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Comparative Studies on Fisheries Management Strategies in
Canada and the United States

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Comparative Studies on Fisheries Management Strategies in Canada and the United States

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Abstract

This article sets out the following targets: to describe and analyze fisheries management strategies in Canada and the USA, compare FM in these two economies according to certain important criteria, single out common and specific problems of FM in those two developed economies, draw out conclusions and define what strategies are more applicable to Russian fisheries development. The analysis and comparison of FM in Canada and the USA is made according to the following parameters: management structures, management strategies and regulations, fisheries resource allocation (ITQs and IFQs), fisheries resources status and ecological aspect (EBFM approach). In the introduction, the importance of a new direction in marine fisheries-marine bio resources management is highlighted. This direction has the goal of promoting solution of the most important task of the third millennium - development of sustainable and responsible fisheries. I also consider it important to give a definition of the notion of marine bioresources management in the international law and stress the importance of political component in fisheries governance.

¹ This paper was partly written during my 4 week visit to the UBC Fisheries Centre in September and October 2005.

Introduction: Fisheries management is a hot topic for the world community

The Global Ocean is a treasury of marine bioresources and a gigantic food supplier for marine living organisms and for human beings. Presently, the marine bioresources are drastically running out under a heavy pressure due to anthropogenic factors.

Sustainable and responsible use of the commonly exploited bioresources, their conservation and management are highly topical and problematic issues for the world community. The question – What are responsible fisheries? - was set before fisheries professionals and scientists at the IIFET biennial conference in Japan, July, 2004 and the question is still open.

The nations of the world confront complex challenges in managing fisheries resources in the 21 century. Fisheries Management (FM) is a very topical and problematic issue for many maritime states both developed and underdeveloped.

To give a strong cooperative impulse to the states in marine resources sustainable development under the conditions of resource and jurisdictional crises, the world community under the auspice of the UNO (FAO) and special organizations has elaborated and accepted a number of important documents. And the most important among them is the Code of Conduct for Responsible Fisheries (1995).

All these documents are targeted at the *development of a new direction in marine fisheries – marine bioresources management* which allows world community to approach the solution of the most important task of the third millennium, defined by the Agenda for the XXI Century – development of the sustainable fisheries which would satisfy population needs in fish and other seafood products, would conserve marine bioresources and marine ecosystems as sustainable

productive resources.

Vylegzhanin and Zilanov (2000) write that in the situation of active and expansive bioresources exploitation, introduction of the internationally developed norms and standards in bioresources management into national laws as well as development of the mechanisms of bringing them to life is of the first hand importance.

These tendencies and the facts of marine stocks depletion forced nations to unite against unregulated activity of the fleets and develop cooperation among nations for preventing stocks being overexploited, which will lessen competition for the most valuable resources and will allow us to move from fisheries management to marine bioresources management.

Only under such terms and on the bases of bioresources sustainable use will world fish production likely increase by the year 2010 up to the level of 150 million tonnes and thus meet the minimum demands of the world population. The main part of the supplies will be represented by traditional species. Many countries, especially China extensively develop aquaculture of fish and other hydrobionts. The production of aquaculture may reach 40-50 million tonnes in the future.

We have already mentioned that fisheries tend to acquire global character. This recently gave rise to the need of formulating *a conception of marine bioresources global management*. Marine bioresources management as integrated system should include:

- Comprehensive study of fisheries species;
- Stocks and possible harvest assessment taking into consideration the ecological impact of harvesting of this or that component of stocks;
- Establishing levels of total allowable catches (TAC) on the bases of scientific data and considering biological characteristics of this or that stock, taking into account the “precautionary principle”.

- Introduction of respective fisheries regulations and controlling mechanisms of complying with them;
- Introduction of a fair system of TAC quotas distribution among users and controlling mechanism of compiling with them;
- Effective control and enforcement measures over fishing operations held by vessels of different type of ownership directly in fishing area, in areas of transshipment and in ports, including first sale of catch or seafood products;
- Continuous scientific monitoring of stocks status and ecosystem as a whole;
- Corrections of the previously set TACs in case of necessity;
- Elaboration of conflict resolution mechanism concerning TAC quotas distribution or introduction of certain fishing regulations or control measures;
- Establishment of Federal bodies on aquatic bioresources management and appropriate legislation, based on the International Law principles and norms, taking into consideration peculiarities of national scientific system development and practice;
- Wide range of cooperation among all participants of resources management, conservation and optimum utilization both on regional and international levels;
- Transparency and openness of all processes, connected with fisheries management. (Vylegzhanin and Zilanov, 2000).

The scientific understanding of marine ecosystems still remains limited and there is a mounting evidence that the fisheries sector and other human activities are having a serious impact on the ecosystems.

Given these growing problems, experts have been developing new ideas and approaches to complement the conventional fisheries management approach, which considers each fish stock in isolation or several fish species but not the wider marine environment. One concept considered in recent years is how an EBFM (Ecosystem Based Fisheries Management) approach might

contribute to achieving long-term sustainability for fisheries sector. Although the details of such an approach are still being developed, most experts agree that it should take a more holistic and integrative view of fisheries management. An EBFM approach should also emphasize strong stakeholder participation and focus on human behavior as the central management dimension. In this context, a number of organizations, institutions and government agencies have been working on the pressing question of how to include ecosystem considerations in capture fisheries management practices and procedures. (Anon., 2001)

Before starting to outline fisheries management issues, I consider it important to give *the definition of the notion of marine bioresources management in the International Law*. The essence of marine bioresources management is in providing at the international and national law levels for such effect on fish stocks and other bioresources that would stimulate their high level of reproduction.

Fisheries management is complex. Russian scientists Vylegzhanin and Zilanov (2000) basing on the studies of international and national laws point out six constituents of marine bioresources management: 1) ecological component; 2) marine hydrobionts stocks assessment and their monitoring, which must be based on the most bona fide information; 3) setting of maximum sustainable yield (based on the data on the dynamics of correlation of the following components: amount of fishing effort, amount of catch under this effort and the level of stock reproduction under this amount of catch), 4) economic component; 5) regulatory component, which translates ecological, economic, biological and other corresponding factors in terms of law - fisheries laws and regulations; and 6) institutional component (enforcement).

There is no single strategy of fisheries development applicable for all states. Each country must determine its own development policy from the range of alternative objectives.

Fisheries Management in Canada

General characteristics of the Canadian fisheries

According to the Canadian statistics, fish consumption in Canada constituted, in 2001, 9.65 kg/year per capita. (<http://www40.statcan.ca>).

Canada's fishing industry operates on the Atlantic and Pacific coasts. The country exploits more than 100 commercially valuable species of fish. About 1.2 million tonnes of marine species were landed from 1989 to 1997. The top three marine species for the ground fish category in terms of landings were hake (105,786 t); redfish (36,600 t) and cod (31,142 t). In the pelagic and other finfish category in terms of landings herring (85% came from the Atlantic coast) made the bulk of the landings (215,972 t) followed by salmon (48,726 t) and capelin (21,800 t). For shellfish, the top three species landed in 1997 were shrimps (77,877); snow crab (71,369 t) and scallop (65,818 t) (FAO, 2001).

In terms of catch volume, the main Atlantic species in 1997 were herring, shrimp, queen crab and scallop. On Canada's Pacific coast, the most important species in terms of landed weight were hake, salmon, herring (mainly the roe fishery). On average, Canadian Pacific fisheries are about 35% of the Atlantic fisheries both in terms of landed weight and value.

On the Atlantic coast there were 43,831 full-time and part-time fishers in 1997. The Atlantic fishery consists of 22,643 offshore (greater than 19.8m) and inshore (less than 19.8m) vessels. Part of the offshore fleet consists of 106 large vessels (30.5 m and over), owned by a few vertically integrated companies, and concentrates on groundfish, primarily along the Scotian Shelf, Grand Banks and Hamilton Bank. These vessels are highly specialized, mobile, capital-intensive units, operating year-round.

In 1998, the Pacific fishery employed 9,286 fishers (reduced by 46% since 1985), of which 7,581 hold 1-year licenses and 1,705 hold 5-year licenses. The fisheries are, for the most part, conducted from small vessels in relatively protected waters close to shore. The commercial fleet has declined by 44% since 1985 and includes 4,367 vessels, mainly of less than 13.73 m length, primarily smaller gillnetters and trollers which catch pink, chum, sockeye, coho and Chinook salmon. The number of larger multi-purpose vessels has decreased by 17% since 1985.

Most fish catches in Canada are landed fresh at home ports. However, some halibut and rockfish on the Pacific coast is taken to US ports and, on both coasts, over-the-side sales to foreign vessels provide inshore fishers with buyers during glut periods when the plants are already at full capacity and cannot accept more fish. Data from 1996 indicates that about 59% of catches were sold fresh, chilled, or frozen, 13.7% were sold as prepared products, 13.4% as dried, salted or smoked, 12.2% as meals and soluble, and 1.6% as oil fats.

In 1995 Canada ranked as the seventh largest exporter of fish and fishery products in the world with a total export of 440,491 t , for a revenue of US \$ 2.3 billion . Fish exports by value mainly goes to the US (67%), followed by Japan (15%) and the European Union (10%). On the other hand, in 1998 Canada imported about 449 000 t. of fish and seafood products, costing US\$ 1.2 billion. The majority of these imports came from the United States (190,929 t; US\$ 473 million). Another major exporter is Norway. (Pitcher *et al.*, 2002).

Canadian fisheries management organizational structure

Though the organizational structure of fisheries management in Canada underwent numerous statutory and structural changes since 1867 from 1979 onward fisheries management was administered under the Department of Fisheries and Oceans (DFO), which *had a status of a*

ministry and was operating under a Federal Minister. It consisted of four primary components each headed by an Assistant Deputy Minister (ADM) and eleven Regional Director Generals, whose geographic, but not functional mandates overlapped.

Major changes took place in 1986 and 1990 aimed at streamlining the Department. Under the Minister and Deputy Minister (Parliamentary Secretary), the organization now includes a Senior ADM and four staff ADMs to cover Science, fisheries operations, regulation, policy and international issues. Regional operations are consolidated into six geographic regions, i.e., Newfoundland, Maritimes, Gulf, Laurentian, Central and Arctic and Pacific. Canadian Coast Guard Commissioner, who exercises the enforcement functions, reports to the Minister of Fisheries and Oceans. The Minister's authority extends to licensing (determining who has access to the fisheries), allocation (determining how much fish they are entitled to harvest) and establishing the rules for the overall conduct of the fishery (Pitcher *et al.*, 2002).

Fisheries management strategies in Canada

Sustainable Development Strategy for 2005–2006 for Fisheries and Oceans Canada (DFO) was formulated by Canada's Minister of Fisheries and Oceans in his Message. (<http://www.dfo-mpo.gc.ca>).

The principles of sustainable development lay at the basis of managing and protecting the country's fisheries resources and habitats. Transforming a commitment to sustainable development into reality, DFO elaborated a comprehensive Action Plan, which supports *the government-wide Oceans Action Plan*. *Highlights of the Strategy include:*

- advancing integrated oceans management;
- *establishing a federal Marine Protected Areas strategy;*
- implementing a strategy to address foreign overfishing;

- modernizing the governance of fisheries in Canada with *an emphasis on conservation frameworks*, leading to sustainable use of the resource through such activities as completing the Pacific Wild Salmon Policy;
- supporting greater Aboriginal involvement in managing fisheries;
- strengthening aquaculture governance regimes and regulatory processes through a federal/provincial/territorial framework agreement on aquaculture;
- modernizing marine navigation to support marine safety;
- creating an *Environmental Process Modernization Plan* to strengthen the administration of DFO's fish-habitat management program; and
- developing a *Strategic Environmental Assessment system* for policies and programs.

The Strategy also confirms DFO's co-operative approach to sustainable development. DFO intends to work with the partners with other levels of government, with Aboriginal groups, and with industry to ensure the broadest possible representation of Canadians in integrating sustainable development throughout Canada's fisheries and oceans sector.

The Strategy contains many initiatives underway to protect and conserve Canada's aquatic resources, while supporting the development and use of these resources for the benefit of all Canadians in the years to come.

Sustainable development is the lens through which Fisheries and Oceans Canada (DFO) undertakes its business. The Department works in partnership to derive economic and social benefits from Canada's oceans and freshwater resources while conserving the ecological integrity of those resources.

The principles of sustainable development maintain that social, economic and environmental issues are interconnected and must be equally integrated into the decision-making process. In the preparation of the SDS, DFO developed an approach that clearly links SDS commitments to the

Department's Strategic Plan and its outcomes. This Strategy identifies *three key sustainable development goals for the Department*, around which the Action Plan is built.

- *Sustainable Programs* – Outputs and targeted activities pertain to balancing the protection of aquatic resources with support for the development of economic and social benefits from these resources
- *Good Governance and Enhanced Partnerships* – In delivering its mandate, DFO works in partnership with various levels of government, industry, Aboriginal groups and non-governmental organizations
- *Sustainable Operations* – commitments denote means of "greening government" to reduce damage to the environment from departmental operations. This includes compliance with regulations (at all levels of government), DFO's Environmental Policy, other relevant federal policies, best practices, industry accepted standards and codes of practice.

Fisheries resources are unique among the natural resources in Canada. Unlike other natural resources, there is no private property right in Canadian tidal fisheries. Canadian tidal fisheries are common property and subject to a public right of fishing. The responsibility for the conservation and management of fisheries throughout the country rests with the federal government. (Fraser, 2000).

Canadian fishery objectives are stated as safe, healthy productive waters and aquatic ecosystems, for the benefit of the present and future generations, by maintaining the highest possible standards of service to Canadians in marine safety and environmental protection, in scientific excellence and sustainable resource use. The framework incorporates biological, economic and social dimensions and invokes the management of aquatic ecosystems as a crucial goal.

As it is stated in the fisheries management policy, conservation should have precedence over social and economic considerations, especially when there is a threat to the future of the resource. However when the survival of the resource is not at stake, economic/social factors will often take precedence over biological factors. And there is one more important aspect. Canadian constitution and jurisdiction give traditional Aboriginal use of fish first legal priority after conservation goals.

A major objective of Canadian fisheries policy is to insure “that allocation of fishery resources will be on the basis of equity, taking into account adjacency to the resource, the relative dependence of coastal communities, and the various fleet sectors upon the given resource, and economic efficiency and fleet mobility”. DFO uses a variety of management measures to address instability and mitigate the common property problem in commercial fisheries. The choice of which measure to use depends upon specific characteristics, specific fleet structure and location of a given fishery. *Methods employed* include regulating the type and size of gear used, vessel length, fishing times and areas, catch limits, limiting the number of licenses available to fish, and marketable harvest rights (*individual transferable quotas*). The important Pacific groundfish fisheries such as, hake, halibut and herring (roe fishery) have benefited from the introduction of various forms of *Transferable Quotas (ITQ)*.

There has been a trend recently to broaden the management for fisheries to include economic and social (not only biological) considerations to achieve an efficient use of human and capital resources. For example, in 1993, the Canadian Pacific halibut fishery formerly managed using input controls such as a strictly controlled and brief season of open days that led to danger for fishers, switched to a form of output control (ITQs). (Pitcher *et al.*, 2002).

Efforts are also being made to reduce the fleet through a series of vessel/license *buy-back (capacity reduction) programs*. Experts believe that “Buybacks are a rational part of responsible fisheries management”. Vessel buy-back schemes are operating on both coasts.

The buy-backs can, if properly funded, reduce capacity in fisheries. Further, buy-backs can be designed to address conservation, economic, and social objectives. But according to experts buy-backs should be used as a part of a transition from an ineffective management regime to one that is more effective. (Capacity Reduction through “Buyback” Programs, (Anon., 2004)).

Canadian fisheries receive a number of *direct and indirect subsidies*. Subsidies are defined as money paid to members of the fishing industry, over and above the proceeds of the landed catch, that has been collected in general taxation by the federal Canadian government and /or by the government of various Canadian Coastal provinces. There are many such schemes in Canada and it is difficult to estimate an exact amount, or for economists to agree on what constitutes an indirect subsidy to the fishing industry.

Subsidies to Canadian fisheries have been the subject of much debate even including the definition of the term subsidy. For example, the cost of research and fisheries assessment leading to the setting of quotas and enforcement regulations, are paid in Canada by the government out of general taxation and hence may not be considered a subsidy. Such costs have been estimated to be approximately 20 % of the catch value.

In Canada, all licensed fishers receive unemployment pay of up to 30,000 Canadian dollars per year when not fishing, irrespective of other earnings, provided they fish for 12 weeks of the year. On the Atlantic coast of Canada, over 3 billion dollars were paid between 1990 and 1998 to minimize disruption caused by the collapse of the cod fishery under a number of programs. The true subsidy figure is likely to be somewhere in between 100% and 200% (public money equals the value of the catch). (Pitcher *et al.*, 2002).

Canada's new direction in fisheries policy recognizes that the government has tried to do much alone in the fisheries area. By establishing the goals and policy framework for fisheries management, it will become increasingly possible to delegate fisheries management responsibilities to those mostly directly affected. In the future, government will be less focused on the day to day intervention in the fishery and the resource users rather than government will likely play a far greater role in the management of the Canadian fisheries. Their cooperation and support, appropriate incentive structures and accountabilities, are best positioned and most capable of finding the best way to achieve any given set of objectives. (Fraser, 2000).

Jurisdictional basis

The constitutional framework for fisheries management in Canada is defined in the Constitution Act, 1867. This Act gave the federal government exclusive authority over the management of fisheries in Canada. Discontent with this situation caused a number of cases to go to the courts on the division of powers over fisheries. *The Canada Oceans Act*, of January 1997 re-stated the role of the federal government vis-à-vis provincial and territorial governments in the matters of fisheries and oceans management. A set of documents was published to outline the role of both the federal and provincial/territorial governments. *Many provincial governments now have a fisheries ministry that works in partnership with the federal fisheries and oceans agency.*

A controversy arose over whether the Canadian government had manipulated scientific information about the collapse of the northern cod for political purposes, and consequently whether fisheries research should be moderated by, or even transferred to, an independent body. On Canada's Atlantic coast, a Fisheries Resource Conservation Council (FRCC) was established in 1992 as an independent organization at arm's length from the government with a mandate to provide stocks assessment and make public recommendations to the Minister of Fisheries and Oceans on total allowable catches and other conservation measures. The FRCC is structured as a partnership between government, scientists and industry. On Canada's Pacific coast the Pacific

Fisheries resource Conservation Council was set up as a similar independent watchdog body in 1998, but its mandate extends only to salmon fisheries.

On a federal level the federal mandate to manage fisheries, basically has been exercised primarily through two statutes, i.e., the *Fisheries Act*, the primary source of authority for managing domestic fisheries, and the *Coastal Fisheries Protection Act*, which is the primary authority for managing foreign fisheries under Canada's jurisdiction within its 200-mile fisheries zone. *These two acts provide the basic foundation for the Canadian fisheries management system.* The Acts provide wide-spread discretionary powers to the federal Minister and the federal Cabinet, to establish a flexible fisheries management system and to modify it almost at will: the Acts are generally silent on the direction of fisheries policy and leave wide latitude as to how these policies may be implemented.

A government wide regulatory reform in mid-1980s has required an advance notice of proposed regulations to allow time for public comment. *Since the establishment of the EEZs foreign fishing in the Canadian waters has been increasingly discouraged (down from 350 000 tonnes in 1975 to less than 2000 tonnes in 1999).* More over the rule has been for Canadian vessels to catch fish inside the EEZ and land the catches for sale or processing in Canada, although some trans-shipments at sea are licensed in the Pacific hake fishery.

On the Pacific coast, American fishing vessels are allowed to make passage from Washington to Alaska but are not allowed to fish en route. The British Columbian Government imposes a passage tariff on these vessels from time to time. On the Atlantic coast the main issue concerns Canada's claim to extend its managerial jurisdiction over fish stocks that straddle the EEZ on the tips of the Grand Banks, which lie in the international waters.

Canada is a member of several organizations that are responsible for the assessment and allocation of internationally important stocks and has signed the Ministerial Declaration on the

Implementation of the Code of Conduct for Responsible Fisheries in Rome in March 1999, supporting the implementation of the FAO Code. Canada however has not adopted the FAO code, which has broadly cast conservation objectives, but has set its own voluntary Code, which is restricted to fishing operations (Pitcher *et al.*, 2002).

Resource allocation: ITQs.

Individual Fishing Quotas (IFQs) and Individual Transferrable Quotas (ITQs) have been used worldwide since the late 1970s. A few countries, particularly Canada, NZ, and Iceland, have significant experience in the benefits and problems of developing, implementing, and managing IFQs. In a “right-based” management structure, privileges to harvest specific portions of the total allowable catch (TAC) are allocated to identified individuals or groups of individuals. IFQs, ITQs, allocations to fishing cooperatives, and community allocations are all forms of right – based management. (NOAA, 2005).

Fisheries experts consider that ITQ based system can be successful in conserving and managing stocks, as well as improving the economic performance and contribution from the fishing industry. The system has many benefits, including long term sustainability of the resource and allowing the industry to redirect its energy from activities designed to increase harvesting power to activities that increase harvesting efficiency and the value of the final product. Other advantages include the allowing of significant capital restructuring, the removal of uncertainty and instability, and making it possible for longer term planning in relation to harvesting, processing and marketing.

The transferability of the quotas enabled less efficient fishing firms to sell their quotas to the more efficient firms and leave the fishery. The negative result of ITQ system is that it leads to

concentration of fish quotas in the hands of the more efficient companies and the system wipes out the “little men” (Anon., 1993).

ITQs to which the fishing industry shifted in 1990 as some experts believe were successfully implemented in a number of Canadian ground fisheries (hake, halibut, herring).

Some experts in Canada speak about shortcomings and the social wrongs of PBR (property based rights) fisheries. According to Wrights (2004), management-regimes changes create winners and losers and fisheries management is a social trust that must encompass more than mere conservation. The case against property based rights is not based on its elegant theory, or intent, or forecast wondrous outcomes, but on the adjustment process, the Doctrine of Unintended Consequences and Peer’s law (second –order effects).

The regulators, bureaucrats, and environmentalists that increasingly dissipate fishery rents are more mobile and less vulnerable than the fishers being displaced. The social harm from this management (dying communities, failing firms, idle capital, and despairing displaced fishers) is immense and rising. Like many great social wrongs, this process was started with good intentions and bolstered by flawed science.

Wrights (2004) mentions Muse and Schelle (1989, p.109), who after reviewing IQ programs in various areas of the world note that, “holder will have the incentive to conserve his individual quota and devote it to its valuable use, but holder will have fewer incentives (than sole-owners) with respect to conserving stocks...The quota holder who engages in illegal dumping, high grading, under-reporting, smuggling, or misreporting may be negatively impacting the stocks for his own short-term gain. The cost of such actions in terms of reduced harvests in the future may be spread over all holders of the individual quota.”

Resources status and conservation

Fisheries management in Canada is strongly oriented on resources conservation. This is the main priority the DFO pursues. And it can be seen from the Minister of Fisheries and Oceans Message and strategic guidelines already mentioned in this article.

As the resources conservation issues have priority over economic and social considerations in the fisheries management in Canada, strong measures are taken for the survival of the resources.

Canadians have a long history of conserving their bioresources both Atlantic and Pacific. In 1923 the International Fisheries Commission, now the International Pacific Halibut Commission was established by Convention between Canada and the USA for preservation of the halibut fishery of the North Pacific Ocean and the Bering Sea. The commission answers to both governments and has a research and assessment arm, and link to the industry. Regulatory measures applied to this fishery over time have resulted in the conservation of the halibut stock, unlike its Atlantic cousin. A serious stock collapse of the fishmeal fishery in 1950s in British Columbia lead to a closure and strong emphasis was made on preserving herring resource.

By 1992, the biomass of spawning cod off Newfoundland and Labrador had fallen to only 22,000 tonnes compared with 1.6m tonnes 30 years earlier. America halved its fishing effort in the New England groundfish fisheries. Canada closed the Grand Banks, announcing a five-year aid package worth Cdn\$ 1.5 billion (\$1.05 billion). The collapse has cost 40,000 jobs in Newfoundland (Carr, 1998). The moratorium on commercial fishing for Northern Cod introduced in July 1992 lasted for 7 years. For several years after the cod moratorium a snow crab fishery was intensive in Newfoundland, but in 2000 quotas were cut back considerably after fears of heavy stock depletion.

The pacific salmon industry continues to suffer from declining stocks and poor financial performance on the part of fishers and processors. The industry's problems remain linked to

overcapacity. Efforts to conserve, protect and develop the fish resources and improve their utilization include strict limitations on places and times when fisheries are allowed. A salmonid enhancement program was designed to rebuilt stocks to allow approximately 150 000 t to be caught annually against the more recent average of 70 000 t.

Two rounds of *buy-back schemes (capacity reduction)* for vessels have been in operation for salmon fishery in Canada. Hake, halibut and herring fisheries are in reasonable condition and have benefited from the introduction of various forms of transferable quotas.

Statistics Canada indicates that many Provincial Governments put funds from resource-related recreation into managing the fish resource. Money from general taxation is also used. In Quebec a five-year restructuring program was initiated in 1990 that was aimed to consolidate the fishing and processing sector. The program is designed to re-establish a balance between the resources of the province and its processing capacity, stabilize the financial situation of fishers and renew the resources of the province. In British Columbia, the provincial government has set up a *Fisheries Renewal Program* that funds habitat reconstruction project for salmon streams.

In the view of growing demand for seafood in the world Canada is rapidly growing her small *aquaculture* industry and there is widespread recognition of the high quality of Canadian cultured seafood products (Pitcher *et al.*, 2002).

Fisheries Management in the U.S.

General characteristics of U.S. fisheries

According to William Hogarth, director of the NOAA Fisheries Service, seafood is a safe and healthy choice for all Americans and the demand keeps rising. The year 2004 is the third year in a row that U.S. per capita seafood consumption has increased. The consumption figure is up

from 16.3 pounds per person in 2003 to 16.6 pounds. In 2001 the rate was 14.8 pounds per person, and in 2002 it was 15.6 pounds per person. (<http://www.nmfs.noaa.gov/sfa/reports.htm>).

“NOAA’s *strategic plan for the year 2005*, envisioned a world in which social and economic decisions were made with comprehensive understanding of the environment. The plan provided a guide toward sustainable development. *Economic growth, maintenance of environmental quality, and wise use of the resources must go hand in hand to assure a rising standard of living.* The purposes of the sustainable fisheries are:

- increase the Nation’s wealth & quality of life
- support fishing industry jobs
- ensure recreational opportunities
- provide safe & wholesome seafood
- ensure sustainable resources for the future

Through:

- overfishing & overcapitalization prevention
- economic sustainability in communities
- environmentally sound aquaculture
- by catch reduction
- environmentally compatible fishery practices (Hogarth, 2002).

Commercial fisheries contributed \$31.5 billion of the \$11,040 billion GDP (0,295) in 2003 and recreational fisheries contributed about \$12 billion. Revenues from aquaculture production of 393,400 metric tonnes were about \$866 million in 2002. US consumers spent an estimated \$61.2 billion for fishery products in 2003.

The US fishing fleet is quite diverse in terms of sizes and gear types varying significantly among fisheries as well as among geographic areas. The number of vessels greater than 5 net tonnes

with commercial fishing documents is about 36,150 (2005). One consequence of the size and diversity of the harvest sector is that management of all US fisheries with the single policy is not feasible. Even individual fleets are quite diverse, and each fishery has unique biological, economic, and sociological characteristics that make broad-based policy impractical. On the other hand, regulation on a fishery-by-fishery basis is not practical or effective.

Commercial fisheries landings reached a peak of 4.8 million metric tonnes (10.5 billion pounds) in 1993 and 1994 and a value of \$3.8 billion. In recent years, the values of finfish and shellfish landings have been close to this figure. The industry supports employment for 250,000 harvesters and processors. U.S. recreational fisheries provide a source of recreation and food to approximately 17 million Americans.

Among major US domestic species landed in 2003 are pollock (1,532 million tonnes), menhaden (727 million tonnes), salmon (303 million tonnes), cod (269 million tonnes), flatfish (202 million tonnes), hakes (155 million tonnes), crabs (154 million tonnes), shrimp (143 million tonnes), herring (130 million tonnes), sardines (73 million tonnes). Alaska Pollock ranked first in landings in 2003, but 6-th in value (<http://www.fao.org/fi/fcp/en/USA/profile.htm>).

However the recent average commercial and recreational yield of all U.S. fisheries sources is still only slightly more than 60% of the best estimates of the long-term potential yield. The gross commercial value of the change in yield if all stocks were rebuilt to their long-term potential would yield an additional \$1.3 billion to the U.S. economy at the point of first sale. ([http://www.spo.noaa.gov/pdfs/LO Strat Plans2003-2008/final](http://www.spo.noaa.gov/pdfs/LO%20Strat%20Plans2003-2008/final)).

In a study of Federal Investment in the fishery sector, virtually all aspects of US tax, fisheries, and societal policies were examined to see whether they created subsidies for the fishing industry

and whether these subsidies had impacts. The study determined that the US influences capitalization to a lesser degree than some other fishing nations. For the last several decades, Federal assistance has markedly declined and remnant programs have become much more focused. The more significant programs are those that allow deferral of income taxes to be used on vessel improvement, buyback programs that retire excess capacity, and a loan guarantee program that permits a few vessels to have longer loan terms than otherwise available. These programs have very little impact on adding additional fishing capacity or making US fisheries commodities more competitive in the world market. *The gross value of direct US subsidies* was cited as \$25 million, or slightly more than 0.5% of the gross ex-vessel value of commercial landings. There are no major ship construction subsidies, market development and other forms of assistance that are readily apparent in developed and developing fishing industries around the world (<http://www.fao.org/fi/fcp/en/USA/profile.htm>).

Management structure and mission

USA National Marine Fisheries Service (NMFS) operates within the framework of the National Atmospheric and Oceanic Administration (NOAA). It is a federal agency, a division of the Department of Commerce. NMFS is responsible for the management, conservation and protection of living marine resources within the United States' Exclusive Economic Zone (200 mile offshore). Using the tools provided by the Magnuson-Stevens Act, NOAA's National Marine Fisheries Service assesses and predicts the status of fish stocks ensures compliance with fisheries regulations and works to reduce wasteful fishing practices. Under the Marine Mammal Protection Act and the Endangered Species Act, NMFS recovers protected marine species (i.e. whales, turtles) without unnecessarily impeding economic and recreational opportunities. With the help of the six regional offices and eight councils, NMFS is able to work with communities on fishery management issues. NMFS works to promote sustainable fisheries and to prevent loss

of the economic potential associated with overfishing, declining species and degraded habitats. NMFS strives to balance competing public needs.

The goal of NMFS policy is to optimize the benefits of living marine resources to the Nation through sound science and management. This requires a balancing of multiple public needs and interests in the sustainable benefits and use of living marine resources, without compromising the long-term biological integrity of coastal and marine ecosystems.

Improving fisheries governance in U.S.

The goals of the nation's first fisheries policy, the Magnuson Fishery Conservation and Management Act (FCMA) of 1976, were straightforward; to establish a national fishing zone out to 200-miles off U.S. coasts, *eliminate foreign fishing in this zone (phasing out policy)* and manage domestic fisheries for maximum benefit to the nation. (Criddle, 2000). By 1985, foreign directed fishing had been almost entirely replaced by joint venture and domestic harvesting. By 1990, the joint-venture fleet had been supplanted by a wholly domestic fleet. The FCMA established a system of co-management based on eight regional fishery management councils and 10 national standards for fisheries management.

Eight regional fishery councils work with local communities to develop management goals and strategies for each region's fisheries. Voting council members are nominated by the states' government and appointed the U.S. secretary of Commerce. The councils include local representation of commercial and recreational fishing interests, state and federal scientists, and non-voting members from the U.S. Fish and Wildlife Service, the U.S. Coast Guard and the U.S. State Department.

Current U.S. fisheries policy employs a unique approach to governance, reflecting a participatory democracy. Using stock assessments from NOAA, on-the-water expertise of fishermen, and data from many sources, the councils work with scientific and statistical committees to determine

fishery conservation needs. *During public scoping and public hearings*, the councils request feedback on proposed fishery management measure and their potential impacts.

Public participation helps the councils understand the needs of coastal communities and allows the public to offer alternative approaches to meeting conservation goals that might result in less economic impact to the industries. When developing management measures, the councils also consider advice from advisory panels, made up of academics, scientists, conservationists, anglers, commercial fishermen, and other citizens with fisheries expertise.

Once a management measure has worked its way through the public process, has been fully vetted by scientists, debated by the public, deliberated upon by council members, and given full council approval, it is submitted to NOAA. Officials at NOAA check to ensure management measures meet the requirement of the Magnuson-Stevens Act's 10 National Standards and comply with other federal mandates such as the National Environmental Policy Act, the Endangered Species Act, the Marine Mammal Protection Act, and the Regulatory Flexibility Act. Once these checks are completed, the Secretary of commerce either approves and implements them, or disapproves and sends them back to the councils for any necessary revisions. Council actions may also be partially approved, but NOAA may not make changes to them.

In 2004, the US Commission on Ocean Policy began a national dialogue about U.S. fisheries governance, recommending several changes that might strengthen the current process, or at least *give the public more confidence in a system* that has been seen by some as having conflicts of interests. The *US government Ocean Action Plan* includes both short-term and long-term goals and strategies for improving ocean governance.

The Congress prepares to *reauthorize the Magnuson-Stevens Act* and addressing certain *key issues*. Among them is *separation of conservation and allocation decisions*. Some groups have

advocated that fishery conservation needs should be determined by an *independent scientific committee without political or financial ties to the fisheries*. This recommendation would allow the independent science group to establish annual catch limits, while giving the regional councils authority to allocate the total allowed catch among user groups.

Others believe that *conservation and allocation go hand in hand* and both should remain within the purview of the regional councils to protect public participation in the process. Another issue is *to broaden the representation on the councils to include conservationists, academics, and other interested members of the public*. Some groups have advocated the *creation of new regional councils* to aid in the identification of conservation needs and to help develop fishery management plans.

Resource allocation: IFQs.

A key component to sustainable fisheries in the future is *capacity reduction*. Capacity in many U.S. fisheries vastly exceeds what is necessary to harvest and process the optimum yield. The root cause of overcapacity is the open-access history of most fisheries, exacerbated by subsidized financing, improving technology, and a race for fish. Capacity of the fisheries must be matched with sustainable harvest amounts. Right-based management, such as individual fishing quotas or cooperatives, is arguably the most promising way to achieve that match. (NOAA, 2005).

Such management tool as IFQs has been adopted in four U.S. fisheries (Alaskan halibut and sablefish, wreckfish, and surf clams/ocean quahogs), and programs were about to be implemented in two other fisheries when Congress intervened through enactment of the Sustainable Fisheries Act of 1996, establishing a moratorium on new programs. Congress asked the National Academy of Sciences to study a wide range of questions concerning the social, economic, and biologic effects of IFQs and other limited entry systems and to make recommendations about existing and future IFQ programs. A committee with expertise in

fisheries biology and management, anthropology, economics law political science, and business was established to study all aspects of IFQs in response to the request from Congress. Over a seven-month period, the committee held hearings in Anchorage, Seattle, New Orleans, Washington, D.C. and Boston. It heard testimony from fishermen, processors, state and federal regulators, academicians, environmental groups, and members of the public.

As a result the committee had a broad view of the real and perceived effects of the existed and proposed IFQ programs. Just as there is tremendous variation among U.S. fisheries, the mechanisms applied to them vary according to perceived necessities in each region and the dynamics of the regional fishery management councils. The committee was entreated to respect the individual needs of fisheries, fishing communities, and fishing region and refrain from endorsing rigid blueprints at the expense of hard worn measures, carefully crafted to address unique local biologic and social conditions. (Anon.,1999).

The IFQ is one means to limit entry in order to reduce overcapitalization and the wasteful practices that occur under other systems. A major intended effect of IFQs is to create economic incentives for owners of vessels to decrease their inputs of labor and capital to a fishery.

A number of advantages and concerns were identified from the range of IFQ programs implemented in U.S. fisheries.

From the point of view of resource conservation and stewardship the primary conservation benefits of IFQs arise from the establishment and enforcement of the TAC. Second order effects can reduce bycatch, discard, reduced bycatch mortality, reduced ghost fishing.

According to Criddle's research of IFQ implementation in halibut fishery:

- Prior to IFQs, halibut catches exceeded the TAC by an average of 6%. Since implementation, halibut catches have been an average of 8% below the TAC.
- IFQs have reduced halibut fishing mortality due to lost/abandoned gear by 428.2 mt (legal catch worth \$ 1.8 million)
- Discard of halibut bycatch in the sablefish fishery declined by 710 mt due to the ability of sablefish fishermen who also possessed halibut IFQ to retain their bycatches of halibut. (Criddle, 2000).

Advantages: IFQ programs are widely identified as being a highly effective way of dealing with overcapitalization in the fishing industry. Removing the race for fish has reduced the incentive to buy ever-larger vessels and more equipment and to fish during unsafe conditions. Consumers have been able to purchase fresh fish during longer periods of the year. Many fishermen testified that IFQs provided the opportunity to utilize better fishing and handling methods, reducing bycatch of nontargeted species and maintaining higher product quality.

Concerns: A number of problems were identified in operative IFQ programs. Prominent among them are concerns about the fairness of the initial allocations, effects of IFQs on processors, increased costs for new fishermen to gain entry, consolidation of quota shares (and thus economic power), effects of leasing, confusion about the nature of the privilege involved, elimination of vessels and reductions in crew, and the equity of gifting a public trust resource.

The use of IFQs should be considered on a fishery-by-fishery basis. IFQs can be used to remedy overcapitalization and overfishing or to prevent the development of these negative effects. Although IFQs is no panacea, it deserves a place in the array of techniques that may be needed in any particular fishery management plan. Its value in matching harvesting and processing

capacities to the resource, slowing the race for fish, providing consumers with a better product, and reducing wasteful and dangerous fishing has been demonstrated repeatedly (Anon.,1999).

After studying all the consequences of ITQ implementation the Congress in 1996 said “no” to IFQs and in 1998 said “yes” to cooperatives. (McCabe, 2000). But nevertheless after lifting the IFQ moratorium, the right-based programs were extended to new U.S. fisheries, including the Gulf of Mexico red snapper fishery, the Gulf of Alaska groundfish fisheries, and the Bering Sea and Aleutian Islands crab fisheries.

From an economic perspective, cooperatives offer the advantage of eliminating production externalities that may remain under an IFQs program with large owner classes. More significantly, development of IFQ programs appear to be increasingly overwhelmed by the proliferation of both equity concerns and seemingly interminable rent-seeking behavior - both issues can effectively block adoption of IFQs.. Potential efficiency gains are the inducement for cooperative solutions. Though IFQs appear to be better suited than cooperatives to fisheries with large number of diverse participants, the empirical evidence suggests that cooperatives have potential momentum and pose a serious challenge to the future of IFQs. (Criddle and Macinko, 2000).

Resources status and conservation

In 1996, Congress of the U.S. passed the Sustainable Fisheries Act, directing NOAA Fisheries to end overfishing and rebuild overfished stocks.

There is a great variety of stocks in the vast US EEZ (11.5 million sq. km) from the biological and geographical point of view. The major Pacific Coast species are Pacific salmon, coastal pelagic fishes, groundfish, pacific halibut, and near shore resources. Most stocks, including all five salmon species, are either fully or over utilized. Depressed salmon production is partly due

to generally unfavorable ocean conditions and habitat degradation. The Pacific sardine population has been increasing after decades of low abundance. Jack mackerel and northern anchovy are underutilized. Major resources of the Alaska region are Pacific salmon, groundfish, Pacific halibut, shellfish, and herring.

Many resources, particularly flatfish are underutilized. Western Pacific region (Hawaiian Islands) is famous for highly migratory stocks (tunas, billfishes, swordfish, sharks, and others). These stocks account for 99% of the region's catches and support some of the most valuable fisheries in the world. Among Western Pacific species are also bottom fishes (snappers, grouper, jacks, emperors) and invertebrate species.

The mixed-species groundfish fishery has traditionally been the most valuable in the Northeast, followed by American lobster and Atlantic sea scallop. Principle groundfish and flounders in the Northeast, particularly cod, haddock, and yellowtail flounder, have been severely overfished, reaching record low levels in spawning stock biomass in 1993-1994, but have been rebuilding. Most Northeast Region fisheries are governed by Fishery Management plans (FMPs) that are either in place or under development. Despite the goals of FMPs, overexploitation of their respective species has occurred in many cases, and efforts to rebuild have generally not yet succeeded in fully restoring depleted stocks. There are 18 federally managed stocks in the Northeast that are overfished: Gulf of Main cod, Georges Bank cod, Gulf of Maine haddock, Georges Bank haddock, American plaice, witch flounder and others. There are also 26 stocks whose condition is known to be not-overfished.

The highly migratory pelagic species are also important components of domestic fisheries in the Northeast and Southeast Regions. Marlins (blue and white) and sailfish and many tuna species are overfished.

According to NOAA's annual Status of U.S. Fisheries Report to Congress, overfishing continues to threaten many fish populations. The experts, however, consider that the eight fisheries management Councils are failing to do this conservation work effectively. According to the Director of Fish Conservation at the Ocean Conservancy, fishery managers today continue to ignore the law and allow unsustainable fishing for many of economically and ecologically important fish and it is time to put long-term sustainability ahead of short-term profits.

The Ocean Conservancy introduced the Overfishing Scorecard in March 2005, which compiles summary scores on *success at ending overfishing and rebuilding depleted stocks*, using data supplied annually from the National Marine Fisheries Service. The goal of the Overfishing Scorecard is to *highlight the successes and failures* of federal fishery managers. The scorecard is necessary because the Fisheries Service's annual report lacks simple measures of success and failure and does not hold managers accountable for their performance. (<http://www.fao.org/fi/fcp/en/USA/profile.htm>).

The Overfishing Scorecard shows that when managers prevent overcapitalization of fishing fleets and set and enforce responsible limits based on science, they can progress in ending overfishing and rebuilding stocks. However, when fishing is allowed to exceed scientific recommendations, fisheries managers are putting resources future at risk.

Scorecard showed improvement in ending overfishing in areas along the U.S. West coast and Alaska and regression in Hawaii: other regions showed little or no change. *The overall national performance has not changed from last year.*

Table 1: Overfishing Scorecard (ending overfishing and rebuilding depleted stocks in %):

1. Region	2003	2004
2. North Pacific	82%	88%
3. Pacific	75%	79%
4. Mid-Atlantic	75%	79%
5. West Pacific	77%	65%
6. New England	58%	57%
7. South Atlantic	57%	57%
8. Gulf of Mexico	58%	50%
9. Caribbean	50%	50%

Bill Hogarth, director of NOAA Fisheries Service has asked the Regional Fishery Management Councils to develop measures to reduce harvest rates for the stocks with a new overfishing status and begin rebuilding those declared overfished. Some Councils already have begun to take corrective actions.(<http://www.nmfs.noaa.gov/sfa/reports.htm>).

The NOAA Fisheries Mission for 2003-2008 is stated as *Stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems.*

Under this mission, the goal is to optimize the benefits of living marine resources to the Nation through sound science and management. This requires a balancing of multiple public needs and interests in the sustainable benefits and use of living marine resources, without compromising the long-term biological integrity of coastal and marine ecosystems.

The First NOAA Mission Goal is to protect, restore, and manage the use of coastal and oceanic resources through ecosystem-based management (EBM). The three objectives of this Strategic plan are:

- A. Protect and restore ocean, coastal, and Great Lakes resources;
- B. Recover protected species; and
- C. Rebuild and maintain sustainable fisheries.

To address these major challenges, the Councils and NOAA Fisheries should begin to design and implement EBM approaches to management of fisheries and oceans in their regions. The regional Councils appear to be appropriate ecosystem units, and some of the Councils are actively drafting ecosystem-based plans for their fisheries. (NOAA, 2003).

Comparative analysis

Policy making component as an integral part of fisheries management

I consider policy making component to be one of the most important constituents in fisheries management. In the USA and Canada carefully elaborated fisheries management strategies appear to be effective tools working for the benefit of the nations.

The main purpose of any government is to maintain the welfare of the nation, including alimentary security. Fish consumption in the developed countries is rising from year to year. Fish is a powerful source of protein and free fatty acids (Omega-3) supporting the health of a nation. In Canada fish consumption in 2001 constituted 9.65 kg per capita and in the U.S fish consumption has been steadily raising for the last 3 years, reaching in 2004 the figure of 7.5 kg per capita. The share of fish in the diet of Russians has been lowering for the last 15 years, and it is an objective socio-economic evidence reflecting the weakness of the industry's executive power.

Introduction of the 200-mile EEZs in the world initiated by the UNCLOS in 1982 has greatly influenced the fisheries management strategies of the maritime states.

In the *United States* fairness and efficiency of the governance are mandated by the Magnuson-Stevens Act since 1976. "If the government considers choosing any management tool, they must recognize and respect the interests of all those involved in the fishery—crew members, skippers, their families onshore, prospective fishermen, and all related entities" (Anon., 1999). After worldwide introduction of the 200-mile exclusive economic zones foreign fleet was ousted from the US EEZ, giving all privileges of resources harvesting to the national fishermen. The whole country discussed the law.

In management strategies both countries presuppose wide range of public involvement in the governing process of the industry. Public discussions on all fisheries management aspects and public participation in the management process are welcomed and always underlined in the US. *Canada's new direction in fisheries policy* is to delegate fisheries management responsibilities to those mostly directly affected and the resource users rather than government will likely play a far greater role in the management of the Canadian fisheries in the future.

Having a goal of conserving and protecting nation's bioresources the governments of Canada and US chose the policy of ousting the foreign fleets operation from their exclusive economic zones.

It is a rule in both countries to land the catches for sale and to process in their own country. In Russia the 200-mile zone is open to foreign fishing, what greatly contributes to the resources overfishing.

Russian fishing industry is in a disastrous state. The *Russian Government* speaks a lot about food security and develops a great number of plans, concepts, and programs in fisheries;

undertakes multiple restructuring of the fisheries ruling body and replaces incompetent government officials; tries different approaches to fisheries resources allocation, but situation only aggravates.

The role of the state in marine fisheries management should grow with the process of global marine bioresources depletion and it is connected with changes of economic strategies in fisheries. And this must result into institutional changes, first of all in the functions of the fisheries law base.

Managing structures

Both fisheries management bodies, DFO in Canada and NOAA's NMFS are stable structures with a history, which provide for the experienced governance of fisheries.

In Russia the organizational structure of the main fisheries governing body has been a painful problem since the beginning of a transition period. The Russian fisheries governing body has been reorganized 8 times since 1992 and still the new structures do not satisfy the industry needs.

According to an American fisheries expert Dr. Keith Criddle (Department of economics, Utah State University, Logan) the problems of fisheries management in many countries are the inevitable consequence of flawed institutions. The resource base is in decline not because the science is inadequate, but because the actual level of direct and incidental catches exceeds levels that are biologically sustainable. The actual level of catches exceeds sustainable levels because the institutional structure encourages fishermen to exceed their catch limits; a problem that arise because the fishermen have no long-term ownership of the resource base, and thus will not restrain themselves, and enforcement resources are stretched so thin that there is little danger of being caught and prosecuted for exceeding the catch limits.

Management schemes and jurisdictional basis

Management schemes of both countries are reflected in carefully elaborated strategies. All aspects discussed here are part of the overall management process. On the whole as it can be seen from the Strategic Plans the countries pay great attention to resources conservation issues and ecological aspects of fisheries management and for Canadian government resources conservation issues in case when resources are threatened have priority over socio-economic ones. Both countries incorporate EBFM into their fisheries management strategies.

Fishing is uncertain and competitive activity in which strategies are associated not only with biological and technological factors. For fisheries managers it is very important to consider the human factor while elaborating management strategies. This factor includes fishers perception, the ways fishers develop dynamic fishing tactics as an adaptive response to changes in resource abundance, environment conditions and market or regulatory constrains (Salas and Gaertner, 2004). Both countries developing their fisheries management schemes are guided by this factor.

Canada and the US rely on the strong jurisdictional basis. *The Canada Oceans Act*, of 1997 re-stated the role of the federal government vis-à-vis provincial and territorial governments in the matters of fisheries and oceans management. Many provincial governments now have a fisheries ministry that works in partnership with the federal fisheries and oceans agency.

The two acts: *Fisheries Act*, which is the primary source of authority for managing domestic fisheries, and the *Coastal Fisheries Protection Act*, which is the primary authority for managing foreign fisheries under Canada's jurisdiction within its 200-mile fisheries zone provide the basic foundation for the Canadian fisheries management system.

The *Magnuson-Stevens Fishery Conservation and Management Act (FCMA)* of 1976 creates the jurisdictional basis for the U.S. fisheries development and it is designed to manage domestic fisheries for maximum benefit to the nation. The *US government Ocean Action Plan* includes both short-term and long-term goals and strategies for improving ocean governance.

Any management measure in the U.S. fisheries management works its way through the public process, then it is studied by scientists and fisheries experts, council members, and given full council approval, it is submitted to NOAA. And if a management measure meets the requirement of the Magnuson-Stevens Act's 10 National Standards and complies with other federal mandates, the Secretary of commerce either approves or disapproves it. Presently to improve the jurisdictional basis, the U.S. Congress prepares to reauthorize the Magnuson-Stevens Act, addressing certain key issues.

It is very important for the goals of my research to underline that there are *no property rights* on the marine bioresources in Canada and USA. The USA legislation does not establish property right on the marine bioresources, neither private nor public or else and there is no private property right in Canadian tidal fisheries.

The American legislator did not consider it necessary to introduce property right in the marine bioresources regime that is into the traditional sphere of the public right. On the contrary the US legislation has introduced the *entire public right regime of the federal governance over marine bioresources*, one and the same for the territorial sea, the exclusive economic zone and for the continental shelf. *Canadian tidal fisheries are common property and subject to a public right of fishing.*

Unlike other nations Russia has established the property right on marine areas (The Aquatic Code of Russian Federation, November 16, 1995). It must be said that the UNO Convention on

the Law of the Sea of 1882 does not use civil rights notion “property” in the articles concerning marine areas and their natural resources even within the state territory. “Territorial supremacy does not mean the property right on the territory. Territorial governing is included into the sphere of the public rights, and property is included into the sphere of private rights and these two kinds of supremacy do not coincide with each other”.

It is important to say that the question of the Russian Federation property right on marine bioresources does not agree with the UNO 1982 Convention (Vylegzhanin and Zilanov, 2000).

In Russia the fishing industry stagnated in law vacuum since the beginning of the Reconstruction period, and for a long time there was no legal basis for the effective functioning of the industry. The main fisheries Act *About Fisheries and Conservation of Aquatic Bioresources* had been under discussion for 8 years. Finally in December, 2004 it was approved by the Federal Council and signed by the President of the Russian Federation. The Law provides jurisdictional grounds for the aquatic bioresources harvesting and also for the mechanism of quotas distribution. It is targeted at the effective use of bioresources in the situation of market development. In Russia public involvement into the process of elaboration of fisheries law is inactive, underdeveloped and lacks jurisdictional basis.

Resources allocation as a part of the management scheme

Property based right system (ITQs and IFQs) have been used worldwide since the late 1970. Though some experts in world fisheries speak in favor of the system and the potential benefits of the right-based management it is among the most controversial management issues in US and Canadian fisheries. The controversy stems from both intended and unintended consequences that may arise in a rights-based management program. In the US the consequences of IFQs were studied nationwide and moratorium on IFQ was introduced for some years.

Weighing pros and cons some experts believe the crucial point is that economic rationalization of ocean fisheries is probably inevitable. A property rights based system, such as the ITQ system appears to be the most effective way of accomplishing this. But they warn that ITQs are not suitable for all fisheries. To make the system work, quota restrictions have to be enforced and the introduction of a system would require socio-economic adjustments that would often be resisted and which might consequently be difficult to accomplish (Anon., 1993).

The establishment of the state property right on marine areas allowed Russian Ministry for Economic Development to introduce marine bioresources quotas trading auctions. The failed system was in action for some years (2001-2004) and contributed a lot to Russian fisheries destruction. The new quota distribution system is far from perfect and jurisdictionally weak because many important factors of the present situation and specifics of Russian fisheries are not taken into consideration.

Subsidies

Governments have always used subsidies to encourage people to work and invest in fishing, especially after territorial waters extended to 200-miles in the 1970 and foreign fleets were kicked out. A recent study by the World Bank estimates that these subsidies are worth a total of up to \$16 billion a year. They come in many forms, including direct aid for building boats and state-financed fisheries management.

The US, having scrapped programs to expand the national fleet, still exempts fishing from fuel duty and lets fishermen defer income tax. Fishermen exploit a resource that belongs to everyone, without paying rent- unlike, say companies that log government-owned land. If you count that as a subsidy too, the study says, the total aid to fishing worldwide amounts to as much as \$21

billion the total aid to fishing worldwide. (Carr, 1998). The gross value of direct US subsidies to fisheries constitutes \$25 million.

Both US and Canada apply the policy of fleet capacity reduction through IFQ/ITQ systems and buy-back programs. Buy-back programs in Canada are more actively employed.

Canadian fisheries receive a number of *direct and indirect subsidies*. It is an impressive fact that in Canada, all licensed fishers receive unemployment pay of up to 30,000 Cdn dollars per year when not fishing, irrespective of other earnings, provided they fish for 12 weeks of the year. On the Atlantic coast of Canada, over 3 billion dollars were paid between 1990 and 1998 to minimize disruption caused by the collapse of the cod fishery under a number of programs. The true subsidy figure is likely to be somewhere in between 100% and 200% (public money equals the value of the catch) (Pitcher *et al.*, 2002).

Direct subsidizing of Russian fisheries had stopped since 1992, the reconstruction period. Only some federal funding is available for aquaculture development.

Resource status and conservation

EBFM (Ecology based fisheries management) is very topical issue for world fisheries development. To reinforce responsible and sustainable fisheries in the marine ecosystems countries must be guided by the principles of the FAO Code of Conduct for Responsible Fisheries and other important world community documents targeted at resources conservation.

Fisheries resources status both of Canada and USA looks encouraging and close to sustainable, notwithstanding some stocks overfishing and depletion. The resources status in the US is under the strict control of the Ocean Conservancy employing a new tool in conservation process such as Overfishing Scorecard. NOAA fisheries Strategic Plan for 2003-2008 is carefully elaborated

with the mission goal to protect, restore and manage the use of coastal and oceanic resources through EBM.

The U.S. Congress prepares *to reauthorize the Magnuson-Stevens Act* with the intention of separation *of conservation and allocation decisions*. According to some experts fishery conservation needs should be determined by an *independent scientific committee without political or financial ties to the fisheries*, which would allow the independent science to establish annual catch limits, while giving the regional councils authority to allocate the total allowed catch among user groups.

Canadians have a long history of conserving their bioresources both Atlantic and Pacific. Fisheries Resource Conservation Council (FRCC) was established in 1992 on Canada's Atlantic coast as an independent from the government organization to provide more objective stocks assessment and make public recommendations to the Minister of Fisheries and Oceans on total allowable catches and other conservation measures. The FRCC is structured as a partnership between government, scientists and industry.

Fisheries management in Canada is strongly oriented on conservation of the aquatic resources and conservation issues have precedence over social and economic considerations when there is a threat to the future of the resource. Canada employs Sustainable Development Strategy for 2005–2006 for Fisheries with a strong emphasis on conservation frameworks and environmental process modernization and Ocean Action Plan.

Russian Fisheries resources are drastically running out under heavy pressure of the Russian and foreign fleets. IUU, which developed the commercial character for the long years of law vacuum and auctions, at which bioresources were traded, turned into a hot problem in Russian waters now. Russian EEZ unlike the zones of Canada and US is open to foreign fishing. There are also other

economically unjustified (unprofitable for Russia) and ecologically dangerous factors that contribute to destruction of marine bioresources, such as international Sakhalin shelf oil projects.

Conclusions

Fisheries Management is a hot topic for both developed and underdeveloped economies. Marine bioresources of maritime states sometimes appear to be commonly held resources and need to be managed and exploited in a sustainable manner in compliance with the FAO Code of Conduct for responsible fisheries.

In the situation of bioresources depletion, overexploitation and jurisdictional crises, the world community elaborates regulative documents constituting a kind of jurisdictional basis for resources conservation and moves from marine fisheries management to the marine bioresources management, trying to apply EBFM approach.

Fisheries management is complex and simple solutions to management problems are hardly available. Management involves biological, social, human factors and economic considerations, budget constrains and agencies cooperation, legal requirements and regulatory flexibility, politics and public perspectives. There is no one strategy applicable to all states and all fisheries.

Policy making component is an important component in fisheries management. Presently the role of the state in fisheries management should grow in connection with global marine bioresources depletion and it should concern changes of the economic strategies in fisheries. This leads to institutional changes, first of all in the functions of the fisheries law base.

Comparative analysis of fisheries management strategies of Canada and U.S. shows that both states have developed carefully elaborated management schemes represented in strategic plans

and sustainable development strategies of bioresources exploitation and conservation working in close partnership with scientists, fishers, environmentalists and public.

The problems of fisheries management arising in both countries are typical problems of fisheries management in the whole world. They are mainly connected with resources conservation and fair resources allocation and are solved in a similar way: capacity reduction programs and resources conservation and protection measures, introduction of EBFM approach. Public involvement in decision making is one of the key guidelines in fisheries management both in Canada and U.S.

Resource status in both states notwithstanding the depletion of some stocks looks encouraging. From my point of view, resource allocation problems, connected with IFQs and ITQs systems implementation are more profoundly solved in the U.S., because more attention is paid to social wrongs, and the problem of resources conservation and protection is better solved in Canada, which has a long history of resources conservation and strongly ecologically oriented science and public.

Russian fisheries development could gain a lot from the successful experience in fisheries management strategies implementation of both Canada and USA, especially it concerns resources allocation systems, capacity reduction, industry subsidizing, wide public involvement in law basis formulation, and resources replenishment, conservation and protection strategies.

Profound experience of both Canada and USA in the development of fisheries governance and FM strategies, which comprise a lot of aspects, is very valuable and important for Russian fisheries and is worth studying in details.

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