington D.C.: National Academy Press.
- National Research Council (NRC).** 1999. *Sharing the Fish: Toward a National Policy on Individual Fishing Quotas*. Washington D.C.: National Academy Press.
- North Pacific Fishery Management Council (NPFMC).** 1991. *Amendment 18/23 to the Bering Sea and Aleutian Islands and Gulf of Alaska Fishery Management Plans*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 1995. *Amendment 38/40 to the Bering Sea and Aleutian Islands and Gulf of Alaska Fishery Management Plans*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 1998. *Amendment 51/51 to the Bering Sea and Aleutian Islands and Gulf of Alaska Fishery Management Plans*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 2001. *Draft Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for a Regulatory Amendment to Incorporate the Charter Sector into the Commercial Individual Fishing Quota Program for Pacific Halibut in Areas 2C and 3A*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 2002. *Impacts of the American Fisheries Act*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 2004. *Bering Sea Aleutian Islands Crab Fisheries Final Environmental Impact Statement*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 2005. *Charter Halibut IFQ Motion*. Anchorage, AK.
- North Pacific Fishery Management Council (NPFMC).** 2007. *18-Month review of Bering Sea Aleutian Islands Crab Management*. Anchorage, AK.
- Pautzke, C.G. & Oliver, C.W.** 1997. *Development of the Individual Fishing Quota Program for Sablefish and Halibut Longline Fisheries off Alaska*. North Pacific Fisheries Management Council, Anchorage, AK.
- Pearse, P.H. & Wilen, J.E.** 1979. Impact of Canada's Pacific salmon fleet control program. *Journal of the Fisheries Research Board of Canada* 36: 764-769.
- Pew Oceans Commission.** 2003. *America's Living Oceans: Charting a Course for Sea Change*.
- Rettig, R.B. & Ginter, J.C. (eds.)** 1978. *Limited Entry as a Fishery Management Tool: Proceedings of a National Conference to Consider Limited Entry as a Tool in Fishery Management*. University of Washington Press. Seattle, WA.
- Simmons, R.T.** 2007. *Property and the Public Trust Doctrine*. PERC Policy Series PS-39, Bozeman, MT <www.perc.org>.
- US Department of Commerce (DOC).** 2007. *2006 Report to Congress on Apportionment of Membership on the Regional Fishery Management Councils*. National Oceanic and Atmospheric Administration, National Marine Fisheries Service. Silver Spring, MD.
- Wilen, J.E.** 1979. Fisherman behavior and the design of efficient fisheries regulation programs. *Journal of the Fisheries Research Board of Canada* 36:855-858.
- Witherell, D. (ed.)** 2005. *Managing Our Nation's Fisheries II: Focus on the Future – Proceedings of a Conference on Fisheries Management in the US Held in Washington DC., March 24-26, 2005*. North Pacific Fishery Management Council, Anchorage, AK.

