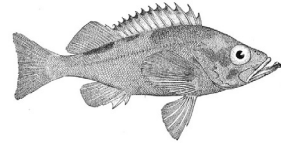


CATCH SHARES IN ACTION

**British Columbia Integrated
Groundfish Program**



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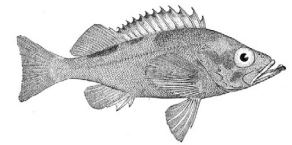


SEASALT

- Secure
- Exclusive
- All sources
- Scaled
- Accountable
- Limited
- Transferable

CATCH SHARES IN ACTION

British Columbia Integrated Groundfish Program



SPECIAL DESIGN FEATURES



MULTI-SPECIES, INDIVIDUALLY-ALLOCATED, QUOTA-BASED, TRANSFERABLE

The British Columbia Integrated Groundfish Program (Integrated Program) is one of the most comprehensive catch share programs in the world. The multi-species program includes over 70 species, 30 of which are managed via quota, and includes all commercial fishermen targeting groundfish, regardless of gear type. The program includes a number of innovative design features such as quota set-asides, which are meant to encourage community development and incentivize positive treatment of crew. Additionally, the program requires 100% individual accountability of all catch and uses an innovative monitoring and catch accounting system to support accountability.

The British Columbia groundfish fishery has a 20-year history with catch shares: The first catch share program was implemented in 1990 for the sablefish (*Anoplopoma fimbria*) fishery, followed one year later by the halibut (*Hippoglossus stenolepis*) fishery. In 1997, the groundfish trawl fishery implemented an IVQ Program, and in 2006, managers implemented the Integrated Groundfish Pilot Program that combined the halibut, sablefish and groundfish trawl programs and incorporated all commercial hook and line caught rockfish, lingcod (*Ophiodon elongates*) and dogfish (*Squalus acanthias*) into one overarching program. The overarching program was made permanent at the start of the 2010/2011 season and is what we refer to in this report as the Integrated Program.

The fishery occurs off Canada's west coast and is managed by Fisheries and Oceans Canada (DFO), with joint management of halibut stocks by the International Pacific Halibut Commission. Fishermen use hook and line, traps and trawls to harvest over 60 stocks of groundfish. The total value of groundfish landings was \$124 million in 2007 (Fisheries and Oceans Canada, 2009a).

SYNOPSIS

Road to a Catch Share

Until the late 1970s, there was little management of marine resources in the waters off British Columbia. The groundfish fishery was open to domestic and foreign fleets, and by the mid-70s, stocks had started to decline (e.g., in 1974 halibut landings were just one third of the averages in the 1960s). In response, managers began implementing a variety of conventional management measures including limited entry licensing, annual catch limits, fishery closures, and gear and vessel restrictions.

Fishing licenses were largely based on the vessels' target species. For example, fishermen targeting halibut were required to have a halibut license while fishermen targeting sablefish were required to have a sablefish license. Fishermen who did not hold the appropriate license were not permitted to land those species. In actuality, fishermen were encountering multiple species and were therefore required to discard large amounts of marketable species.

From 1980 to the early 1990s, the capacity and ability of the fleet to catch fish increased dramatically. In 1980, the commercial halibut fleet harvested 5.7 million pounds of halibut in 65 days; in 1990, fishermen harvested 8.5 million pounds in six days (Sporer, 2001). In every year from 1979 to 1990 (except 1980), the halibut catch limit was exceeded and a race for fish resulted in shorter seasons, unsafe fishing conditions, large quantities of discards, poor quality of fish and inconsistent supply of fresh fish (and corresponding low dockside prices).

The experience was similar in the sablefish and groundfish trawl fisheries. In fact, the groundfish trawl fishery was closed in 1995 due to severe overharvesting of the catch limit and the inability of managers to ensure compliance with catch limits (Sporer, 2001). The system failed to ensure sustainability leading to depletion of fish stocks, and the economic viability of the fleets and communities that depended upon them was decreasing.

The 1990s marked a time of widespread change. In response to the failures of conventional management, and often upon request of the fishermen, catch share programs were implemented in the sablefish, halibut and groundfish fisheries in 1990, 1991 and 1997, respectively. The halibut and sablefish programs were initially implemented as trial programs, but they were formalized shortly thereafter, upon meeting identified conservation and economic goals (Sporer, 2001). In 2006, the remaining groundfish fleet (mostly hook and line vessels) were introduced into the program and all commercial fisherman targeting groundfish (including halibut and sablefish) were integrated into a single catch share program.

Conservation and protection of fish and fish habitat is the first goal of Canada's fishery management. Following this mandate, additional goals include compliance with regulations, secure and stable access for fishermen, fairness to individuals and groups, promotion of historical participation, economic viability, best use of the fish for economics, social and cultural needs, and assuring public access.

Performance

The catch share program is successfully meeting its goals. Fleet-wide catch limits are rarely exceeded, bycatch rates have been substantially reduced, revenues and profits have increased, season length has increased and jobs are more stable (Munro et al., 2009; GSGislason and Associates, Ltd., 2008). The catch share program has a robust system of individual accountability which has ensured catch limits are not exceeded and stocks are doing well. No species in the groundfish complex are designated under the Species at Risk Act, meaning no species require special management attention (Fisheries and Oceans Canada, 2009a).

Bycatch had previously been a substantial problem in the groundfish fishery, especially because fishermen were often required to discard perfectly marketable species that were caught as bycatch, i.e., directed sablefish fishermen discarded halibut due to regulations. One primary impetus for integrating all groundfish species under one management plan was to reduce discards, and the system has been largely successful in accomplishing this goal.

As of 2007, there were over 300 active licenses in the British Columbia Groundfish fisheries. Close to 200 of these were used to operate in the halibut fishery with the remainder spread out fairly evenly over the other fisheries (Turris, 2009). Most vessels are multi-licensed and can participate in several fisheries (i.e., a vessel will have all the necessary licenses to fish halibut, sablefish, rockfish, lingcod and dogfish by hook and line gear).

STEP 1 IN ACTION

Define Program Goals

General objectives of management for the groundfish fishery are to ensure sustainability, economic development and equity. More specific objectives have been outlined for the management of some groundfish species in each management plan.

Overarching goals for the Integrated Program included conservation of fish stocks, increased benefits from the groundfish fishery, and a fair distribution of benefits arising from the Integrated Program. Specifically, the management objectives outlined prior to development of the Integrated Program are:

- Maintain the existing processing capacity
- Stabilize employment in the fishery
- Encourage economic development in coastal communities
- Ensure the fair treatment of crew
- Allow for controlled rationalization of the fleet
- Minimize the negative consequences associated with the leasing and concentration of quota shares (Sporer, 2001)

DFO developed five additional objectives prior to the integration of all stocks into IVQs in 2006 (Fraser, 2008):

1. Account for all rockfish catch
2. Manage rockfish catch according to established rockfish management areas
3. Require fish harvesters to be individually accountable for their catch
4. Implement new monitoring to ensure above objectives
5. Examine species and stocks of concern and take action for precautionary management

STEP 2 IN ACTION

Define and Quantify the Available Resource

One important design feature of the Integrated Program is the coordinated management of all species and fishermen. There are over 70 marine species under management in the groundfish fishery, 30 of which are managed through the allocation of quota shares.

Many of the species in this fishery have multiple biological stocks, which were reflected in previous management plans as eight designated Groundfish Management Areas (Fisheries and Oceans Canada, 2009b). These were maintained in the Integrated Program and there are 60 species and area combinations with distinct catch limits and quota allocations for each. Catch limits are set annually by each species-area combination and are based on scientific advice provided to managers at the Department of Fisheries and Oceans. Where available, stock assessments are used to set catch limits consistent with government policy on precautionary management. Compliance with catch limits is extremely high.

Fishermen do catch some species that are not included in the Integrated Program, mostly traditionally un-marketable species, and there is some concern regarding the discards of unmanaged species and other species of concern (Driscoll et al., 2009). For example, prior to 2004, fishermen in the groundfish trawl fishery were allowed to land and sell bocaccio (*Sebastes paucispinis*) (a species with no catch limit), resulting in high catches. In 2004, DFO and industry agreed that all bocaccio landings would be relinquished and the proceeds from sales would be used to conduct research on the species. This policy resulted in little economic incentive to target, catch and retain the species: Total catch, which includes landings and discards, has declined by more than 50% but there has been an increase in discards (Driscoll et al., 2009). The program is expected to continue to evolve and further improve management. This highlights the importance of having a catch limit and allocating quota for encountered species.

STEP 3 IN ACTION

Define Eligible Participants

Eligibility to participate in the catch share program has been primarily driven by historical participation in the fishery. Shares in the Integrated Program can be held by individual participants owning licensed vessels in one or more of the seven directed groundfish fisheries. Only licensed commercial groundfish vessels and/or fishermen are permitted to hold and fish shares.

The Integrated Program includes a number of concentration limits to prevent over-consolidation in the fishery. Concentration caps vary based on the needs of the participants for each fishery. Some are set lower to protect sectors that may be more vulnerable to extensive leasing or sale outside of the sector, while others are set higher to ensure that participants can operate at levels that are profitable. There are caps on trades between individuals and separate caps on trades between sectors (e.g., halibut trading to groundfish). Furthermore, there are identified limits for the long-term share, IVQ, and the annual allocation units for a number of species, areas and sectors.

The majority of individual concentration caps are based on percentage of holdings, although some caps limit weight. Individual species concentration caps in the groundfish trawl fishery are based exclusively on a percent of the catch limit and range from 4% – 15% depending on the species. Caps on directed dogfish are set on a weight basis, while directed dogfish shareholders are also subject to caps on all other species, determined as a percent of dogfish IVQ holdings (the caps range from 0.04% – 5.80%). Weight-based caps are also used in the directed rockfish fishery, for non-halibut species in the halibut fishery, and for non-sablefish species in the sablefish fishery. In the sablefish fishery, there is no concentration cap on temporary or permanent transfers, so a single participant could technically own or lease 100% of the quota, although this has never happened and the average quota holdings are around 3.22% (Fisheries and Oceans Canada, 2010b).

Individuals who were not initially allocated shares generally lease or purchase shares to enter the groundfish fishery. Special programs also exist to provide access for members of First Nations communities. Under one program, existing shareholders can offer licenses and quota to DFO for a self-identified price and DFO can choose to purchase or not. If DFO purchases the license from commercial operators, they issue equivalent community-held communal licenses to First Nations. From 2007 to 2009, the government spent 50.3 million Canadian dollars (U.S. \$47.55 million) to acquire 6.43% of the commercial halibut catch limit, 4.77% of the sablefish catch limit, 0.24% of the groundfish trawl catch limit and 44 commercial licenses for groundfish (31 of which were halibut licenses) (Fisheries and Oceans Canada, 2009c). In addition, the recreational fishery has leased some quota from commercial halibut shareholders on an annual basis to address increasing harvests in the recreational fishery.

STEP 4 IN ACTION

Define the Privilege

In order to meet the myriad program goals, managers carefully defined the privilege. At its most basic, the program uses a quota-based privilege that allocates secure shares of the total catch for a number of species. However, there are a number of unique rules on trading that vary by gear type and target species. Some of the complexity relates to how the different fisheries were integrated over time.

The sablefish, halibut and groundfish trawl privileges are granted annually with a very strong presumption of renewal. The newly integrated sectors including rockfish, lingcod and dogfish began management under a three-year Integrated Groundfish Pilot Program in 2006, a program that was made permanent starting in 2010.

The Integrated Program allocated long-term shares, IVQ holdings, which are a percentage share of the total catch limit for each species-area designation. At the beginning of each season, shareholders' annual allocation units, or IVQ pounds, are calculated by multiplying the yearly catch limits by participants' IVQ holdings.

Participants are allowed to permanently and temporarily transfer shares, but there are numerous limitations. Under full integration, regulations regarding transfers between sectors were developed and established and complexity of the rules regarding transferability of quota has increased.

The trading rules are mainly focused on maintaining sector-specific allocations and limiting concentration of quota into one sector. Within the halibut, sablefish and groundfish trawl sectors, permanent transfers are allowed (i.e., halibut within halibut sector, sablefish within sablefish sector, and groundfish within groundfish trawl sector).

Shareholders are allowed to carry over and borrow limited amounts of quota pounds from adjacent fishing years for select species. The permitted amounts are specific to each species. For example, for some species a shareholder may carry over 30% of his/her quota pounds; whereas other species are limited to 10%. Participants are allowed to "borrow" a limited amount of quota from the following year if they exceed their IVQ pounds and are unable to purchase additional quota pounds.

Transfers between the recreational and commercial sectors have also occurred in the halibut fishery. Prior to the 2004 and 2005 seasons, the recreational industry was not catching all of the recreational halibut catch limit, and the commercial industry wanted to access that fish. The government allowed the commercial industry to create a non-profit organization that could lease recreational catch limits. Through this arrangement, the commercial sector leased close to 320 metric tons, generating 1.8 million Canadian dollars (U.S. \$1.7 million) for a fund set up on behalf of recreational fishermen. More recently, the recreational sector has been interested in leasing shares from the commercial sector. In 2009, a letter was issued by the Sport Fishing Advisory Board soliciting commercial fishermen who might be willing to lease quota to the recreational sector. The recreational sector has 1.8 million Canadian (U.S. \$1.7 million) dollars from the previous deals to use toward leasing commercial quota.

All four programs limited quota transfers during a transition period. Initially, no halibut shares could be transferred to another halibut vessel, essentially prohibiting any consolidation of quota. By 1999, quota was freely transferable (temporarily and permanently) as long as no single halibut vessel held more than 1% of the catch limit (certain vessels with higher historical harvests were grandfathered in and exempted from the limit) (GSGislason and Associates, Ltd., 2008). Both permanent and temporary transfers are allowed within each sector, subject to concentration caps (GSGislason and Associates, Ltd., 2008). The Integration Program only allows temporary transfers between sectors and prohibits permanent reallocations of IVQ holdings. Over time, less stringent restrictions on quota transfers within and between sectors may be considered.

STEP 5 IN ACTION

Assign the Privilege

There have been four cases in which quota shares have been allocated in the British Columbia groundfish fisheries: sablefish (1990), halibut (1991), groundfish trawl (1997), and during the integration process for rockfish, lingcod, and dogfish (2006). Initial allocation of shares varied for each sector, but many common approaches were used. Both fishermen and managers played a role in the allocation process and all allocations have occurred after program development. All initial allocation privileges have been granted, rather than auctioned, to eligible participants.

Sablefish was the first fishery to implement IVQs. DFO originally proposed IVQs in 1984, but fishermen rejected the idea. In anticipation of the 1990 fishing season, which was projected to last just eight days, an industry group asked DFO for a quota program. Throughout 1989 DFO consulted with an industry advisory body, the Sablefish Advisory Committee (SAC), and after several meetings DFO distributed a survey with an outline of the trial catch share program and proposed allocations for each license-holder. Ninety-five percent of respondents supported the proposal and an IVQ Program was introduced in 1990, nine months after the initial request by industry (Sporer, 2001).

The halibut fishery followed a similar approach, except DFO established the Halibut Advisory Board (HAB) comprised of license holders, processors, First Nations and union representatives to determine initial allocation of quota shares. Many proposals were put forward, including equal shares, pounds based on vessel length, auctions and shares based on the number of crew employed. After a four-day deliberation, the HAB nearly unanimously agreed on an initial allocation formula (Sporer, 2001). The allocation formula was voted on by halibut license holders as part of an overall IVQ proposal. Seventy percent of respondents voted in favor of the IVQ proposal.

In late 1995, industry representatives and DFO began discussing changes to the management of the groundfish trawl fishery and developed a paper outlining six management options. Participants agreed on pursuing the IVQ approach. Following these discussions, DFO hired a retired Supreme Court justice as an independent arbitrator to recommend the initial allocation formula. Following a public process including hundreds of comments, the judge

submitted recommendations that were ultimately approved. After 14 months of negotiations, the IVQ Program was introduced in 1997.

The primary eligibility requirement for initial share allocations was a groundfish-specific license. All initial grantees were required to have a license and eligibility was limited to licenses that directly targeted species within each fishery (e.g., sablefish license holders were eligible for sablefish IVQ, halibut license holders were eligible for halibut IVQ, and groundfish trawl license holders were eligible for groundfish IVQ species).

Under the integration program, certain license holders were eligible for lingcod and dogfish IVQ allocations if they had landed a total of 1,000 and 3,000 pounds, respectively, from 1996 to 2003. To receive rockfish allocation, eligible participants were required to hold Inside or Outside Rockfish licenses. In addition, halibut license holders were eligible for allocation of rockfish quota.

The initial allocation formulas were largely based on catch history or catch history and vessel length. Some shares were also allocated based on equal sharing (e.g., to certain license categories). In the sablefish, halibut and groundfish trawl fisheries, initial share allocation was based 70% on catch history and 30% on vessel length. These data were easily available through fish slips, dockside landings report data and license information.

The sablefish allocations were calculated on the license holder's best annual catch from 1988 or 1989. Both halibut and groundfish trawl allocations were based on catch history from 1986 to 1989. To accommodate all of the species in the groundfish trawl fishery, the allocation formula applied to hake (*Merluccius productus*) landings and separately to an aggregate of non-hake landings. Individual holdings were then calculated into groundfish equivalents. The resulting percentage for hake landings is applied to the annual catch limit for hake, while the non-hake IVQ percentage is applied to all species-area combinations to determine specific quota pounds for each species-area.

Lingcod and dogfish were allocated to eligible license holders based on catch history from 1996 to 2003. Rockfish species were allocated to eligible license holders in different manners, dependent on the license. Fishermen targeting species under an Inside or Outside Rockfish license were allocated equal shares of the numerous species annually. Halibut license holders were allocated rockfish IVQ as a percentage of their halibut holdings. This is calculated for each rockfish species-area combination (Fisheries and Oceans Canada, 2009b).

In addition, both groundfish trawl and dogfish implemented hold-back programs: 80% of the total groundfish trawl shares were allocated to eligible participants and the remaining 20% is held by the government and the IVQ pounds from these quota shares are allocated annually based on recommendations by the Groundfish Development Authority (GDA), which consists of representatives from communities, crew and shoreworkers, processors, groundfish trawl license holders, First Nations, and a non-licensed individual. The GDA oversees Groundfish Development Quota (GDQ) and Code of Conduct Quota (CCQ), each equaling 10% of total shares. These shares are allocated annually based on certain criteria, including treatment of crew and co-applications by processors and harvesters (Sporer, 2001).

GDQ allocation is intended to aid in regional development of coastal communities, attain employment objectives, and encourage sustainable fishing practices. CCQ was developed to ensure fair treatment of crew and safe vessel operation. CCQ is allocated to each vessel according to its particular quota holdings unless a complaint has been made and confirmed regarding treatment of crew. In such cases, the offending vessel would not receive any or a portion of its CCQ (Groundfish Development Authority, 2007). While the CCQ program has provided some benefits, critics worry that crew have little incentive to report poor treatment because it reduces the amount of quota for the vessel, therefore impacting the crew members' earnings, and some crew fear being blacklisted. As of 2005, there had been no formal complaints filed affecting CCQ for the groundfish trawl fleet (Grafton et al., 2005).

Similar to the Groundfish Development Quota, 10% of dogfish shares are held back for Dogfish Development Quota. Processors and licensed vessels are allowed to submit annual applications for this quota, and the Dogfish Development Committee makes recommendations for how to allocate the shares.

DFO established an official appeals process for all IVQ fisheries in regard to allocation. For halibut and groundfish trawl, specific review boards were established. The halibut board recommended changes to 30 participants' allocations based on their findings. The allocation for the entire fleet was then recalculated. A similar process for appealing data errors was conducted for the groundfish trawl fishery and the integration of the other sectors.

STEP 6 IN ACTION

Develop Administrative Systems

Individual accountability of all catch, landed or discarded, is a primary goal of the catch share program. The administrative systems are designed to account for all fishing mortality, ensure compliance and collect scientific data. All groundfish fisheries are subject to a robust monitoring program that includes logbooks, a hail system, 100% dockside monitoring and 100% at-sea monitoring. Catch accounting occurs at the end of each fishing trip.

Electronic monitoring, onboard observer, and dockside monitoring services are provided by private companies that are contracted by individual vessel operators, specific fleets or the government (McElderry, 2008a). Vessels are required to hail in/out at the beginning and end of every trip, primarily to coordinate the at-sea and dockside monitoring personnel.

The 100% at-sea monitoring requirement is fulfilled differently for various sectors. The majority of the groundfish trawl fleet uses onboard observers to observe all fishing events including landings and discards. The hook and line, trap, mid-water trawl for hake, and the small inshore groundfish trawl fishery use an audit-based electronic monitoring system that includes two or more cameras, a GPS system, a winch sensor, and a hydraulic pressure sensor that monitors the use of fishing gear. Fishermen are required to keep accurate logs of all trips and 100% of the fishing events are recorded, but only 10% of the fishing events for each trip are audited at random. Auditors

compare the logbooks to the video for accuracy. The data analysis is used to reconcile all catch information against the vessels' IVQ pounds. Within seven days, a quota status report is then sent to each vessel's contact.

Dockside monitors observe all offloads to verify the weight of all landed fish on a species-specific basis. This is then deducted from the vessel's annual IVQ pounds. Every landed halibut must be tagged by an observer at the offloading location to reduce illegally caught halibut from entering the market and to facilitate marketing British Columbia halibut as a distinct, high quality product. If a quota owner exceeds the allocated annual quota pounds for a species, they are prohibited from fishing until they either purchase additional quota pounds or borrow from the next year's allocation.

The "overage level" varies by target species and licenses being used. Directed and non-directed IVQ species have different "overage levels," and the level is either a set percentage of an individual IVQ holding or an absolute weight limit. For example, a shareholder in the lingcod fishery has incurred an overage if he/she exceeds his/her total directed lingcod IVQ pounds by more than 10% or 100 pounds. An overage can also occur if a shareholder exceeds his/her annual IVQ species cap. Any vessels that have landings in excess of the IVQ pounds for any species are given a Quota Status Verification Number (QSVN) that is then used during the hail-out for their next trip. Vessels are allowed one trip to clear excess overages on non-directed species.

Following integration of the groundfish sectors, there has been an increase in the complexity around trading quota. Potential buyers, sellers, lessors and leasees have to be cognizant of the prices, supply and demand within their sector, and of the rules on trading of species between sectors. The complexity of the restrictions has also increased, with inter-sector caps on quota, and some prohibitions on permanent transfers. To help facilitate this market, some privately-operated quota brokers have developed. They help facilitate voluntary trades by identifying willing buyers and sellers and matching them up. Some brokers also provide services for trip planning, quota status updates and fishing logs (Integrated Quota Management, Inc., 2009).

Industry and government share the costs of management. Private companies serve as designated service providers for at-sea, electronic, and dockside monitoring, while the government takes on the majority of the roles for catch accounting and management. IVQ holders arrange and pay for all direct costs of monitoring including at-sea and dockside monitoring services.

The aggregate monitoring costs for groundfish fisheries are around 5% of the fishery value every year (McElderry, 2008b), but costs vary by fishery and fleet. Costs are around 3% of the total landed value for the hook and line fleet and slightly higher for the groundfish trawl sectors. The costs are lower for the hook and line fleet mostly due to the use of electronic monitoring (EM) instead of onboard observers; daily cost of EM is approximately 154 Canadian dollars (U.S. \$146) versus 558 Canadian dollars (U.S. \$527) for onboard observers (McElderry, 2008b). Fishermen also pay minimal annual license fees.

In the sablefish fishery, the Joint Project Agreement between DFO and Wild Canadian Sablefish (an industry group) dictates the financial responsibilities of industry and management. The 2009/2010 plan specifies that industry will pay 1.5 million Canadian dollars (U.S. \$1.42 million) for fishery monitoring, science and stock

assessment, and some management costs. Costs for administration, salaries of government employees, and patrol vessels and aircraft are covered by DFO.

STEP 7 IN ACTION

Assess Performance and Innovate

There have been two major innovations in the catch share program used in the British Columbia groundfish fisheries. First, integrating all sectors into one overarching catch share program ensured total accountability for the entire BC commercial groundfish fisheries. Second, managers and fishermen were able to develop a flexible, innovative system that accounts for different species and different fishing business models. Along with this innovation, partners were also able to develop a comprehensive monitoring program that would work for a variety of different vessels. This included new technology and applications to provide a variety of solutions to meet the needs of vessels. Managers and fishermen continue to innovate in order to enhance biological, economic and social outcomes.