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PROCEEDINGS
of
The Coastal Pelagic Species
Catch Share Workshop

February 2-4, 2010
San Francisco, California

Prepared by
The National Marine Fisheries Service
Southwest Region



The Golden Gate Bridge



PREFACE

This proceedings document describes a catch share workshop that took place in San Francisco, February 2-4, 2010. The workshop was conducted to explore rights-based management approaches, or catch shares, as a potential means for improving the management and operations of the U.S. West Coast coastal pelagic species (CPS) finfish fisheries which target Pacific sardine (*Sardinops sagax caerulea*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), and northern anchovy (*Engraulis mordax*). The workshop focused primarily on the commercial fishing operations, and the conservation and management of the Pacific sardine fishery which has experienced significant reductions in allowable harvest and the length of the fishing seasons in recent years. These occurrences have raised concerns about the CPS fleet's ability to optimize CPS harvest throughout the year.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) (as amended in 2006) contains language supporting limited access privilege programs (LAPPs), a form of rights-based management popularly known as catch shares. By allocating portions of the allowable catch to eligible individuals, fishing entities or communities, LAPPs have the potential to enhance stability and promote long-term gains in conservation, social, and economic benefits from fisheries. Consequently, there is interest on the part of the National Oceanic and Atmospheric Administration's (NOAA), National Marine Fisheries Service (NMFS) to investigate

the potential for further application of LAPPs in U.S. fisheries. Based on conditions in the sardine fishery and NOAA's interest in the potential benefits from catch share management, NMFS began planning this workshop during the summer of 2009. The workshop brought together expertise from foreign fisheries where rights-based management tools have been implemented, as well as from U.S. West Coast fishery managers, the CPS commercial fishing industry and other CPS resource interests to consider the utility of catch shares in the conservation and management of the U.S. West Coast CPS fisheries.

In the case of Pacific sardine, an annual acceptable biological catch (ABC) is allocated to the U.S. fisheries on a seasonal basis according to a formula established in 2005 under Amendment 11 to the Pacific Fishery Management Council's (PFMC) CPS fishery management plan (FMP) (PFMC 2005). Using the best available science and careful management, the fishery has been very successful in achieving its ABC conservation target under Amendment 11. The CPS FMP also includes a vessel limited entry program for finfish CPS which was established to prevent excess capacity and to attain the ABC in an efficient manner. The federal limited entry program applies to vessels fishing south of 39 north latitude (*i.e.* Point Arena, California). Oregon and Washington also have state-enacted limited entry programs for vessels landing sardine into their respective ports.

Despite these limited entry programs, the potential for economic inefficiency exists because limited entry alone does not necessarily remove the incentives for fishermen to increase capacity. Fishermen, for example, can add vessel electronics and other fishing effort enhancements to expand their fishing power, or productivity, and in this sense the fishing capacity of their vessels. In the same vein, fishermen may also increase their harvest rates (*i.e.*, increase the amount of fish caught per unit time) to more fully utilize their existing capacity. With the recent reductions in the ABC this appears to be the situation that currently characterizes U.S. fishing operations for Pacific sardine. Harvest incentives under the Amendment 11 are such that fishermen are compelled to "race for fish" and the Pacific sardine fishery has begun to operate as a "derby" type fishery¹ (*sensu* Hilborn, 2003; Hackett et al., 2005). Given these circumstances LAPPs may provide one prospective means of improving the management and operations of the U.S. West Coast CPS finfish fisheries.

The proceedings document is organized into five sections. Section I reflects on the purpose and scope of the workshop as well as a series of background and case study presentations intended to improve participant understanding of rights-based management approaches and establish a common reference for discussing different catch share management programs. Section II covers the second part of the workshop which focused on information-sharing among workshop participants. Section III reflects on key issues discussed throughout the workshop and Section IV provides a wrap up of the workshop. Section V concludes the proceedings with final remarks and next steps.

¹ A race for fish occurs when boats compete to catch the fish before a quota is achieved or the fish are caught by someone else. The fishery becomes what is popularly referred to as a derby fishery when the race intensifies due to a low quota and large number of vessels.

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GLOSSARY OF ACRONYMS

ABC- Allowable Biological Catch

ACE- Annual Catch Entitlement, referred to as a quota lease in New Zealand

ACL- Annual Catch Limit

AFA- American Fisheries Act 1998

CDQ- Community Development Quota

CPS- Coastal Pelagic Species

CPUE- Catch per Unit Effort

ESD- Ecologically Sustainable Development, management objective in Australia

FMP- Fishery Management Plan

HG- Harvest Guideline

IFQ- Individual Fishing Quota

ITQ- Individual Transferable Quota

LAPP- Limited Access Privilege Program

MSA- Magnuson Stevens Act (Reauthorized 2007)

NMFS- National Marine Fisheries Service

NOAA- National Oceanic and Atmospheric Administration

PFMC – Pacific Fisheries Management Council

RFAs- Regional Fishing Associations

SAFS South Australian Sardine Fishery

SFA- Sustainable Fisheries Act (1996)

SWFSC- Southwest Fisheries Science Center

SWR- Southwest Region

TAC- Total Allowable Catch

Jack mackerel



I. BUILDING A COMMON UNDERSTANDING

The workshop opened with Mark Helvey, Assistant Regional Administrator for the Sustainable Fisheries Division of NOAA, NMFS, Southwest Region, providing an overview of the agenda (see Appendix A: Agenda). He explained that the planning goal for the workshop was to provide a platform for educational and information sharing purposes and that no decisions would be made pertaining to the use of catch shares for CPS fisheries. A range of presentations covering concepts, designs, and implementation strategies were prepared to provide a common understanding for workshop participants on rights-based, fisheries management and enable people interested in CPS fisheries to gain a better understanding about the use of catch shares in other global fisheries. Additionally, facilitated discussions were planned to explore the relevance and utility of catch share management and deliberate on the advantages and disadvantages of different allocation strategies across the range of participants' interests in CPS fisheries.

The workshop initially focused on two series of presentations that were intended to establish a common knowledge among the participants on the state of CPS fisheries and the use of catch shares in fisheries management (see Appendix B: Workshop participants). The first group of presentations gave background information on the current conditions of CPS fisheries as well as the general theory and terminology of catch share programs (see Appendix C: Speaker biographies). The second group of presentations consisted of case studies from catch share programs around the world that were focused either on fisheries targeting small pelagics or social considerations in different catch share program designs. Following the presentations, a panel of the case study presenters was convened in front of the audience to answer additional questions and discuss concerns.

Float Line



A. BACKGROUND

Following introductory remarks by Mark Helvey about the significance of catch shares from a policy perspective, Dr. Mark Holliday, Director of NMFS' Office of Policy, introduced Monica Medina, Principal Deputy Undersecretary for Oceans and Atmosphere of NOAA and chairperson of NOAA's Catch Shares Task Force, who joined the workshop via conference line to provide a national perspective on catch shares. Drs. Sam Herrick and Jenny Sun, economists from NMFS Southwest Fisheries Science Center, presented analytical perspectives on the current status of CPS fisheries including the context and strength of relationships between its fishing operations and the market. Dr. Rognvaldur Hannesson, Norwegian School of Economics and Business Administration gave the audience an overview of the theory of catch shares and cause-and-effect relationships to consider in program design and implementation. Amber Morris, of NMFS Southwest Region, reviewed rights-based management terminology and provided an overview on different types of programs.

1. Significance of Catch Shares from a Policy Perspective

Mark Helvey, Assistant Regional Administrator of Sustainable Fisheries Division, National Marine Fisheries Service, Southwest Region

Mr. Helvey characterized the increasing use of rights-based management tools, such as catch shares, as an outcome of managing fisheries with different regulatory tools and making adjustments to continually improve management over time. Since passage of the MSA in 1976, there has been a progression of tenure in U.S. fisheries. Management began with open access fisheries where the activities of participants were controlled with input or effort controls. Following that, managers began instituting output or catch controls and limited entry programs where the number of participants or vessel capacity was controlled. However, these management measures did little to encourage fishermen to delay or forgo harvest and actually increased incentives for fishermen to enhance their catching capacity.

The reauthorization of the MSA in 2006, provided for the implementation of LAPPs which opened the door to consideration of a new suite of rights-based management approaches including partnerships, corporations, cooperatives, and fishermen's associations. Broader emphasis was placed on allocating privileges to a wider range of potential recipients. Provisions for regional fishing associations and fishing communities were added as two new types of entities that can acquire and/or hold limited access privileges. In their various forms, LAPPs are intended to restructure incentives in the fishery for cost effective harvesting of the catch target.

“ Limited Access Privilege Programs (LAPPs) opened the door for the consideration of a suite of rights-based management approaches...”

–Mark Helvey

Mr. Helvey explained that, NOAA established the Catch Shares Task Force to encourage the nation's Fishery Management Councils to consider LAPPs and to identify impediments to full consideration or implementation of rights-based fishery management, or catch shares. The task force was charged with developing a national catch share policy and resolving any funding, policy, legal and infrastructure issues likely to hinder progress of the examination or implementation of catch shares. In the draft policy, NOAA expressed its belief that catch shares could play a valuable role in fishery management, and stated its support for the consideration and adoption of catch shares wherever appropriate for the purpose of achieving long-term ecological and economic sustainability of the Nation's marine resources and fishing communities.



2. NOAA Catch Shares Task Force

Monica Medina, Principal Deputy Undersecretary for Oceans and Atmosphere and Chairperson of NOAA's Catch Shares Task Force, NOAA

Monica Medina covered an array of topics that included a discussion on the need for catch shares, how they have benefitted fisheries, and then potential design features.² Next, Ms. Medina spoke on the status of NOAA's Catch Share Policy task force and mentioned that NOAA was still welcoming comments on a draft of the policy.

Talking Points

- *The Rationale for Catch Shares (based on results of existing programs)*
 - Catch shares are used to manage economic and biological components of fisheries
 - Flexibility in program design has been demonstrated
 - Well-designed programs have been effective
 - Literature indicates catch shares outperform other fisheries management tools

"[It is important to consider] the sustainability of communities and vibrant working waterfronts, including the cultural value of resource access traditions ... [w]hen well-designed, catch share programs can be really effective."

—Monica Medina

² Ms. Medina's presentation was viewed via remote link to NMFS headquarters.

- *Catch Share Program Development in the U.S.*
 - Budget for catch shares is significant
 - 13 U.S. fisheries in catch share programs, another four in the process
 - Based on input from Councils and interested stakeholders
- *Outcomes of Catch Shares (U.S. and foreign catch share programs)*
 - Addressed overfishing
 - Reduced the "race for fish"
 - Decreased overcapacity
 - Increased economic performance
 - Increased product quality
 - Increased safety
 - Increased stewardship
 - Increased co-management
- *NOAA's Draft Policy: Encourages and Supports Catch Share Programs*
 - Equips Councils with tools and assistance to explore catch share programs
 - Generates economic and environmental goals
 - Enables flexibility in the design
 - Supports identification of specific goals for individual fisheries
- *Design Considerations*
 - Transferability (e.g., leases, transfers)
 - Market power (e.g., prevention of excessive shares)
 - Fishing community sustainability
 - Future fishermen participation
 - Vibrant working waterfronts
 - Cultural value of resource access

○ Design Considerations (continued)

- Resource rent³
 - Decision of portion of rent to be collected by the government
 - Requirement of MSA that rent collected be spent on fisheries from which it came
- Periodic review of catch share programs to evaluate their performance
- Technical advice and collaboration beyond NMFS, including NOAA leadership support for consideration and use of catch shares

Question and Answer

Q: What does the NOAA catch share budget go to?

A: The money is for the whole country.

Q: Will MSA expand loan authority beyond entry level fishermen?

A: The approach of the Obama administration is to be creative and to provide assistance with international trade, development of markets, etc.

Q: Are there additional research funds for catch shares and fisheries, in general?

A: Dr. Lubchenco is trying to increase money for stock assessment and operational structure. We have asked for increases and hope to get them.

Q: If you are not able to get a handle on stock status, how can you figure out allocation?

A: You never have perfect data, but you cannot design something without any information. The process is certainly easier, the better the science.

³ “This surplus over and above all the costs of operation is the ‘rent’. The costs of operation in this context include all normal cash expenditure plus depreciation, the opportunity cost of labor and capital (that is, the potential returns from the next most profitable use of those inputs), a margin for the risks being faced and a return on any investment in exploring and developing the fishery” (Campbell and Haynes 1990).

Q: “Can’t manage what you can’t count.” How can we consider catch share programs when we do not know how many licenses are in the sardine fishery (i.e., federal verses state)? How small will the individual shares be when there are so many licenses?

A: Here’s where flexibility of a catch share program comes in. If you figure out what you want to achieve with management, you can use design criteria to achieve those goals, do analysis, get numbers, and review scope to identify changes to make. Ask NMFS for help.

Q: We have yet to identify a problem for CPS fisheries, but it appears NOAA is suggesting a solution already? What are we trying to accomplish here...if there is not a problem of overfishing? ...bycatch? ...or economics?

A: Generally, overfishing is a problem that can be addressed as well as the problems that led to it.

Counterpoint: It does not appear that we have identified overfishing as a problem and there are not any bycatch issues?

Response: Catch shares may not be right for every fishery. That is a fishery specific decision to make.

Comment from NMFS: Information sharing is a workshop goal; no one has said that a catch share program is going to happen for CPS fisheries.

Q: How do we address international and transboundary issues?

A: That will depend on the specifics of the program and what needs to be communicated to other nations. Generally, it is not much different from current management. In the end, there is some type of total allowable catch (TAC).

Q: How much support will NOAA offer with international allies?

A: Need to hear the context of the transboundary issues to say, but generally NOAA wants to help. It is our job to pay attention internationally and do what we can.



3. Conditions in the U.S. West Coast Coastal Pelagic Species Fishery

Samuel F. Herrick Jr., Industry Economist, National Marine Fisheries Service, Southwest Fisheries Science Center

Sam Herrick began his presentation by pointing out that the harvest control rule for Pacific sardine determines the annual harvest guideline (HG) which is then allocated on a seasonal basis to the fishery coastwide. The process and formula for the seasonal allocation was established in 2005 under Amendment 11 to the CPS FMP. Between 2005 and 2008 this process appeared to work to the satisfaction of all fishery sectors; southern California, northern California and the Pacific Northwest. In 2006 and 2007, the HG was more than adequate to meet the needs of industry and the full HG was not attained. However, this situation changed in 2008. The stock assessment that year resulted in a substantial decline in the sardine biomass estimate which translated into a 40 percent reduction in the HG from 2007. Major consequences of this reduction were concentrated fishing and premature closures of the directed sardine fishery seasons because the allocations were quickly utilized; a “derby” fishery resulted.

Dr. Herrick discussed how the derby fishery situation served as an impetus for this workshop to increase understanding of the science, economics and policies related to catch shares. He explained that presentations on the theoretical underpinnings of rights-based management in fisheries, and on the successes, failures, and challenges of rights-based management as experienced by others were planned to assist with this understanding. Dr. Herrick encouraged participants to use this information to generate meaningful discussions about the potential use of catch shares in U.S. West Coast CPS fisheries.

Talking Points

○ Why Hold This Workshop

- To think about what is happening in the CPS fisheries and consider LAPPs as possible management options
- To increase understanding of LAPP options and learn from case studies

“We conservatively manage the sardine fishery and do a very good job using the harvest guideline regime.”

—Sam Herrick

○ Background

- Pacific sardine and Pacific mackerel are actively managed species under the PFMC’s CPS fishery management plan
- Northern anchovy, jack mackerel, and market squid are monitored species
- Pacific mackerel fishery occurs almost exclusively off of California
- Pacific sardine are located off the West Coast of the United States, Canada and Mexico

○ Background (continued)

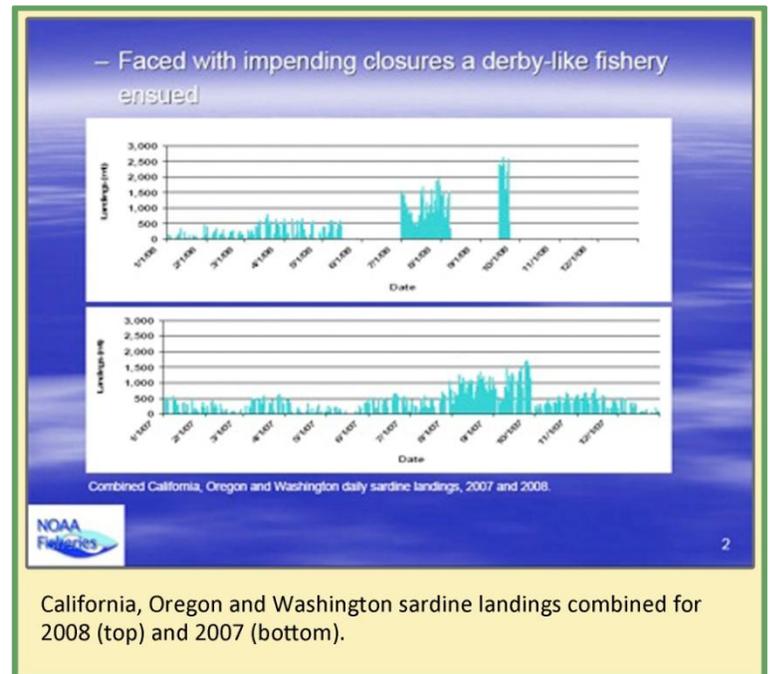
- Pacific sardine are targeted by three U.S. fishery sectors
 - Southern California (customarily San Pedro port area)
 - Northern California (customarily Monterey port area)
 - Pacific Northwest (Washington and Oregon; mostly Oregon landings)
- Peak fishing occurs at different times of the year for different sectors of the fishery
- CPS federal limited entry permits are required south of 39° North latitude (Point Arena)
- Oregon and Washington fisheries are managed under respective state programs

○ CPS harvest Policy

- Stock assessments to estimate biomass are conducted annually for sardine
- A harvest control rule is applied to the biomass estimate to come up with the HG
- Reference year is 2006, the year Amendment 11 was implemented

○ Amendment 11 Established Coastwide Seasonal Allocation

- 35 percent allocated January 1
- 40 percent allocated July 1 (depending upon season one usage, subtract over-usage or add unused)
- 25 percent allocated September 15 (depending upon season two usage, subtract over-usage or add unused)
- HG not attained in 2006-07
- 42 percent reduction of the HG in 2008
- HG reduction created a “derby-like” fishery with a race to fish
- Biomass decreased over the 2006-2010 period
- Demand increased over the 2006-2010 period



California, Oregon and Washington sardine landings combined for 2008 (top) and 2007 (bottom).

○ Current Situation

- Patterns of fishing intensity appeared to continue in 2009
- Economic incentives under seasonal allocations continued to stimulate a race for fish in the sardine fishery
- Race for fish incentives have potential to counter incentives for efficient exploitation of the resource

○ Contextual Issues

- Climate change affects abundance and distribution of sardines
- Fishery has a strong sense of community
- Interest of non-commercial parties (recreational, live bait, non-governmental organizations (NGOs), etc.)
- Transboundary management (Canada and Mexico)



Question and Answer

Q: Is there any evidence of more capital investment since 2008 and the appearance of derby fishing elements?

A: Currently, there is no direct data on this. This is because the limited entry programs in place do not allow increases in number of vessels. However, it is possible that the rate at which effort is being utilized by vessels in the limited entry programs has increased.

Audience Comment: In 2008, availability was coastwide which is what the data showed. A significant increase in capital has not been seen, but there will be an increase in processing capacity in 2011 when capital is displaced from the groundfish fisheries with the trawl rationalization program.

Audience Comment: In 2008, sardine was not disappearing just changing location and availability (e.g., when they were found, they were in high abundance) – is this being considered in stock assessments?

Speaker Response: NMFS has acknowledged discrepancies between the output of recent stock assessments and industry's observations of the stock. Industry has contributed funding for research and more surveys are planned.

Pacific Sardine School



Crow's Nest



Q: There are set asides of sardines for the purpose of protecting the forage species and cautioning against recruitment failure. How will annual catch limits (ACLs) factor in?

A: There is a cut-off parameter in the harvest control rule. The effect of the cut-off is a direct deduction in harvest quantity (150,000 mt) for these set-asides before the HG is fully calculated. The purpose of ACLs is to prevent overfishing. The harvest control rule is pretty forward-looking in that regard.

4. Price Response Analysis of the U.S. Pacific Sardine Fishery

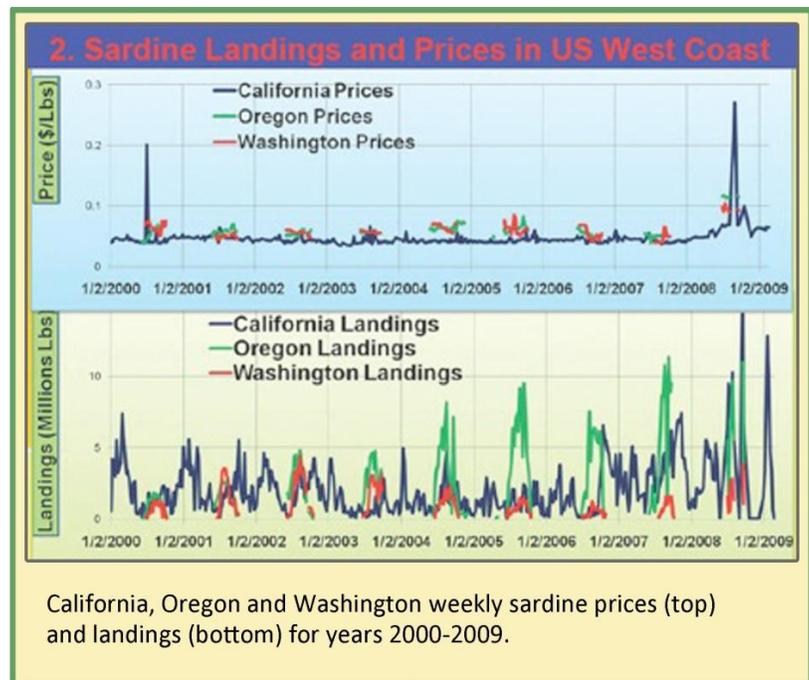
Chin-Hwa (Jenny) Sun, Professor, National Taiwan Ocean University

Jenny Sun focused on preliminary results from a collaborative analysis of ex-vessel price flexibility in the Pacific sardine fishery. A price-response analytical framework was used to explore the change in ex-vessel price given a change in the quantity of landings. An inverse relationship between the average price and the aggregate quantity supplied is the expected response under perfectly competitive market conditions.

Preliminary results from the analysis suggest price inflexibility in the Pacific sardine fishery, meaning that the ex-vessel price of sardines has been relatively unresponsive to changes in the quantities landed. Consequently, there has been no incentive for fishermen to reduce their landings since a decrease in revenues from a decrease in landings was only partially offset by an increase in price. With the current market structure, if harvest costs do not decrease with the decrease in landings, profits are expected to decrease as well. Given recent trends in the Pacific sardine fishery, the race for fish is likely to intensify with a corresponding increase in harvest costs. The researchers speculated on how the situation might be improved under rights-based management of the fishery.

Talking Points

- Effort Response to Price Changes in the U.S. Pacific Sardine Fishery
 - Pacific Fisheries Information Network (PacFIN) regional database was the source of landings and ex-vessel revenue data for this analysis
- Price response was studied in the ex-vessel Pacific sardine market
 - Average weekly sardine price for landings in excess of 8,000 pounds per landings receipt
 - Prices differ by disposition of catch (export, bait, restaurants)
- HG reduced by 40 percent in 2008
- Does a Reduction in the Harvest Guideline Stimulate a Race for Fish?
 - Analysis shows extremely small seasonal effects when looking at overall historical data
 - Analysis shows a significant seasonal effect when looking at 2008



○ *Does a Reduction in the Harvest Guideline Stimulate a Race for Fish? (continued)*

- Results suggest fishermen base their current period effort decision on last period's price
- Harvest guideline reduction increased revenue
 - Indicates price effect of supply reduction
 - Suggests processors felt compelled to raise the ex-vessel price to maintain fishing effort levels
- Price spike occurred near the end of the second allocation period in 2008
 - Suggests that as race for fish intensified, harvest costs were likely increasing with the reduction in the harvest guideline
 - Reflects processor price incentives to maintain fishing operations with the seasonal allocations nearing full utilization

○ *Results Show Inflexible Demand Curve*

- Costs are assumed to be directly related to effort (i.e., used number of fish tickets as proxy for effort)
- A 1 percent decrease in quantity corresponds to 0.04 percent increase in price
- Supply decreases will not likely increase price enough to offset supply change
- Harvest costs that do not adjust to the decrease in landings will likely decrease profits
- Fishing costs are likely to increase with a decrease in the HG

○ *Conclusions*

- With price inflexibility, a reduction in fishing costs is needed to maintain profitability
- If Pacific sardine is traded in the global market, there is likely to be little effect of the U.S. West Coast supply on price

“[P]reliminary results suggest ... that the ex-vessel price of sardines is relatively unresponsive to changes in the quantities landed ...[and that] a decrease in revenues from a decrease in landings will only be partially offset by an increase in price.”

–Jenny Sun

Question and Answer

Q: Is there significant catch outside the U.S. EEZ?

A: U.S. sardine TAC was 80-90 percent of Canada/Mexico TAC. Starting in 2008, Mexico's landings doubled while U.S. landings decreased 40 percent.

Audience Comment: Global demand for small pelagic species determines local price, which is also influenced by the timing, size, and quality of sardine landings. It might be possible to manage the fishery to deliver bigger, fatter fish to the market, adding value to the fishery. This would require a comprehensive marketing plan and a coordinated effort. Even in a regionally based allocation system, incentives remain for a “race for fish.” It is not clear that catch shares would solve the “race for fish” problem.

Speaker Response: Should not just be a seasonal allocation and fishermen should look more into niche markets. You need to operate year round to have niche market.

Audience Comment: Someone needs to find out exactly what Canada and Mexico is catching.

5. Catch Shares and Fisheries Management

Rognvaldur Hannesson, Professor, Norwegian School of Economics and Business Administration

Rognvaldur Hannesson began his presentation by pointing out that fish stocks are renewable resources that can in principle be sustainably exploited, however, he also asserted that variability in ecological and oceanographic conditions causes substantial fluctuations in fish stocks that humans can do nothing about. He attributed the achievement of sustainable exploitation to a question of limiting fish catches in order to keep fish stocks at reasonably healthy levels. He explained that there are two ways of limiting fish catches to achieve a target level, catch quotas and controls on fishing effort. Dr. Hannesson warned that catch quotas address the problem directly, but they must be based on reasonably accurate stock assessments. Effort controls, he cautioned, address the problem indirectly and therefore, are only effective when catch per unit of effort (CPUE) is proportional to the stock size which necessitates a condition of direct proportionality between fish stock size and density.

Dr. Hannesson explained that if conditions indicate quota control as the best approach, then dividing the total quota into shares, allocating these shares among firms in the fishery over a sufficiently long time horizon, and making the shares transferable makes sense. This management strategy of allocating individual shares averts incentives to compete and “race for the fish” and therefore, may alleviate unnecessarily short fishing seasons. He reasoned that transferability promotes efficiency; that is, better product quality, lower fishing costs, better matching of fleet capacity and available resources, and it accommodates technological progress. However, he warned that transferability

raises some thorny issues. First, Dr. Hannesson addressed the initial allocations issue by highlighting examples of options to consider; should quotas be sold, distributed by auction, or just given away to industry members? Related to this, is the question of who should get the rents that will emerge? Boat owners who have been given quotas have often gained handsomely for getting their quotas for free. Dr. Hannesson explained that this situation has caused resentment, even when the rents were generated by a better management system and not taken at anybody’s expense. He reasoned that because

rents reflect the productivity of scarce fish stocks, and their existence is a sign of a successful management, the issue of who should get them is an entirely separate issue and of secondary importance. However, he discussed fishery rents at length because of their controversial nature.

“Rent in the fishing industry is a sign of a successful fisheries policy. Rent is generated by good management; it does not come at anyone’s expense.”

–Rognvaldur Hannesson



Talking Points

○ *Sustainability and the Theory and Practice of Using Deterministic Models to Establish and Predict stock Harvest and Replenishment Levels*

- Sustainability of fish stocks cannot be controlled with great precision
- Catch targets alone are not sufficient to manage fisheries
- Fishery controls should have economic and environmental reasons in addition to biological sustainability reasons

○ *Small Pelagics*

- A big stock generally means that the cost per unit catch is less than a small stock
- Sardine catch has been small during some years due to environmental factors – not overfishing
- Fish collapses have been attributed to overfishing, environmental factors, technological advancements, etc.

○ *How to Limit Catches*

- Disadvantages of a direct approach to control output through catch quotas
 - Monitoring can be costly
 - Incentive to discard
 - Imprecision in stock assessments leads to uncertainty
- Disadvantages of an indirect approach to control input through effort controls (i.e., number of boats per days of fishing)
 - Invites substitutions and leakages (e.g., technology increases and gear and boat design changes)
 - Enables effort to increase through technological progress (i.e., the process of effort creep)
 - Creates management uncertainty in that fishery managers are typically reactive and behind in keeping up with the progress

- Argument made for effort control when stock assessment is imprecise
 - Uses proxy of one unit of effort equals catch for a given share of stock (e.g., a decrease in effort equals decrease in CPUE)
 - Restricts effort and limits catch of the stock
 - Assumes even distribution of the stock
 - Works badly when small stocks “contract” and occupy a smaller area (i.e., CPUE may not be changing with abundance)
- Argument made for tradable catch shares
 - Ends “race for fish”
 - Makes clear who can catch how much
 - Yields efficiency gains
 - Facilitates enforcement

○ *Thorny Issues of Individual Transferable Quota (ITQ) Systems*

- Initial allocation
 - Catch history a criterion
 - ◆ Translates to minimum interference with business as usual
 - ◆ Warrants exceptions for recent entrants who put in large investment
 - ◆ If catering to recent entries is a goal, resolve by adding exceptions to initial allocation (i.e., capital investment)
 - Last minute race to establish large catch history must be prevented
- Transferability
 - Short-term
 - ◆ Owners can lease their boat or their shares when quota is too low
 - ◆ If stock is rebuilding and capacity reduced:
 - ◇ Catch is decreased
 - ◇ Voluntary adjustments are made
 - ◇ Not all fishermen will remain
 - ◇ Those who leave get compensation
 - ◇ Effort creep is avoided
 - ◇ Excess capacity issue is avoided

- Transferability (continued)
 - Long-term
 - ◆ Match between fleet capacity and average stock yield
 - ◆ Accommodates technological progress (e.g., more efficient boat will need to buy more share)
- Rents
 - Drive investment and technological innovation
 - Indicate a fishery has been successful
 - Suggest increased market value of products due to sustainable, dependable stocks
 - Political support must come from the fishing industry
 - Who gets rent?
 - ◆ Government through taxes or auctions
 - ◆ Industry to provide incentives for better management
 - ◆ Some form of sharing between government and industry
 - What is in it for fishermen?
 - ◆ Share of the future rent, but this has not always happened
 - ◆ Security over rents in the future, but fishery participants must put pressure on the government to maintain
- *Example of How an ITQ System Could Play Out and Its Affinity for Political Swings*
 - Cause for action
 - Oversized fleet
 - Overfished stock
 - Implementation
 - Quota and catch cut back
 - Stock rebuilding progresses
 - Short-term outcomes
 - Some boats are profitable
 - Other owners exit by selling to those profiting
 - Quota price is low
 - Long-term outcomes
 - Stock recovers
 - Profits improve for those who in the fishery
 - Quota price increases
 - Entrants buy back in from “fat cats”
 - Political conundrum is that there is success and there is resentment
- *Icelandic Quota System*
 - A system on the brink of failure over resentment of “fat cats” and success of some, but not all participants
 - Plans are in place to take back quota from industry over a 20 year period
 - Rents accrue to the government
 - Fast politics at play in Iceland
 - Lesson to gain is that people should be cautious of the power of political swings
 - Advice is “do not throw the baby out with the bath water” during management changes

Conclusion

- Many fish stocks are overexploited
- Necessity is the mother of invention
 - The 200 mile zone a response to this
 - Has made it possible to introduce fishing rights
- Little doubt that transferable quota shares are the best way to go if
 - Stock assessment reasonably accurate
 - Sufficiently cheap to implement

General observations and conclusions regarding fisheries management and catch share programs.



Question and Answer

Q: Is there significant catch outside the U.S. EEZ? Europe's cap and trade made good money for the traders but has done little to decrease emissions, so why would we emulate that system?

A: Middle men are needed and are useful mediators in many industries. In the oil industry, these mediations have provided an effective means of rent capture through taxes on transfers. The lack of decrease in emissions has less to do with tradability than the regulation of overall emissions.

Counterpoint: Quotas do not go to the most efficient, but to the most wealthy (e.g., capital from outside the fishery)?

Audience Comment: Initial allocation is a thorny issue and can result in a loose allocation due to the system gaming that takes place during the process.

Speaker Response: The issue is not the trading or tradability. If you set allocation (emissions) shares too high, then it takes political will to confront a reduction. Traders are like real estate agents; they are useful, competitive and offer valuable service. Many will use open markets to find and elicit closed markets. Best way to resolve initial gaming for allocation is to set a control date for the fishery.

Q: Did Norway set a control date for catch history? How did that happen?

A: Catch history was used. It usually took place over a short time frame. Several methods can be used.

Rigging



Q: In many fisheries, demand is not as high as oil and market value is not as high as oil. The fishing industry is generally less pliable than the oil industry, so how was the oil example relevant?

A: Oil is a limited resource. It has a lot of value, which has made a tax system work. Limited profit of fisheries makes a tax system less likely to happen.

Audience Comment: In South Africa, processors have shares. The United States is a lot different from other countries.

Speaker Response: The U.S. regulatory system is designed to deal with lawsuits. Therefore, yes, fishing in the United States operates under a different framework than other fishing cultures. However, differences in regulatory systems operating in different countries should not be an argument against ITQs. ITQs involve a measure of tradability. Whatever the driving principles of the system are to start with, the system will become modified by those principles. There is no idiosyncratic management set-up for how to implement ITQs. In some countries, ITQs are administered by industry itself as are limitations on to whom and how the shares can be traded. From an economic perspective, limitations on transferability reduce efficiency, but can be a good way to deal with the political reality. For example, Alaska halibut has strict regulations on transferability. Economists would say this is not ideal, but the system is still good. “We shouldn’t let ideal systems get in the way of a good system.”

Audience Comment: Even though we know how catch shares should work, as shown in the presentation slide on *How systems should work*, in reality they do not. An example is Canada, capital in processing and harvesting moved to buy up shares. In this process, the market value went beyond rationale and the windfall was a falsehood. Inability to realize the quota value was falsely represented by the markets and resulted in a capital scarcity for processing and infrastructure support. Consolidation also went beyond what was rational to make up the difference. Harvesters turned into processors and vice versa to pool the amount of capital needed to succeed.

“We shouldn’t let ideal systems get in the way of a good system.”

–Rognvaldur Hannesson

Speaker Response: It has often been found in ITQ cases that overcapacity existed in all aspects of the fishing industry. There should be confidence in the ability of the free markets to address these problems and take care of them over the long run. For example, if plants burn down, it may be best if they are not replaced and the capital will be redistributed over the long term. However, the short term ramifications may be hardships—no system is perfect. Vertical integration is not necessarily a bad thing. For example, aquaculture has had success because of vertical integration. The argument that ITQs will be too capital intensive is not a convincing one.

6. Rights-based Management Program Variety

Amber Morris, Policy Analyst, National Marine Fisheries Service, Southwest Region

Amber Morris provided an overview of different types of rights-based management programs. She explained that strengthening resource users' incentives to promote both economic efficiencies and stewardship are the primary undertakings of all rights-based management approaches. Drawing from the NOAA Catch Share Glossary, she defined distinguishing characteristics of different types of rights-based programs and emphasized that catch share programs represent more than just ITQ systems (see Appendix D: NOAA Catch Share Glossary).

Ms. Morris presented a typology for classifying rights-based management programs along two continua: 1) the degree to which privileges of rights-based programs are held by the government, shared with resource interests, or held by the resource interests or users; and, 2) the geographic size of the management unit in which resource access and share trading may occur. Ms. Morris asserted that the design of program components such as permit duration, specification of the management unit, transferability, etc., ultimately defines permit holders' privileges to the resource and its management. The wide range of alternatives available for each program component has enabled flexibility in the design process which, in turn, has led to a wide variety in program types.

“Catch Share systems include a wide variety of different program types, not just ITQs.”

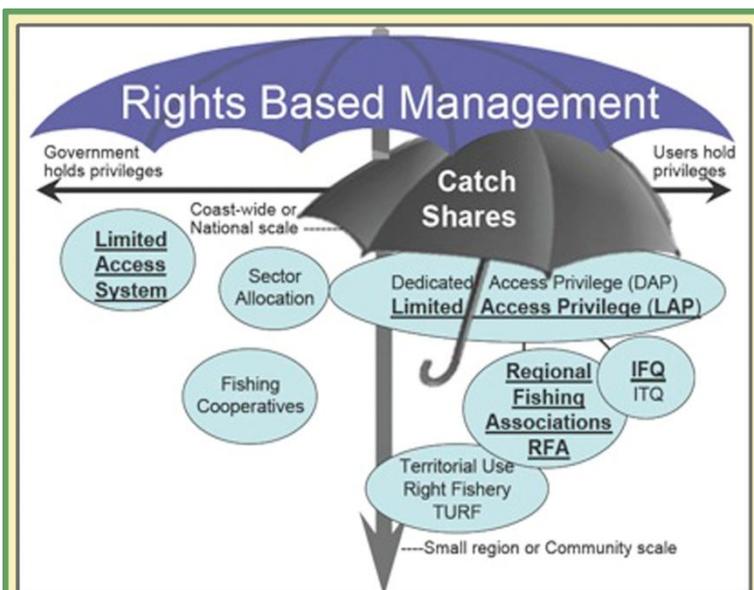
–Amber Morris

Talking Points

- *Rights-based Management in the United States*
 - Involves the distribution of privileges (i.e., use rights as a set of privileges)
 - To the resource interests or users (i.e., members of industry, other users or conservation interests)
 - To be shared between the government and the resource interests or users
 - Privileges can include:
 - Enhanced decision-making power over access to the allowable catch
 - The ability to sell and transfer fishing permits
 - Use of the term privileges in the U.S. as opposed to rights, recognizes that:
 - Inalienable rights to public resources cannot legally be granted to fishermen
 - Privileges obtained by the resource users participating in catch share programs have the ever-present possibility of revocation by the government
 - Responsibility for the security of public trust resources remains with the government

○ Rights-based Program Typology

- Conceptual framework used to classify program types
- Management programs considered as sets of fishing privileges that can be organized along two scales (or axes)
 - Decentralization Scale: privileges are either devolved from a central authority (e.g., government) to fishery participants (e.g., resource users) or vice versa
 - Geographic (or jurisdictional) Scale: eligibility to obtain and trade fishing privileges can be defined at a national, coastwide, regional or community scale



Fishery management programs loosely ordinated to a two-scale typology with a scale of decentralization along the horizontal axis and geographic scale along the vertical axis. The bold and underlined font represents program definitions from the 2006 Magnuson-Stevens Act.

○ Rights-based Program Terminology

- Limited access system (commonly referred to as limited entry program or LEP)
- Limited access privilege (LAP)
- Dedicated access privilege (DAP)
- Individual fishing quota (IFQ or ITQ)
- Regional fishing association (RFA)
- Sector allocation
- Territorial use right fishery (TURF)

○ Catch Share Design Components

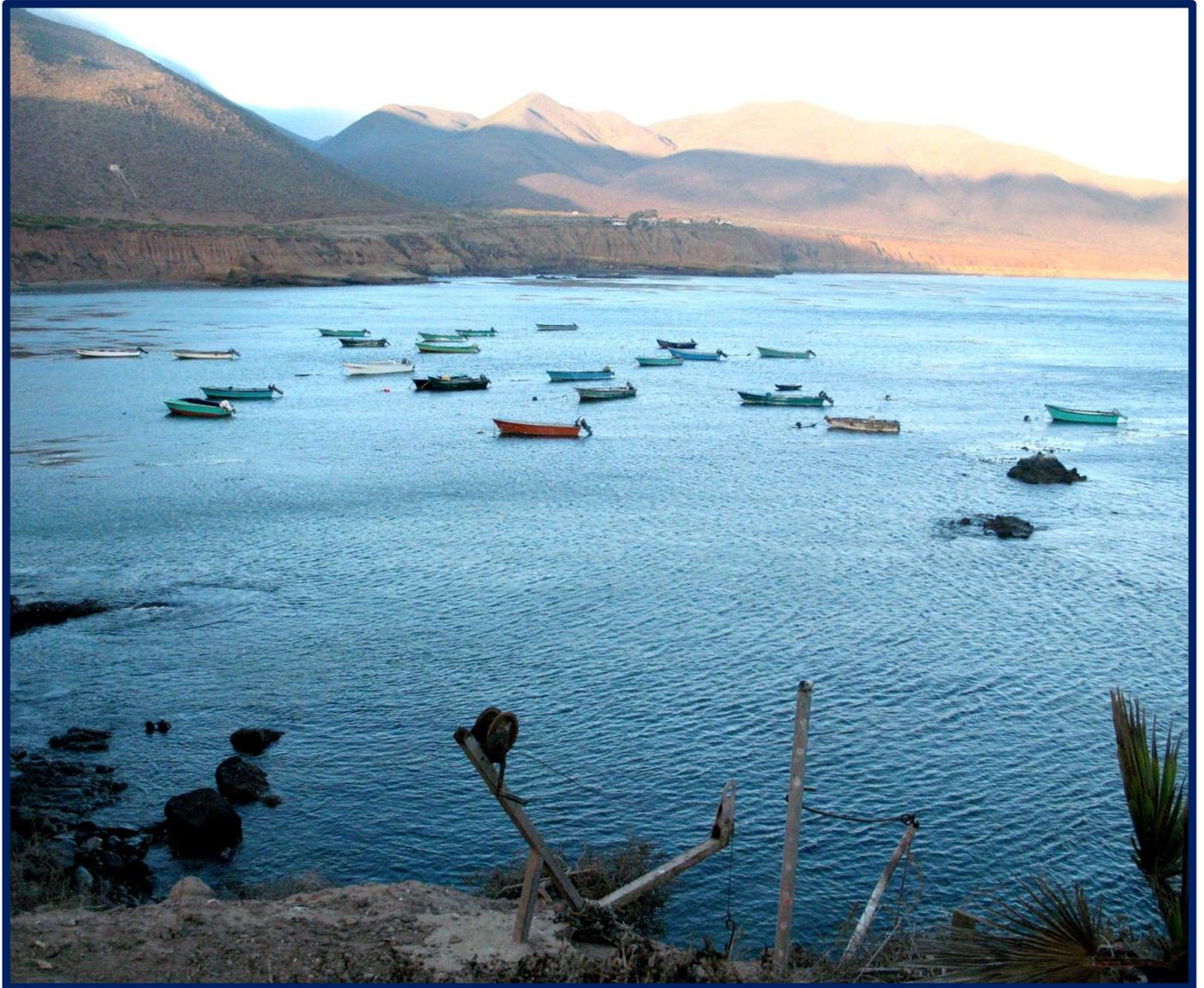
- Seven design components explored⁴
 - Program or permit duration
 - Specification of the management unit
 - Denomination of privilege units
 - Eligibility to acquire or hold privileges
 - Privilege transferability
 - Determination of excessive shares
 - Initial allocation
- Process and criteria used to define these components will describe the extent to which privileges are:
 - Devolved from government to resource users
 - Shared between government and the resource users

Question and Answer

Audience Comment: Pollock Cooperatives in Alaska are defined differently. They are described in the American Fisheries Act as entities eligible to harvest and allocate quota.

⁴ The seven catch shares design components are defined on pages 27-72. Their interrelationships are explored on pages 72-78 of the Anderson and Holliday Technical Memorandum (Anderson and Holliday 2007), "The Design and Use of Limited Access Privilege Programs."

Baja, Mexico fleet



B. CASE STUDIES OF CATCH SHARE MANAGEMENT

This session of the workshop focused on fisheries where rights-based management was introduced or is in operation. Biologists, economists, social scientists, and fishery managers with first-hand experience in the design, implementation, and evaluation of these programs presented their respective case studies (Appendix C: Speaker Biographies). The presentations included lessons learned and similarities and differences between U.S. Pacific coast CPS fisheries and those in other places in terms of their physical, ecological, economic, and political environments.

1. U.S West Coast Groundfish Trawl Rationalization

Jim Seger, Fishery Economics Staff Officer, Pacific Fishery Management Council

Jim Seger provided a brief overview of the history of the Pacific Fishery Management Council's consideration of groundfish limited entry programs, the core structure of the trawl rationalization program, and some of the lessons learned pertaining to the impacts of limited agency and Council resources on the policy development process and the impact of "who sits around the table" on the policy developed. Mr. Seger addressed the problem of "complexity creep" and some of the causes. He also discussed challenges that may be encountered in reaching a final Council decision.

Talking Points

○ Groundfish: Whiting and Nonwhiting Fishery Sectors

- Whiting is the bulk of groundfish landings
- Limited entry trawl and fixed gear is rationalized

"The impetus for the non-trawl, limited entry rationalization was the occurrence of a derby-style sablefish fishery that lasted as few as five days. Motivations for the trawl rationalization were to reduce bycatch, and stabilize and improve fishery and community economics."

–Jim Seger

○ Management Timeline for Groundfish

- 1984, IFQs first mentioned
- 1989, survey showed 80 percent opposition to catch share programs by industry
- 1991, sablefish IFQ development began
- 1996, moratorium on IFQs established with the 1996 Sustainable Fisheries Act amendments to the MSA required creativity in addressing the issues
- 2002 moratorium was lifted

○ Fixed Gear Sablefish Permit Stacking Program

- Developed under the 2001, Amendment 14 to the Groundfish FMP –first IFQ program for Council
- Shares with limited transferability

○ Trawl Rationalization Program

- Motivation was to reduce bycatch, stabilize and improve the fishery and community economics
- IFQs were identified as a tool for bycatch mitigation in Amendment 18
- Trawl vessel permit buyback program took place in 2003
- Amendment 20 started trawl rationalization



○ *Policy Changes in Non-whiting*

- Catch based, not landings based
- 100 percent at sea observer coverage
- Industry expected to pay monitoring costs
- Rationalization expected to help industry fund at-sea coverage
- Permit stacking not accepted but considered
- Determined that not enough benefits could be expected to warrant limited transfers

○ *Lessons Learned*

- Issues leading to complexity creep
 - Long process makes it likely players will change
 - Familiar players continue to design new options
 - New options put on the table late in the game create obstacles to reaching final decisions

Contributors to Complexity Creep

Everyone starts out wanting the simple.

- Simple rules cut an even swath
 - The more diversity in the fishery the more likely it is that varied circumstances will need to be addressed by additional details in the rules.
- The familiar seems simple.
 - The more a group works with something, the greater the temptation is to take a second look to see how it can be made better.
 - Familiarity makes it easier to add a new wrinkle without realizing the challenges to those who are unfamiliar and trying to understand for the first time.
- Advocates for new wrinkles often don't see their addition as adding that much to the program relative to the benefits.
 - Straw and camel's back problem: after it gets too heavy, which straw should be removed?
- "Make it better now; we might not get back to it"
 - Sometimes "bells and whistles" could wait but there is concern that resources and priority won't be there to support future consideration.

Jim Seger identified "Complexity Creep" as a series of process issues that can slow the development of catch share programs and present key obstacles to implementation.

Trawl Groundfish Sectors

Sectors	Status Quo Management	Rationalization Program
Shoreside – Nonwhiting	2 Month Cumulative Limits	Combine Sectors Single Shoreside IFQ Program
Shoreside – Whiting	Olympic Fishery	Harvester Co-op Processor Permits
Mothership – Whiting		
Catcher Processor– Whiting	Self Organized Co-op	Preserve Entry Barrier

A comparison of status quo and rationalization program management of groundfish trawl sectors. Rationalization provides an option for harvesters to either join a co-op or access a set-aside.

- Who sits at the table makes a difference
 - Quota committee established as trawl individual quota committee and included industry, commercial, environmental interests
 - Individual bycatch quota originally included
 - Quota for adaptive management set aside included
- Problems with agency resource limitations
 - Hard to maintain solid personnel and fiscal commitments
 - Agency must work strongly with design committee
 - Industry needs agency guidance
 - Agency needs to vertically communicate; limited participation results in time spent rehashing

Question and Answer

Audience Comment: The development of the trawl program story involved a great deal of things going on outside the Council process.

Audience Comment: Speaking from personal experience, there were a lot of long, protracted side meetings and other work to do outside of Council meetings during my participation in the trawl rationalization program development process from 2003-06. Without the means to afford to attend all of them, one is put at a disadvantage. "If you participate, you need to stay all the way to the end" because new elements can and do come into play right up to closing.

Q: Besides the catch share program in the beginning, where will money come from and what will the benefits be?

A: Getting benefits to offset costs can be achieved by "getting value out of the fish left in the water." There is also regulatory flexibility to reconsider markets for target species. A lot of target species are not accessed; fishermen will now find a way to do this. A study showed up to 14 million dollars in benefits for some sectors.

Q: What were the costs to Council?

A: Administrative cost was approximately 2 million dollars over last 6 years.

Float line and seine



2. Rights-based Fishery Management in Chile

Julio Peña-Torres, Professor, Department of Economics and Administration, University of Alberto Hurtado

Julio Peña-Torres described the development of rights-based fishery management in Chile. The programs started to be introduced during the early 2000s. In the case of most industrial fisheries, company-allocated and operationally transferable among firms percentage-catch quotas have been in place since early 2001. A 12-year time validity horizon established an expiration date for the programs. The initial quota allocation was based on historical fishing presence. In the case of small-scale, artisanal fisheries, percentage catch quotas were based on historical fishing presence and allocated more gradually at the fishermen's organization based level. In the artisanal sector, quota allocation programs gave fishermen's organizations discretionary powers for deciding how to distribute, use and control each organization's allocated quota among its members. Dr. Peña-Torres reviewed: (1) how these different right-based management programs were implemented; (2) the different timetables involved; (3) the main interest groups that participated in the negotiations for deciding how and to whom to assign catch quotas; (4) the political compromises finally achieved; and (5) evidence about (i) production-related effects observed in different fisheries (including small-pelagic fisheries) and (ii) ex-post perceptions about right based management schemes from different groups of fishermen.

Talking Points

- *Motivation to Transition to ITQs*
 - Conservation and management problems in the fisheries
 - Creation of the new Fisheries Law (took 15 years to enact)
 - Expansion in the artisanal fleet
 - Production crisis
 - Biomass and yield declined in northern fisheries in the 1980s
 - Many boats moved south with open access
- *ITQs for Industrial Fleet*
 - Legal rights given to quota owner
 - Catch quotas assigned to firm by fishery units, which can be species, area, and particulars of the fleet (subject to limited entry)
 - Ownership transfers forbid by law, but companies may freely join and decide how to use quotas whereby fishermen organizations holding collective quota are given discretion to allocate
 - Initial Allocation based on historical participation
 - Landings and storage capacity (1997-2000) used for some
 - Landings alone (1999-2000) used for others
 - Metric hold capacity factored in to allocation scheme for pelagics

- *Political Economy and Rent Taxation*
 - Lump sum license payments gradually introduced regardless of catch made in a given year (i.e., all permit holders paid).
 - Government generated rent of 10-20 million over a four-year period
- *Program Design Different for Artisanal Fleet*
 - Provisions established for small scale sector through tax breaks, waiver of license fees (i.e., not paid annually), and less regulation
 - No specification created for management unit, at first; spurred some growth in capacity
 - Set aside for small scale artisanal only zone five nautical mile (nm) off coast
 - Formal procedures developed for how people joined organizations
- *ITQs: February 2001 valid until December 2012*
 - Granted a 10-year (2002-2012) program extension
 - Developed a dual system with different rules and regulations and speed of change for industrial versus small boat sector
- *Controversy Over the Initial Quota Allocation*
 - Instituted a gradual implementation philosophy
 - Industrial sector initial allocation was only for two years (2001-2002) because a lot of people did not join the management scheme
 - People did not want job loss in small scale sector
 - A law was passed to prohibit ownership out of fears for consolidation
- *Gradual Changes in the Artisanal Fishing Sector*
 - Small fishing groups and artisanal fishermen grew interested in obtaining a percentage of the catch quota
 - Market movement pushed for the freedom to decide
 - Law allowed fishermen to voluntarily join
 - Freedom in how to use quota created for program (i.e., collective quotas were assigned to fishermen organizations)
 - Fishermen voluntarily decided some transferability

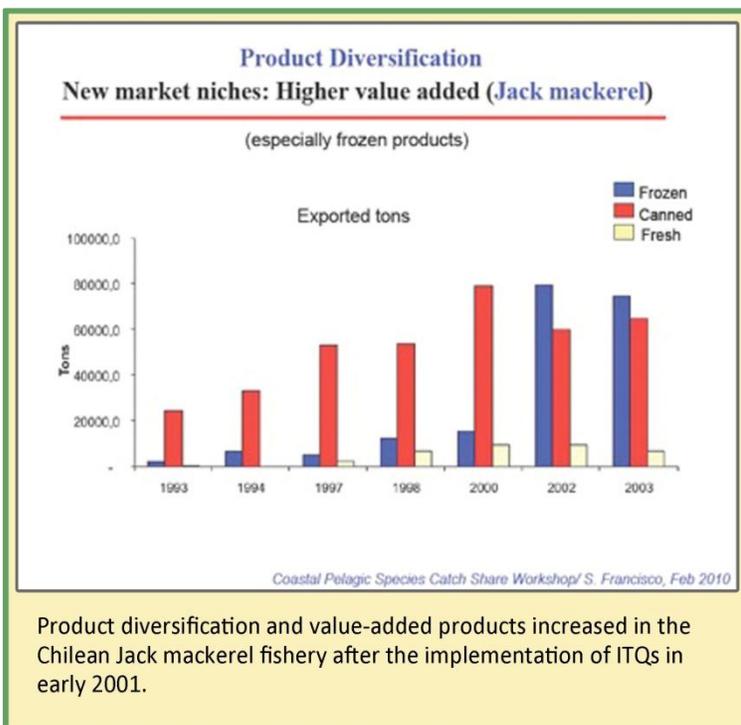
"People did not want to see job losses in the small scale sector. A law was passed, out of fear of consolidation, to prohibit quota ownership. However, gradual changes later occurred (in the sense of gradually introducing de facto partial or restricted ownership rights over catch quotas) as small fishing groups and artisanal sector became increasingly more interested in obtaining a percentage of the catch quota and the market pushed for freedom to decide."

-Julio Peña-Torres



○ Effects of Management Schemes (Austral Hake)

- 75 percent of all Chilean landings covered under some form of an ITQ system
- Fishery has gross value of close to 500 million in exports
- Comparison of ITQ management versus non-ITQ management
 - Model stretched over 20 year time span
 - Results indicated that cost of management with ITQs were less than without ITQ
 - Model showed future benefits from value added and product diversification (i.e., increase in frozen products)
- Survey of fishing industry perceptions
 - Fishing effort is more cost-effective
 - Market prices have increased
 - Quota management has been more effective



Question and Answer

Q: Was there a reduction in the industrial fisheries? Did it include the small-scale sector?

A: Yes, for small pelagics, the number of purse seine vessels built decreased with reduction in licenses and capacity. Yes, reduction was a part, but how processing changed after ITQs were implemented was key.

Q: Where did the investment money come from for the fishery?

A: The new system increased rents for industry. Private sector contributes 75 percent toward cost recovery. Government funded some investments in the fishery.

Q: Is that the cost of quota?

A: Pretty much.

Q: What defines an industrial fishery?

A: The size and capacity of the vessels.

Q: Is there vertical integration?

A: For the most part – yes.

Q: Are shares transferable?

A: Shares are allocated to each company; it's written in the law. The quota right itself is not transferable, but you can rent or joint venture. You could buy vessel(s) to obtain higher quota.

Q: How did people decide to ante-up for cost recovery in the artisanal fishery? Was fishing research privatized?

A: Enforcement was privatized. There are two main private sector research institutes that are fully funded by the private sector. One institute solely works on small pelagics.

3. Namibian Fisheries Management and Individual Catch Quotas

Rashid Sumaila, Director of the Fisheries Centre & Fisheries Economics Research Unit, University of British Columbia

Rashid Sumaila described the Namibian fisheries management system which has been in use since the country gained independence in 1990. The system has helped the West African country to achieve successes where many countries have failed miserably. An important part of this management system is an individual quota catch allocation system. Namibia has been cited a number of times as a country that does a reasonably good job at managing its fisheries resources. It is one of the few countries in the world that has been able to extract significant amounts of resource rent from its fishery resources over the years. This achievement is significant given that most maritime countries are getting negative resource rent from their fisheries through provisions offering perverse incentives such as harmful fishing subsidies.

Talking Points

○ Fisheries of Namibia

- Country shares an ecosystem with two adjacent countries: Angola and South Africa
- Country has only two landing ports
- Main economic sectors are mining, fisheries, and agriculture (in that order)
- Fisheries are almost all commercial
- EEZ contains about 20 commercial species
- Key commercial species are hake, pilchard, and horse mackerel
- Demersal fisheries comprise 70 percent
- Fishing sector accounts for 1.8 percent of total labor force (i.e., about 14,000 people)
- About 277 licensed vessels with 480 million worth of landings (2007)

○ Fisheries Management

- Ministry of Fisheries and Marine Resources
- Marine Resources Act of 2000
 - Requires access to quota to commercial fish
 - Must pay fees even if quota is not reached (intended to stop people from holding quota however; fishermen are very perplexed by this notion)

○ Main objectives for fishery management

- Limit sector to protect fish and sustain operations
 - Rights cannot be permanently transferred
 - Participation by previously excluded people expected to increase (i.e., policy)
- Use an ecosystem approach
 - Decisions based on stock and ecosystem science
 - ◆ TACs determined with single species models
 - ◆ TACs entered into ecosystem models for insights
 - Time-area closures and exclusive use zones
 - ◆ EEZ closure area of 300m or less
 - ◆ Exclusive access area between 300-350m in EEZ for wetfish trawlers based on rationale that they contribute more environmental impact
 - ◆ Seasonal closure for protection of spawning stock
- Strong monitoring and surveillance system
 - High fine fee system
 - Observers paid by industry
 - Not easy to bribe or harm observers
 - ◆ Land, sea, and air observations
 - ◆ Two observers per boat

○ *Main objectives for fishery management (continued)*

- Design rights to meet socio-economic objectives of Namibians
 - Imposed an eligibility requirement of 90 percent Namibian beneficiary in ownership
 - Captured a good chunk of the resource rent through license fees (to hold quota), quota fees, bycatch fees, and marine resource research fund levy
 - Established co-management with Fisheries Advisory Council
 - Developed a tiered rights system (i.e., permit duration increases with Namibian dependence)
 - ◆ 10-year right requires 50 percent Namibian ownership of vessels
 - ◆ 15-year right requires the firm to employ 500 people with a number of fees and levies charged (i.e., quota fees, research fund, bycatch fee, license fee)
 - ◆ Firm can be foreign-owned

○ *Experience*

- System seems to be working, with more previously disadvantaged Namibians earning a living from the sector
- System has supported the effort to sustainably manage the country's marine resources

“The decision of whether the resource rent is kept by individual households or by the nation is a decision for society. In Namibia, the nation has captured a good chunk of the resource rent.”

–Rashid Sumaila

Question and Answer

Q: What countries make up the foreign ownership?

A: Mostly Western Europe (Spain) and former Soviet Union

Q: Is there vertical integration?

A: For wetfish – yes, but not for freezer operations.

Q: Are there pelagic trawlers?

A: Yes, mostly trawlers and longliners

Audience Comment: “Great to see shore-based processors”

Response: There is a 60-40 onshore-offshore target for hake.

Q: Do you have any comments on resource rents and differences among countries?

A: Depends on country and context. There is variation on who keeps rent.

Q: In regard to area closures, how do you monitor where vessels are?

A: Diamond mining is located within 200 mile zone and that industry helps to monitor and control fishing practices along depth contours.

Fishing rights designed to meet socioeconomic objectives

- Fishing rights cannot be permanently transferred
- Namibianisation policy:
 - Increase participation by previously excluded Namibians
- Emphasis on onshore processing
- Co-management:
 - Fisheries Advisory Council established to advise minister on a wide range of fisheries related matters
 - Members of the Council include Industry via organized associations; labour unions; NGOs, etc



Key elements and processes of Namibian policies for rights-based fisheries management that were designed to achieve socioeconomic objectives.

4. Assessment and Management of the South Australian Sardine Fishery

Tim Ward, Associate Professor, Principal Scientist and Program Leader (Wild Fisheries), South Australian Research & Development Institute (SARDI), Aquatic Sciences

Tim Ward discussed the performance of the South Australian sardine fishery under a system of TACs and ITQs. Fishermen and managers agree that the system facilitates better economic outcomes than competitive quotas. Dr. Ward described the South Australian Sardine Fishery (SASF) as the largest fishery in Australia. He explained that the SASF was initially established to provide fodder for the tuna mariculture industry, however, an increasing proportion of the catch was being value-added for use as pet food, recreational fishing bait and human consumption. The developments enhanced the economic benefits to both license holders and the broader community. Dr. Ward reasoned that the allocation of an equal ITQ to each license holder facilitated this development by ensuring that those license holders wishing to pursue alternative markets can access fish throughout the year, which may not have been possible under a competitive quota system. The ITQ system, by allowing license holders to take small catches of high quality fish, enabled fishermen to maximize the price they received for their product, without being disadvantaged as they would if their share of the total catch was not guaranteed.

Talking Points

- *SAFS Operates in the Flinders Current System (i.e., a northern boundary current)*
 - Includes 14 licenses
 - Incorporates a TAC and ITQ system
 - Harvest resources with purse seines
- *SAFS Operates in the Flinders Current System*
 - Accords with Fisheries Management Act 2007
 - Employs cost recovery mechanisms (90 percent the Wild Fisheries Division's 5 million dollar funding is from cost recovery)
 - Strives to meet ecologically sustainable development (ESD) management objectives: to achieve sustainability and maximize economic and social benefits
- *ESD Fisheries Goals*
 - Sustainable Harvest
 - Enable harvest over long-term
 - Monitor performance indicators (i.e., diet studies determined predator-prey linkages)
 - ◆ Example: Success of crested terns correlate with mass mortalities in sardine populations
 - ◆ Tern reproduction rates tend to be higher in times of high sardine biomass
 - ◆ Tern reproductive success declines with low sardine biomass conditions
 - Minimize ecological impact
 - Minimize impacts to structures
 - Minimize impacts to endangered species and protected resources
 - ◆ Industry produced a code of practice (level of interactions acceptable to community)
 - ◆ Observer program helped minimize these interactions

○ *ESD Fisheries Goals (continued)*

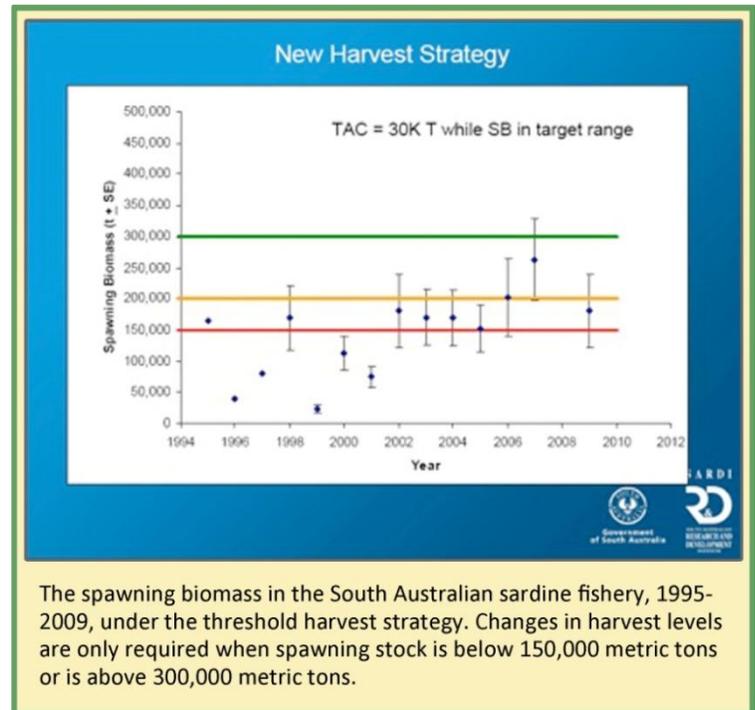
- Optimal Utilization
 - Improve efficiency
 - ◆ High volume, low value is not an option for Australia (i.e., it is not as windy as the West Coast of the U.S. therefore, not as productive)
 - ◆ High value products possible with ITQs
 - Maximize social and economic benefits
- Cost effective management
 - Promote co-management
 - Ensure compliance

○ *Management Plan Established in 2005*

- Annual stock assessments conducted
- Interactions with protected species considered, for example, common dolphin bycatch reduced by 90-95 percent with gear and behavior oriented mitigation measures
- Initial harvest strategy varied percentages according to projected spawning biomass
 - TAC was always changing and creating market instability
 - ◆ When TAC decreased, quota value would go down and price would go up
 - ◆ When TAC increased, quota value would go up, but price would drop
 - Workshops were held to address sustainability in the face of stock size and price fluctuation

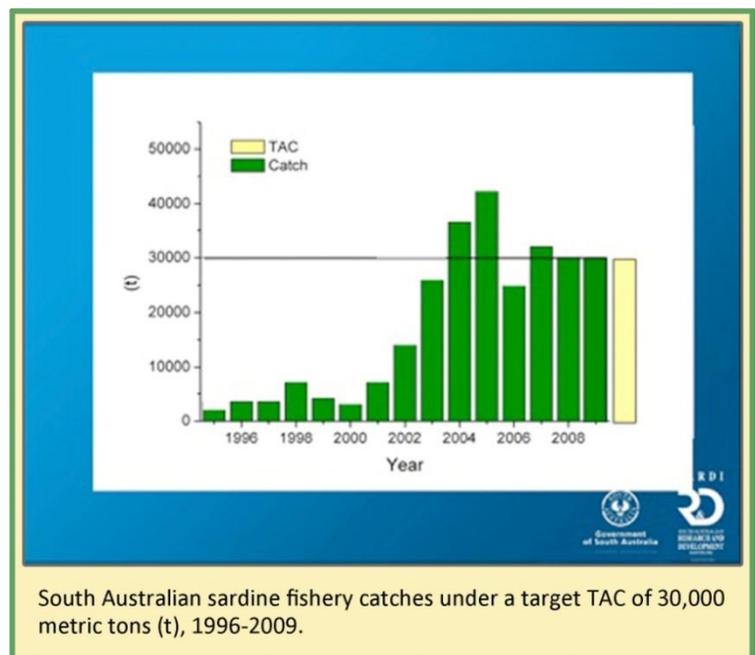
○ *Current Harvest Strategy was Adopted for Market Needs*

- Targets stability instead of yield
 - Fishermen elected the strategy
 - Fishermen considered imprecision in stock assessments and quota-price offsets
- Sets spawning biomass thresholds between 150,000-300,000 tons
- Targets a TAC of 30,000 tons, about a 15 percent exploitation rate



○ *Management Process for Current Harvest Strategy*

- Review harvest strategy annually
- Change TAC if stock level appears above or below range (teases out fluctuations)



○ *Benefits of ITQs and the Alternatives with a Competitive Quota Fishery*

- Benefit: allows a low risk, low cost, high price and high profit strategy (i.e., due to certainty of ITQs)
 - Alternative: high operating costs associated with higher research needs for higher risk higher catches
- Benefit: enables planning for entire season (i.e., control of market supply)
 - Alternative: reduced profitability with catches being sold in higher quantities early in the season
- Benefit: allows diversification and value added
 - Alternative: inconsistent supply narrows market opportunities and economic benefits to the fishing community
- Benefit: supports operation costs and research with increased prices
 - Alternative: few harvest options are available when prices are low and management costs to support higher, riskier catches are high
- Benefit: improves public image of fishing industry in the sense that they are only catch what is needed
 - Alternative: high risk industries which aim to maximize yield appear wasteful in the eye of the public

○ *Problems of ITQs*

- Removes the competition driven lure of the fishing lifestyle (i.e., drive to be highliners and earn respect of peers)
 - Some fishermen would rather leave the fishery open access and less restricted
 - Competitive drive would be better steered towards profit margin victories than catch total margins
- Initial allocation of ITQs can have problems
 - Less of an issue in Australia because competitive quota fisheries are not enforced
 - At first, realized strategy was good for growing fishery opportunity, but then realized that the opportunity was unstable
- Cost recovery

○ *Parting Thoughts*

- Allocation is just plain going to be difficult
- Advice from lesson learned...
 - Establish an independent allocation panel
 - Come up with a model and apply it
 - Establish an appeals process
 - Keep in mind that a major benefit of catch share systems is that they adapt over time

“Fishermen can’t think in the way they need to think to achieve these goals (low risk, low cost, high price and high profit strategy) in a competitive quota fishery”

–Tim Ward



Question and Answer

Q: You need to decrease the number of fishermen to increase price – how will consumers pay this increased price?

A: You need to make it economically viable for participants and industry must decide how to maximize profits.

Q: Global market competition is driving down local participation and driving up prices. “How many people have to go out of business?”

A: In Australia, vertical integration and exporting help. New Zealand rock lobster fishery is a good example with live exports to Asian market to obtain higher per unit prices.

Audience Comment: It is very expensive to operate in the United States where fuel is currently at \$4 per gallon. These expenses are driving some people close to quitting.

Speaker Response: Diesel is more expensive in Australia; some fishermen are switching to onshore processing sectors.

Q: How vertically integrated is this fishery?

A: One of the bigger companies has four licenses and there are smaller ones catching throughout the year.

Q: Will anchovies be used to feed tuna instead of sardine?

A: Tuna prices (Japan) have gone down, so demand is low. The fisheries are starting to separate into two industries. Tuna farmers own CPS ITQ permits.

Q: Will there be an industry-driven switch from using CPS for tuna farm fodder to processing for individually quick frozen products? If so, will this change the age of fish being targeted? Since the fishery is close to shore, the product would be fresh and of high value especially targeting the 2-4 old fish.

A: That remains to be seen.

Q: What was the timeline to complete the process for the catch share program system?

A: About 100 people involved, several years to complete and ended up in court. 30 percent was given to people with existing licenses and 60 percent was based on catch history. Americans have good catch history. Do not just look at catch shares, but think about addressing some of the structural weaknesses in your fishery management scheme at the same time. Make a package change. This should only take a couple years to do, ITQs and quotas happen at the same time. Think about completing between 2 and 5 years as opposed to the 7 years for groundfish.

5. New Zealand Rock Lobster Experience with Property Rights

Tracy Yandle, Associate Professor, Department of Environmental Studies, Emory University

Tracy Yandle cautioned participants to think about the long-term effects a catch share program has on the fishery and those who work in the fishery, when considering whether and how to implement this policy option. She explained that she was neither an opponent nor proponent for catch shares, but believed that by carefully considering how the catch share policy is designed, participants can help craft a regime that will better meet their needs and the fishery's needs. After presenting a case study of the New Zealand rock lobster fishery, Dr. Yandle highlighted issues for participants to consider including: institutional design, how property rights are characterized, and conflicts between catch share rights and other forms of regulation and property rights.

Talking Points

- *Perspective and Purpose*
 - Introduce an analytical tool for considering property rights (i.e., property rights do not have a unitary meaning, but rather different elements)
 - Present events of fishery in property rights terms
 - Provide perspective on strengths and weaknesses of the program design
- *Rock Lobster Fishery*
 - Second largest seafood export industry in New Zealand
 - Small vessels, 1-2 fishermen per boat
 - Classic boom and bust fishery
- TAC and ITQ system is 20 years old
- Comanagement is layered on top
- Most stocks are stable with some indication of biomass increasing
- CPUE is trending upward
- Most ITQs are owned by vertically integrated processors that lease the ITQs to fishermen
- *TAC and ITQ System Design and Implementation Events*
 - Prior to 1991, effort controls resulted in part-timers being removed from the fishery with de-facto fishing rights generated for remaining participants
 - 1991, ITQs were introduced
 - Quota was initially allocated to fishers with high catch history; ultimately most went to processors
 - Quota was originally allocated by specific tonnage and then changed to percentages of the TAC which increased owners incentives to participate in management
 - 1992, Treaty Waitangi- native Maori's were given 12 percent of the allocation
 - Treaty decision helped solidify the legitimacy of the catch share program because ITQs were used as currency for decision-making and settlement
 - The ITQ was perceived as a real property right to industry, not just a permit

○ *Comanagement*

- 1994, legislation allowed co-management between government and fishing organizations
 - Groups of ITQ owners were authorized to participate in management as Commercial Stakeholder Organizations (CSOs)
 - Research for stock assessments became competitively bid
 - The Rock Lobster Industry Council started promoting bids to gather various sources of scientific data

○ *Property Rights as Management Tools*

- An ITQ system will introduce a complex new set of property rights
- Economic and biological operation of the fishery is likely to be altered as a consequence
- Design process of ITQ systems should consider:
 - The distribution of property rights in the extant fishery before ITQ introduction
 - How things might change under alternative catch share programs

○ *Property Rights as Analytical Tools*

- Useful for interpreting what individuals or groups will want to protect or hope to gain
- Rights include one or more of the following five characteristics of the Property Rights Bundle
 - Access: right to enter a physical area and enjoy non-subtractive benefits
 - Withdrawal: right to obtain resource units or products of a resource
 - Management: right to regulate use patterns and transform the resource by making improvements
 - Exclusion: right to decide who will have an access right and how it may be transferred
 - Alienation: right to sell or lease either or both of the access and withdrawal rights (i.e., exclusion and alienation are somewhat esoteric)

- Rights define the level of engagement (e.g., need a minimum of claimant status to have incentives to conserve)
 - Owner has all five rights
 - Proprietor has access, withdrawal, management, and exclusion rights
 - Claimant has access, withdrawal, and management rights
 - Authorized user has access and withdrawal rights (i.e., traditional fishery management)
 - Authorized entrant has access rights
- Rights have three dimensions
 - Temporal: duration of rights
 - Spatial: where the activity takes place
 - Quantitative: how well defined

○ *Using the Property Rights Bundle to Describe New Zealand Management Challenges- Leasing Quota*

- Good reason to think long and hard about design implications
- Retirement, selling out, etc. – bought out by processors that lease annually (i.e., Annual Catch Entitlements, ACE)
- Short-term – increase in operational costs
 - Fishermen cost to pay for lease is significant portion of gross
 - Contracts are stiff; quota is used to leverage and guarantee supply
- Long-term – incentive for quota owners to invest more in the market than the management
 - Fishermen are doing the research; spending the time and not necessarily reaping the benefits
 - Fishermen feel that they are the conservationists, but their incentives to conserve over the long-term are being impacted by their shorter-term leases
 - Contested science with competitive bids and industry data and analysis included

○ *Using the Property Rights Bundle to Describe New Zealand Management Challenges- Sectoral Conflict*

- Mismatches in the different property rights of different sectors (e.g., recreational fishermen, environmentalists, cultural groups, etc.) contributes to conflict
- Mismatches complicate negotiations by challenging people's ability to see eye-to-eye
 - Commercial sector feels most likely to experience catch limitations because their rights are quantitatively well-defined
 - Quota Owners (i.e., ITQ shareholders) have management and exclusion rights and effectively control the fishery
 - Leasers have little incentive for long-term engagement
 - ◆ Managers are concerned about high rates of leasing
 - ◆ Fishermen lose confidence in their long-term gains from conservation and management measures (e.g., rebuilding plans)
 - Recreational fishery is not in the property rights game
 - ◆ Their catches and their rights have not been well-defined
 - ◆ Recreational fishermen chose a political approach to allocation

○ *Using the Property Rights Bundle to Describe New Zealand Management Challenges – Spatial Conflict*

- The broadly defined region where people work may be reduced due to conflicts with other spatial use rights (e.g., recreational fishing, aquaculture, marine reserves, pipelines)
- Fishermen have well-defined rights
 - Rights vary in strength across users
 - Rights have been defended
 - Rights have been superseded

“Conflicts among different fishing sectors, recreational fishermen, cultural groups, and environmentalists exist in part because of the mismatches in the different property rights arrangements of the different groups.”

–Tracy Yandle

- Marine reserves displaced fishermen and the consequential spatial shifts in fishing effort increased pressure on stocks in areas left open
- TACs were more prone to decreasing as a result
- Loss of patches of fishing ground threatened to impact quota value

Closing Thoughts

- ▲ ITQs (or catch shares) are a complex, dynamic set of property rights
- ▲ ITQs fundamentally change the fishery
- ▲ Careful thought is needed on issues such as:
 - ▲ How are property rights presently distributed within and outside fishery?
 - ▲ How will distribution change this?
 - ▲ How will creating or changing property rights in other sectors influence fishery?
- ▲ By carefully addressing these issues up front there is a greater chance that institution will be designed to best meet all fishery needs



Insights on the interconnectedness of property rights issues in fisheries and advice for development of effective right-based management institutions.

○ Advice on Rights-based Approaches

- Take a big picture look at the implications (and ripple effects) of actions and how institutional arrangements will change
- Ask questions about how to make positive changes along different contextual layers...
 - How as a fishery...
 - How as a society...
 - Consider other uses outside the commercial fishery that may impact the spatial array of rights

Question and Answer

Q: How many processors are in New Zealand and what percentage own rock lobster ITQs?

A: There are a small number of large processors that tend to process all types of fish. An impression that is not supported by data is that there are four big processors that operate on a national scale and generally do not focus on specific fisheries. There are a few regional processors.

Q: Have property rights helped with court cases against other ocean users?

A: Fishing rights are not currently treated as property rights in the United States. Treating them as property rights might, in principle, give U.S. fishermen scope for suing the government to defend their rights to fish. In New Zealand, there was a declaration of property rights. That declaration has not always provided a solid defense against other users, but that is how the law is written.

Q: There is much concern about leasing rates and conflict between owners and leasers. From the property right perspective, is there anything that can help?

A: Maori fishermen sublease fishing rights to new entrants to the fishery. There is a problem of

lobster poaching, and those lobsters being bought by stores and restaurants for cheaper prices. From a property rights perspective, there is not much that can be done in terms of defining the rights. However, stakeholder involvement in the management side has had its benefits. Fishermen are highly involved with program operations and data collection. They created the No-tag No-sale program to oppose the illegally caught lobster in the market. Their work is sophisticated.

Q: It is interesting that the recreational sectors decided to opt for a more political strategy. Is recreational fish take capped?

A: No

Q: Is the recreational catch growing?

A: Yes

Q: Is that catch displacing commercial catch?

A: Yes

Q: We have marine spatial planning coming online. How might catch shares play out with that process?

A: In New Zealand, when an area is closed, fishermen cannot go in, and marine reserves have trumped ITQ fishing rights where they came into conflict. Best advice is to be diligent in how you define the ITQ right. Consider how it will be legally, politically and spatially codified. In New Zealand, if the right it is not well defined it does not exist.

Follow-up Comment: In South Australia, fishermen have negotiated with the government that dissipation of rights (i.e., expected benefits) should be compensated. Now, the government pays for effort (i.e., part of quota) that is eliminated due to spatial issues.

Follow-up Comment: In the United States, the property right is described as a “privilege”. “A property right is deeper than a privilege.”

Follow-up Response: Yes, in New Zealand this “is a right in perpetuity.” A defacto right can become a legal right, but there is no guarantee. Again, it is important to be careful with how things are defined.

6. Bering Sea Pollock Fishery Quota-based Catch Share Program

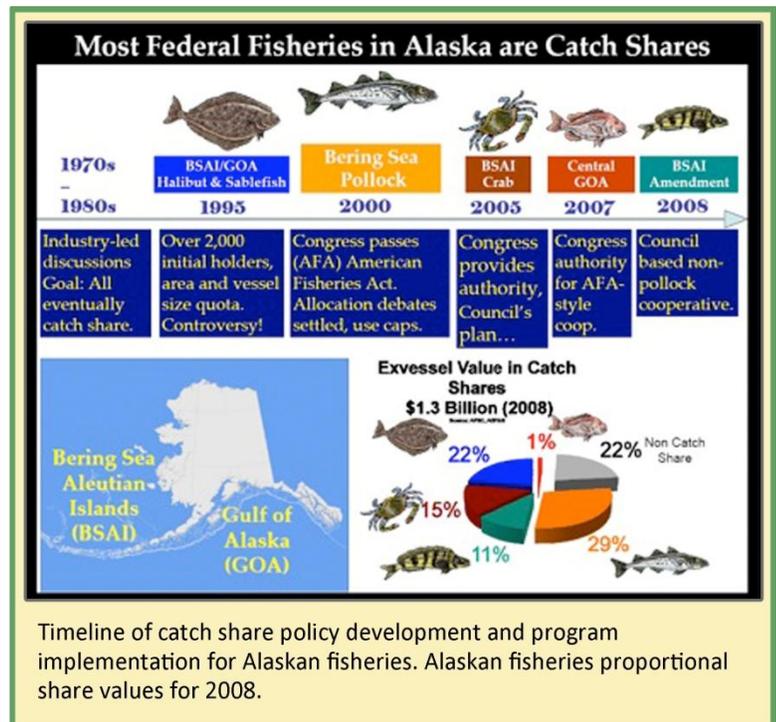
Glenn Merrill, LAPP Coordinator, Alaska Region, National Marine Fisheries Service

Glenn Merrill explained that approximately 85 percent of all North Pacific fisheries by tonnage and value are managed under exclusive quota-based catch share programs. The Bering Sea pollock fishery comprises the largest component of the catch share programs with total pollock catch of approximately 815,000 mt. In 2009, the estimated wholesale value of the fishery was 1.2 billion U.S. dollars. In 1998, Congress passed the American Fisheries Act (AFA) which proscribed the means for allocating Bering Sea pollock among various inshore and offshore industry sectors. Since the AFA's full implementation in 2000, the pollock fleet dramatically reduced the race for fish, increased the value of fishery products, and established private contractual arrangements for managing catch in other fisheries not under catch share management. The fleet has adopted inter-cooperative agreements to improve responsiveness to bycatch concerns. NMFS and the pollock fleet worked collaboratively and extensively during the implementation of the AFA to ensure a more seamless transition to catch shares.

Talking Points

- *Basic Structure of North Pacific Catch Shares*
 - Move to catch shares began in the 1980s
 - Initial allocation was based on historic catch
 - Long-term privilege is based on quota share
 - Quota share is valued as an exclusive harvesting privilege
 - Programs “grant user privileges not rights”
 - Shares are fixed to a vessel
 - They are transferable

- *Why ITQs in the North Pacific?*
 - Settle allocation disputes (inshore/offshore)
 - Reduce costs
 - Improve value
 - Increase safety
- *Most Fisheries in Alaska are Catch Shares*
 - Overfishing has not been a driving force
 - Fleet consolidation was not a driver



- *Pollock Fishery*
 - Pollock is a key species to sustain business
 - Largest U.S. fishery by value
 - 30 percent of groundfish value

○ *Pollock Fishery (continued)*

- Inshore sector consists of 98 catcher vessels, all of which participate in cooperatives
- Offshore sector consists of 21 vessels
- Motherships consists of 19 vessels, 3 are processing vessels

○ *AFA Passed in 2000*

- Settled the debate over the use of caps
- Involved Congress to form relationships between fishermen and processors (i.e., cooperative models), which involves significant legislation (e.g., AFA)
- Enabled allocation of TAC to Community Development Quota (CDQ) and sectors
- Established set aside (10 percent) for community CDQs
- Defined vessels eligible to target pollock, not specific quota
- Considered corporations to be “one person”
- Set excessive share limits in that no person may harvest more than 17.5 percent of TAC

○ *Catch Share Program Design Under the AFA*

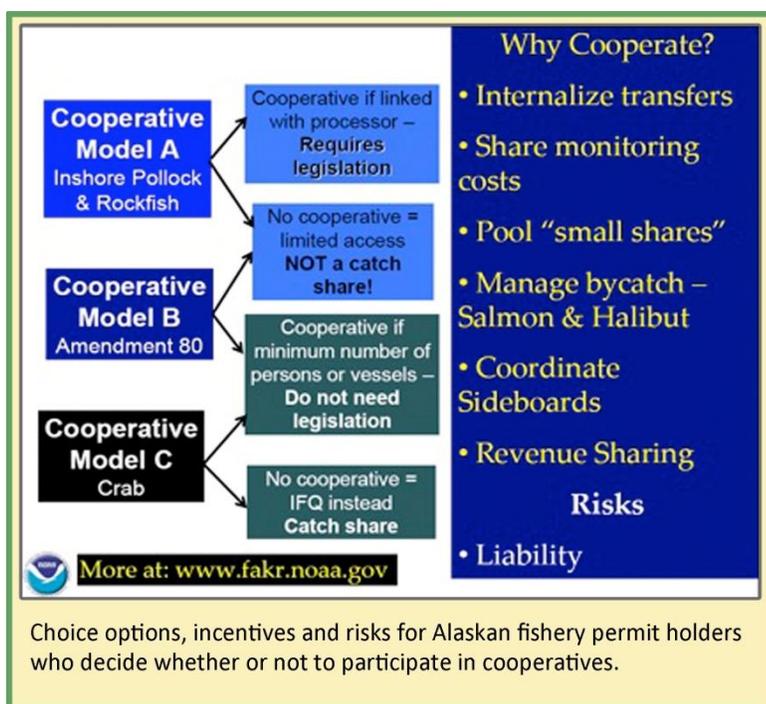
- Enabled CDQ members to self-allocate (typically based on participation with fishery for a given period of time)
- Allowed vertical integration for more security in fresh fish markets
- Required linkages to specific processors for the pollock inshore fishery

○ *Outcomes of Programs Instituted under the AFA*

- Ended the “race to fish”
- Increased the value of the fishery with shift from surimi to fillets

○ *Cooperative Framework*

- Share allocated to a person, but “the person” is a group which requires collaboration
- Participants chose to be in a Cooperative or Limited Access or an IFQ



“Fleet consolidation was not a driver for the Bering Sea pollock fishery program and there was not a dramatic shift in fishery participation during or after the implementation of the program.”

–Glenn Merrill

○ *Cooperative Pollock Management*

- Fleet consolidation has not been a concern
- Collaboration increased
- Monitoring expanded
 - Conducted by the state; watched by NMFS
 - Self-regulated; mostly by industry
- Bycatch limited; however, some concern over salmon bycatch

○ *Incentives to Cooperate?*

- Reduce costs to coordinate
- Increase coordination
 - Better reporting and communication
 - Pool resources to decide who will fish for what species and where

○ *Concerns or Risk Associated with Cooperation*

- Ensuring individual accountability
- Maintaining trust between members
- Devaluing shares (impacts of limited transfer)
- Differing values across cooperatives

Question and Answer

Q: Were buybacks included in the AFA timeline?

A: AFA did have a buyback program and it was a part of the license limitation process. Before the AFA, there was a groundfish moratorium program for permits, but it was not very limiting.

Q: How was the 17.5 percent determined?

A: Fixed by federal law. One harvester was close to that percentage and the program was not intended to force any divestments.

Q: Are processors getting shares and/or forming co-ops with harvesters?

A: The Council is still reviewing options. May allow harvesters to directly allocate to processors or allocate quota share directly to processors only if a certain number of harvesters enter the co-op and are linked with the processor. Co-ops are only realized on an annual basis.

Q: Why is Alaska and Gulf rationalization so different (timeline-wise to get done)?

A: The processes differ on issues of scale, number of processors, and the fishery value. The Gulf area has many participants and small businesses.



C. CASE STUDY PANEL ONE: AUDIENCE TO PRESENTERS

Following the case study presentations, the audience was given an opportunity to address the case study presenters as a panel to answer any additional questions and clarify their understanding of catch share programs. The questions asked led to threads of responses and follow-up questions. The question and comment threads are included below, organized both by topic and in the sequence they occurred.

Management Costs

Question: Costs of management and monitoring are very high in the groundfish fishery. As you move to new management, how do you deal with changing management costs? Target high value aspects not just quantity?

Tim Ward: We allow fishermen to decide: high research, low risk or vice versa. Transparency is an important element to consider and maintain. All costs of management are itemized and weekly cost recovery discussions are held with industry. Usually cost recovery is about five percent of the value of the catch; industry will not approve any recovery above that level.

Jim Seger: Agrees that costs look high; however, total costs versus incremental costs need to be deciphered. Still, costs are lower than the expected benefits from a change to a catch share program. Groundfish rationalization costs are below the net benefits from the whiting fishery alone.

“Subsidies are like adding insult to injury.”

–Rognvaldur Hannesson

Subsidies

Question: ITQs would extract rent. The U.S. West Coast already has landing fees to extract rent. The World Trade Organization (WTO) is trying to cutoff subsidies for fisheries, and we are in competition with agriculture and aquaculture which are highly subsidized with minimal rents compared to fisheries. How do we compete?

Rashid Sumaila: Subsidies may be applied across the board. If not, fisheries would be at a disadvantage.

Tim Ward: New industries like aquaculture are generally subsidized until they operate in the black, then cover own costs.

Rognvaldur Hannesson: Norway and Chile do not have subsidies for aquaculture. It would be good to see the agriculture subsidies go as well but need to avoid starting a subsidies arms-race. “Subsidies are like adding insult to injury.”

Follow-up Question: If we are going to talk about subsidies, we need to talk about disproportionate application of tariffs and the potential to levy import duties for funds to retrain participants.

Follow-up Question: Hard for WTO to establish what a subsidy is and what its properties should be. Subsidies raise concerns about generating more effort and allowing for latent effort in fisheries, but if agriculture and aquaculture, etc. do have subsidies – how can we compete with costs in competition?

Tim Ward: Australia has an appropriate approach. Research and development is funded with a three to one match with industry.

Business and Marketing Plan

Q: Before you implemented an ITQ, did you figure out a marketing plan?

Tim Ward: No, we did not do a marketing analysis. Implementation was incremental. First, we set-up the harvest strategy and people wanted the most fish. Then, there was a push for value adding and more fish was not as necessary. After that, we addressed market efficiency and people did not want to pay heavy research costs. However, when we later assessed risk, people wanted low risk which meant doing more research. Things evolve as the business changes and participants change.

Rashid Sumaila: Always base the first steps on avoiding overfishing then, consider the economy.

Julio Peña-Torres : Decisions made are based on the actors involved in the process.

Rognvaldur Hannesson: Vertical integration is not a bad thing. The ITQ system promoted vertical integration. In Norway, there is a law preventing too much accumulation of corporate vertical integration shares, the laws encourage owner-operated fisheries and the quota system has not had an effect on these laws, but rather vertical integration is intrinsically very hard to ban. There is fierce competition with other food products in Iceland. Therefore, the vertical integration system is a good economic model for them.

Follow-up Question: The focus is on cost savings rather than where the fish will go. You can gain efficiencies with ITQs beyond where you market?

Panel Majority: Yes

Tim Ward: ITQ allowed value added. Tuna farmers would have captured a big chunk of the fishery without the ITQ.

“Basically, catch shares will change business structures and bring economies of scale. The question is, is this something worth doing.”

–Tim Ward

Economies of Scale

Q: What are lessons learned from protections of small versus large vessels and companies, protection for small scale participants versus the vertically integrated, deep pocket interests?

Julio Peña-Torres : Two-tier system in Chile can be quite normal when you make big changes as not everyone will be facing the same costs. Different speeds of change can mean that cost increase more quickly for some than others. There can be great value in using different pathways of change.

Follow-up Question: Our fishery is more artisanal in scale versus some of your larger industrial examples. When adding observers, VMS, and other enforcement costs, we face burdens.

We need economies of scale to make it work from a cost standpoint. We need to reinvent business. Compared to other fisheries, how can we absorb costs without the burden being too much?

Rognvaldur Hannesson: Norway does not have any observers so it does not have high costs. Landings are recorded through shore-site sampling. Some high grading happens, but the fishery is fairly free of bycatch.

Rashid Sumaila: Deciding on who and how to pay cost recovery is a great debate. The value of how to capture rents is a judgment call; industries as well as the greater society have a stake in the future of the ecosystem.

Tim Ward: Cost recovery in Australia began when the government bank collapsed. Fishery users were primary beneficiaries so it was decided they should pay rent. It was thought that if they could not afford costs then, maybe the economic industry model was not an appropriate one. We set up a consulting process and gave fishers a greater say in the management of the fishery. “Basically, catch shares will change business structures and bring economies of scale. The question is, is this something worth doing.”

CPS Interests Panel



II. SHARING PERSPECTIVES

The second part of the workshop consisted of panel, large and small group discussion sessions in which participants shared their perspectives on CPS fisheries and the relevance and utility of catch share management. First, a CPS Interests Panel provided their perspectives on the fisheries and their thoughts and concerns about catch share management. Following that, a full audience discussion expanded the range and depth of the issues brought up during the CPS Interests Panel. The second day of the workshop closed with input and advice from the Case Study presenters. The third day started with small group discussions focused on reorganizing, reconsidering, and refining the input from the previous day. Before the close of the workshop, the audience heard the findings of each small group discussion session and was given an opportunity to offer final comments, conclusions, and reflections.

A. CPS INTEREST PANEL

A panel representing different CPS interests was convened in front of the audience to offer their perspectives on catch shares and generate some topics for broader audience consideration and discussion for the remainder of the workshop. The panelists were asked to focus the discussion on reflections from the case studies and the relevance of catch share management to CPS fisheries. The panelists included fishing and processing interests from the three sardine commercial fishery sectors (i.e., the Pacific Northwest, northern and southern California), and small landings fishing interests,⁵ the live bait fishery, and environmental interests (see Appendix B: Workshop participants). Some of their comments addressed specific advantages or disadvantages of catch share programs while others were more general considerations for the CPS fishery.

⁵ In the CPS FMP there is a limited entry exemption to accommodate small landings (<=5.0 mt) of CPS finfish that occur mainly during fishing for other species and for specialized markets.

CPS INTEREST PANEL

The results of the CSP Interest Panel session are presented here.

Aspects of Case Studies Relevant to CPS Fisheries

- Aspects of interest
 - o Programs address many adverse fishery conditions
 - o Quota can be defined by communities
 - o Increased independence
 - o High quality production
 - o Higher value for products
 - o Enhanced timing or continuity of products
 - o More and better research
 - o More opportunities for co-management
- Aspects of concern
 - o Short-term leasing of quota shares
 - o Fleet and or processor reductions
 - o Employment impacts
- Additional thoughts on catch share programs
 - o Large variation in program types
 - o Important to understand fishery interactions
 - o Must account for ecological interactions
 - o Question of how to handle incidental catches
 - o Question whether catch shares are an improvement for the fishery

CPS Fishery Management Considerations

- Lack of problem definition with current management
 - o Conservative management
 - o Overfishing not occurring, stock not overfished
 - o Concerns about government management trying to fix something that is not broken
- Tendency to overlook socio-economic considerations
 - o Inadequate accounting of community impacts
 - o Need to reconcile WA-OR-CA subsystems
- Lack of integrity in management
 - o Reactive instead of adaptive
 - o Politicization of management process
- Transboundary management coordination needed
- Insufficient small user set-asides
- Derby dynamics in fishery

Clockwise – Pacific Sardines in kelp forest, CPS fishing vessels at Terminal Island, Scoop of live bait, Full group discussion session, Bait barge



B. FULL GROUP DISCUSSION SESSION

A full group discussion session engaging all workshop participants followed the CPS Interests Panel. Participants were encouraged to introduce a thought or raise a concern for consideration by the full group even if it did not relate directly to a topic previously raised. Additionally, comment cards were distributed so participants could express their thoughts anonymously if desired.

Throughout this session, participants continued to consider many of the broader issues related to the CPS fishery. The session started with some participants generally questioning the need to come together to talk about catch shares for CPS fisheries. Other participants expressed their perspectives on specific issues in the fishery they felt should be addressed by any management system in place for CPS. A variety of recommendations on ways to address these issues were also offered. Many participants continued to comment on the advantages and disadvantages of catch shares relevant to the management of CPS fisheries. Towards the end of the session, some compelling insights and additional perspectives were submitted by the audience on comment cards. Several of the comment cards were read to the audience and generated interesting responses.

FULL GROUP DISCUSSION SESSION

The results from the Full Group Discussion session are presented as here.

Why talk about Catch Shares?

- Unclear problem definition
 - o Stock is not overfished
 - o Overfishing is not occurring
 - o Simpler issues to tackle; wasteful to invest in new management structure
 - o Management change creates winners and losers; must provide an analysis of change
 - o Question of how catch shares can work given imprecise science
 - o Question of whether the derby fishery is only a short-term problem and whether it is necessary to address

- Problems proposed
 - o Regional differences in fishing community; consider ways to manage besides catch shares
 - o Need management that works whatever the biomass status
 - o Too much harvest capacity, transboundary loop hole
 - o Concern about exacerbating the race; consider control dates

Can the fishery be improved?

- Increase market stability
 - o Investment planning for severe changes in biomass
 - o Improve continuity of product
 - Slow and lengthen push of resource to production
 - Generate value in consistency
 - Reconcile price with supply under the influence of a global market

- Improve scientific understanding for the management of the resource
 - o Understand resource dynamics with management
 - o Create transboundary agreements on harvest limits
 - o Allow for more flexibility
 - Time for fishery monitoring and harvesting
 - Re-consider fishing season start dates
 - o Reconcile derby pressure with availability of resource within different areas
 - Reduce north versus south competition
 - Set capacity goals

What are the concerns?

- Implementation issues
 - o Takes a long time in Council
 - o Spending on buybacks may be unnecessary
 - o Concern about capacity to assess community impacts and needs in management options

- Initial Allocation
 - o Under low biomass could generate unnecessary spending on buy back program
 - o Adequate consideration of small landings interests and niche markets

- Share values
 - o Deter new entrants to fishery
 - o Generate monopolies or oligopolies that will slow progress
 - o May be disproportionately impacted by placement of marine reserves
 - o Increase incentive to high grade
 - o Impacted by natural stock fluctuations across regions
 - o Resource or stock has inherently short-term availability

FULL GROUP DISCUSSION SESSION COMMENT CARDS

Re: some of the talks

Beginning of process would have to be much different just because of the culture.

Little guys and part-timers still have value.

Card One

Audience Member Response: Small guys are looking for new, higher-value products. Providing little guys with quota share would keep this niche market dynamic alive.

Marine reserves

Loss of grounds

Card Two

First Audience Member Response: If there is a quota share and marine reserves that cut into productive areas are established, then your share is no longer worth as much.

Second Audience Member Comment: Spatial restrictions on quota increase the costs and make it harder to fish.

Before catch shares are seriously considered for sardines and other CPS, an evaluation is needed of how it would affect the different players: single boat fishermen, processors with and without vessels, size of processors and vessels and single or multiple state players. Winners and losers should be evaluated. Catch shares affect the players as the resource expands and contracts.

Reactions ??

Card Three

Audience Member Response: We should evaluate the effect of catch shares to create winners and losers. For example, do processors end up with the entire quota and control the harvesters?

Economic analysis of catch shares stops with fishermen (vessel owners) and processors. Analysis of community impacts will be critical. CPS is a keystone to southern and central California fishing communities. CPS keeps skilled people employed when other species are not available much like groundfish does for the northerly ports, between crab and salmon. Community shares may solve some problems. How do we better define and understand community impacts?

Card Four

First Case Study Panelist Response: A trade-off evaluation is needed to determine benefits. A socioeconomic model should be built on top of a stock assessment model. With knowledge the spatial and age distributions, you could identify the best practice for catching fish with respect to location, timing and technique. Trade in catch shares could facilitate opportunities to catch fish in the most advantageous times and locations.

Second Case Study Panelist Response: People keep mentioning community impact analysis. In designing a program, ask what can be done to address community needs.

1. Will catch shares be applied to all CPS or just sardine ?
2. If ITQs are approved, how will allocations be made by Historical catch or Catch history period?
3. Any differentiation between Fed LE permits ^(constrained by capacity) vs. "Open Access" permits (LE by states with no capacity limits)
4. What about shares to...
Processors or Processors who own vessels
5. How would shares be redistributed if sardines are longer available in an area (i.e. retreat from PNW)
6. So much \$\$ toward catch shares that could/should be dedicated to research! (National railroad job!)

Card Five

No responses were voiced.

The panel made a good argument for some form of catch shares by noting:

- the need to get away from the derby fishery
- the need to ensure equity between regions
- the need to decrease capacity
- the need to protect the ability of individual fishermen to maintain their fishing lifestyle
- a design for community fishing associations
- the need to protect niche sub-sectors

If catch shares are not the answer, what is?

Card Six

No responses were voiced.

Better science equals higher quota...
means problem solved.

Card Seven

Case Study Panelist Response: Card assumes biomass will always stay high. You need a management system that reacts to both large and small biomass.

First Audience Member Comment: When supply goes up, price comes down.

Second Audience Member Counterpoint: Consistency is needed for the demand of the product.

Third Audience Member Response: The fact that industry was able to pay for a survey that was used in the stock assessment is rare in the U.S. This should not be rare. There is a tendency of variance around stock estimates and catch share programs seem to reduce that variance.

Fourth Audience Member Comment: Crisis is often when leadership takes place. The market ran freely for 10 years without reaching the quota. This fishery is moving in the right direction. In 2008-2009, the quota was low – is this not a crisis? Industry has been able to work with management more efficiently which is better.

C. CASE STUDY PANEL TWO: PRESENTERS TO AUDIENCE

Following the full group discussion session, the case study presenters regrouped to address the audience and by this time, had generated insights about the application of catch shares for CPS fisheries. They started by stating appreciation for the thoughtful manner in which the participants were sharing their thoughts and concerns. The case study panelists addressed some specific issues, made more general comments about managing fisheries, discussed what catch shares can and cannot be expected to achieve and recommended factors to consider when making management changes.

CASE STUDY PANEL TWO

The results presented for case study panel two reflect both the context and frequency of the topics raised and advice given.

Fishery Context and Culture when Considering Management Changes

- Derby fishery dynamics
 - o A competitive quota will lead the fishery to a derby over time
 - o Need to solve the allocation issue
 - o Need to institute a mechanism for reducing capital (i.e., Fishery must be overcapitalized to have a derby)
- Consensus on the nature of the problems is important for solving them
 - o Consensus to address issues is important to the negotiation process for exploring solutions
 - o In Chile, consensus was not achieved until the fishery got to a severe point in which there would not be a fishery if there was not consensus
 - o People interested in the U.S. West Coast CPS fisheries may need more time to come to consensus
- Keep working to address difficult issues and conflicts that arise in the fishery whether for catch share management or some other form of management
 - o Planning is better than not
 - o Decisions to address difficult management issues are often forced by crisis
 - o Less time to plan when there is crisis
 - o Be careful about the pressure to get everything just right all at once; leads to “complexity creep”
- Think about who and how people will have the “privilege” to make decisions
 - o Do not solely focus on who gets what in a political system
 - o Consider whether or not those decisions can be made external to the political system
- Recognize important issues in need of reconciliation by management, but learn to understand and recognize issues that are not specific to catch shares
 - o Some issues will be a part of any management system (i.e., the need for transboundary management agreements)
 - o Consider that there can be many levels of transboundary management (e.g., between states and between countries)
 - o A need for spatial management exists

Market Considerations

- Sardine prices must be understood at an international level
 - Global market indicates higher average price for sardine in other countries
 - Need to look at what drives the market to have better utilization of resources (e.g., timing, quality, etc.) then, fine tune the allocation system to increase revenue
 - Does not matter if the system is called catch shares, community-based allocation, ITQs, or something else altogether
- Must always deal with property rights over fish
 - Fish are a scarce resource and regulations must be in place to protect them
 - Catch shares give definition to rights and provide incentives and mechanisms for the market to appropriately price fish
- Free market dynamics do not have to dictate what happens with quota shares
 - New Zealand made shares tradable on the open market by defining them as property rights (e.g., leasing is a free market extreme)
 - Different program designs can yield different outcomes
 - Consider ITQs as the ultimate expression of the free market, then work from this option to structure a program to achieve goals
 - Think about ways to design a program to avoid extreme market concentration.
 - Discuss whether flexibilities for quota owners and constraints on market power can achieve desired goals

Uncertainty and the Relationship Between the Fishery Quota and Catch Share Planning

- Setting an overall quota is the management action to address overfishing
 - Catch share programs are not designed to solely address overfishing (i.e., in relation to comments made about there being little need to consider catch shares when CPS fisheries are not experiencing overfishing)
 - A management system is not one you can rely on if it only works when the quota is so high you are unable to catch it
 - Flawed input into the stock assessment may be a bigger problem than the assessment methodology
- The need to deal with uncertainty is endemic to fisheries
 - Better for fishery constituents to agree on how to address problems of uncertainty than for government to prescribe a blanket policy remedy
 - Co-management may be a better way to deal with risk and uncertainty and the process of assessing and deciding what to do incrementally (i.e., in relation to making adjustments to the TAC)
 - Co-management can be very helpful with catch share programs and ease the allocation process
 - Decisions about fishery participation and allocation of the TAC are decentralized from managers to industry participants
 - Allocation can be externalized from the political system making it easier to focus on other management issues

Prescriptions Suggested for the Fishery

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • Problems heard about fishery <ul style="list-style-type: none"> ◦ Derby exists ◦ Coast-wide allocation of quota ◦ Need for better stock estimates ◦ Need to work with Mexico and Canada ◦ Overcapitalization | <ul style="list-style-type: none"> • Prescribed Solutions <ul style="list-style-type: none"> ◦ Short-run: <ul style="list-style-type: none"> - Take steps to institute a finer spatial management - Consider changes to the temporal management ◦ Long-run: <ul style="list-style-type: none"> - Better management system <ul style="list-style-type: none"> • Improve data collection methods • Improve precision in stock assessments | <p>(continued)</p> <ul style="list-style-type: none"> - Institute a catch share program <ul style="list-style-type: none"> • Address overcapitalization • Remove the derby - Recommendations for Allocation Process <ul style="list-style-type: none"> • Establish an expert independent panel • Use input from all participants • Strive for the “fairest” model • Create an appeals process |
|--|---|---|

Counterclockwise, from upper left – Floatline, Squid lights, Stern of fishing vessel, Seines
Live bait well, Live bait sign



D. SMALL GROUP DISCUSSION SESSIONS

As the workshop progressed, concerns about allocation became more apparent. With this in mind, the workshop participants were organized into small groups to innovatively consider what an appropriate allocation might look like in terms of sharing the sardine HG among the fishery sectors, rather than being constrained to specific examples. Consequently, three small groups were formed. To initiate discussion, each small group was presented with an array of allocation structures, including several types of catch shares. The allocation structures included: current management, sector allocation, regional fishing associations, fishing communities, ITQs, and a category identified as “other.” The small group discussions focused on the advantages and disadvantages as well as the appropriateness of each allocation structure for management of CPS. Additionally, the groups raised suggestions for other allocation options to consider. Facilitators and recorders were assigned to each group and given discretion to sort information according to the flow of discussion within the group.

1. Group One

Group one first tallied “Issues for Evaluation” by eliciting allocation issues that participants felt were important to consider. The group worked through the advantages and disadvantages of the different allocation structures in relation to the issues identified. Participants discussed potential solutions catch shares might provide for allocation issues compared to current management. An important part of this discussion was consideration of the possibility for different groups of individuals to be affected differently under the alternative options. Through the process of exploring non-catch share and catch share management options, participants more thoroughly discussed catch share arrangements that would not require ITQs, but could potentially be used to address allocation challenges.

Group One

The results of group one's deliberations are presented here.

Plus (+) and minus (-) symbols denote whether a comment listed under the allocation schemes were considered to be an advantage or disadvantage by the group. The numbers following the identified advantages and disadvantages of the different allocation schemes reflect their discussion relative to "Issues for Evaluation". Bullet (•) symbols reflect statements that cannot be characterized as an advantage or disadvantage on a particular allocation structure.

ITQ's

- (-) Fishermen don't get enough share (3)
- (-) Windfall profits (3)
- (-) No catch history for recently purchased vessels (3)
- (-) Initial allocation problematic (3)
- (-) Consolidation (7)
- (-) Can lose community benefits
- (+) Benefit to some (7, 9)
- (+) Simpler (7)

Current Management

- (-) Unaddressed transboundary issues (10)
- (-) Inflexible harvest strategy (1)
- (-) Does not deal well with cyclicity and uncertainty (1, 2)
- (-) Coordination problems due to federal and state difference in permits rules (8)
- (-) Small operation more vulnerable (6, 7)
- (-) Overcapitalization of industry with inequity in capacity across states
- (-) No way to insure artisanal sector an allocation
- (-) Does not result in a community or fishery that is sustainable
- (+) Works in many situations for many individuals
- (+) Open to visually count fish
- (+) Aimed at sustainable fisheries, communities and resource stocks

Sector Allocation

- (-) Initial allocation is problematic (3)
- (+) Coordination easier with fleet homogeneity (3)
- (+) May protect small operators (7)
- (+) Could decide how to sub-allocate within sector (3)
- (+) Community benefits sustainable

Other Ideas

- State Department should address transboundary issue with a trilateral catch sharing agreement; NGOs can help pressure issue (1)
- Design better harvest strategy to consider resource cyclicity and assessment uncertainty; derive more precise biomass estimates (1)
- Time allocation (5)
- Consolidate fishery into an overarching system of rules for everyone exploiting the stock (3)
- Preserve the joy of fishing hard

Regional Fishing Associations

- (-) Address initial allocation (3)
- (-) Lead to fish not caught in region
- (+) Decide how to allocate within region
- (+) Might be able to offer quota transfer from one region to another
- (+) Community benefits sustainable

Fishing Community Quota

- (-) Initial allocation is problematic (3)
- (+) Coordination within community easier; lower bargaining costs (6)
- (+) Secure community assets and benefits

Issues for Evaluation

- | | | |
|---|--|---|
| (1) Dealing with resource cyclicity | (5) Derby dynamics; year round fishery | (8) How to handle federal and state permits |
| (2) Dealing with uncertainty in stock assessments | (6) Concern for small sectors | (9) Differential potential to add value |
| (3) Initial allocation | (7) Differential effects on sectors | (10) Transboundary stock |
| (4) Fishermen are hurt under ITQs | | |

2. Group Two

The discussion started with the group considering the advantages and disadvantages to the current management allocation structure. Then, the participants utilized those responses as a tool for discussing changes to the allocation structure and identifying what could be advantages and disadvantages of other allocation options. Regional distribution of quota was addressed in detail. The option was identified as a means to address regional differences in social values and fishery operations. People compared the regional allocation structure to other options throughout the discussion. Sector management was identified as a mechanism to split allocation along gear types. This option was quickly dismissed as unfitting for the fishery, however, it was noted that sector management could apply to the fishery's niche markets. Individual quotas were generally discussed in a negative context with predicted outcomes often expressed as fears or bad experiences in the groundfish trawl rationalization process. An "other" idea for an allocation structure was put forward to address fears of posturing for quota and dissolution of the goodwill that has been shared across the fishery coastwide. Unique to the "other" idea were "equal share" allocation and "use it or lose it" transferability provisions.

Group Two

These results of group two's deliberations are presented here.

Plus (+) and minus (-) symbols denote whether a comment listed under the allocation schemes were considered to be an advantage or disadvantage by the group. Bullet (•) symbols reflect statements that cannot be characterized as an advantage or disadvantage on a particular allocation structure.

ITQs

- (-) Unknowns of share size
- (-) Predictions of results
- (-) Positioning in fishery
- (-) Control date
- (-) Participant history
- (-) Lost Community
- (+) Free market
- (+) Potential for preventing future allocation fights

Current Management

- (-) Race for fish reduces value
- (-) Unknown catch, stock and market status in Mexico
- (-) 3rd period buffer, squid incidental
- (-) Flexibility in fishing choices; timing
- (-) Permit differences
- (-) Harvest timing; opening dates
- (+) No cost to change
- (+) Coast-wide equality (i.e., does not lock up fish in allocation fights)

Other Ideas

- Equal allocation
 - o One permit equals one share
 - o One processor equals one share
 - o Lack of use equals loss of share to processor or fisherman (1st year only perhaps?)
 - o Limits on quota by pounds and shares
- Transferability
- Redistribution process
- Processors can not lease
- Protections built in for environmental protections

Regional Quota

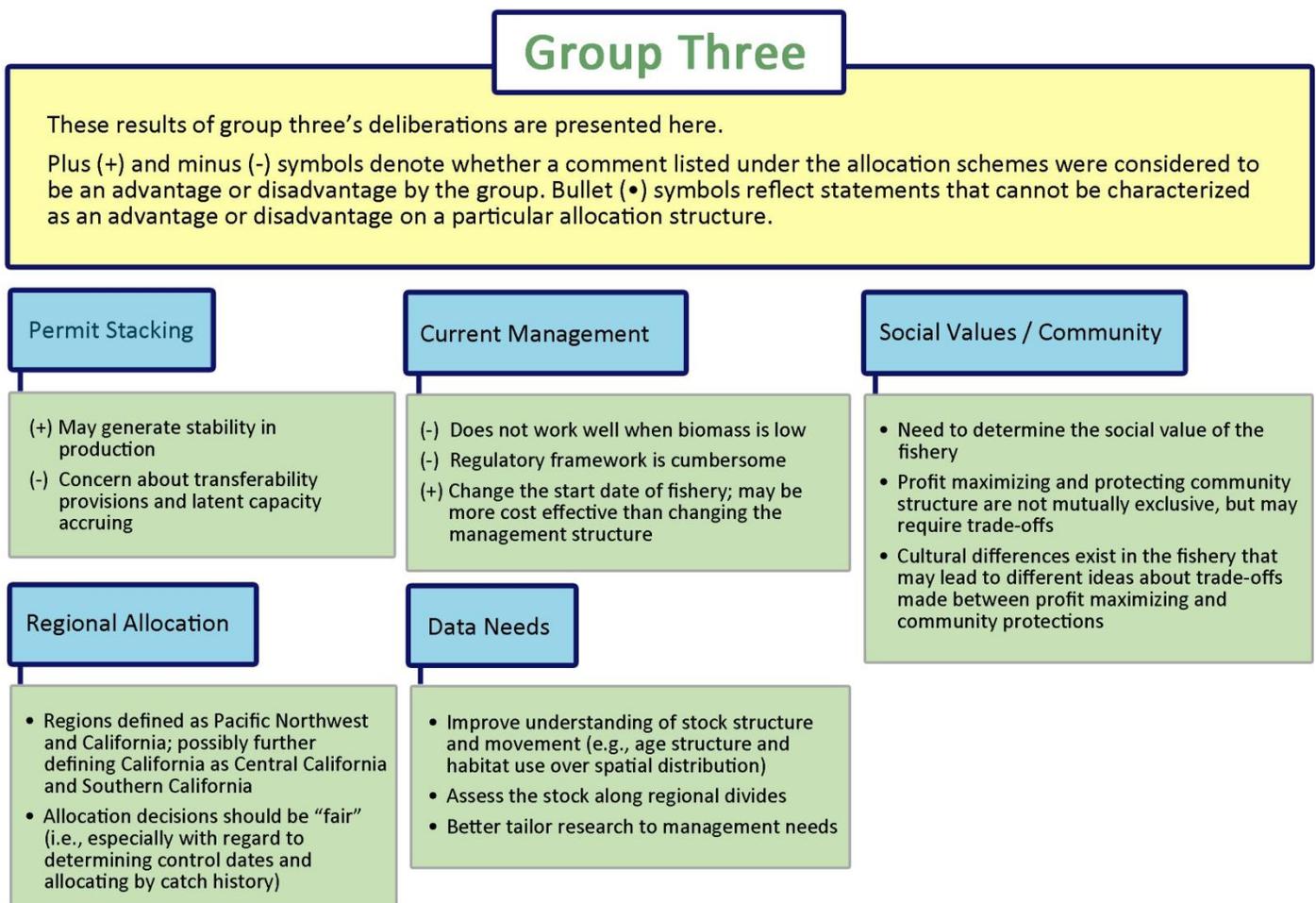
- (-) Lock up fish by region
 - o would need flexibility to transfer
 - o how to "mop up" unused allocation
- (-) Biology of fish across its environment
- (+) Harvest timing

Sector Allocation

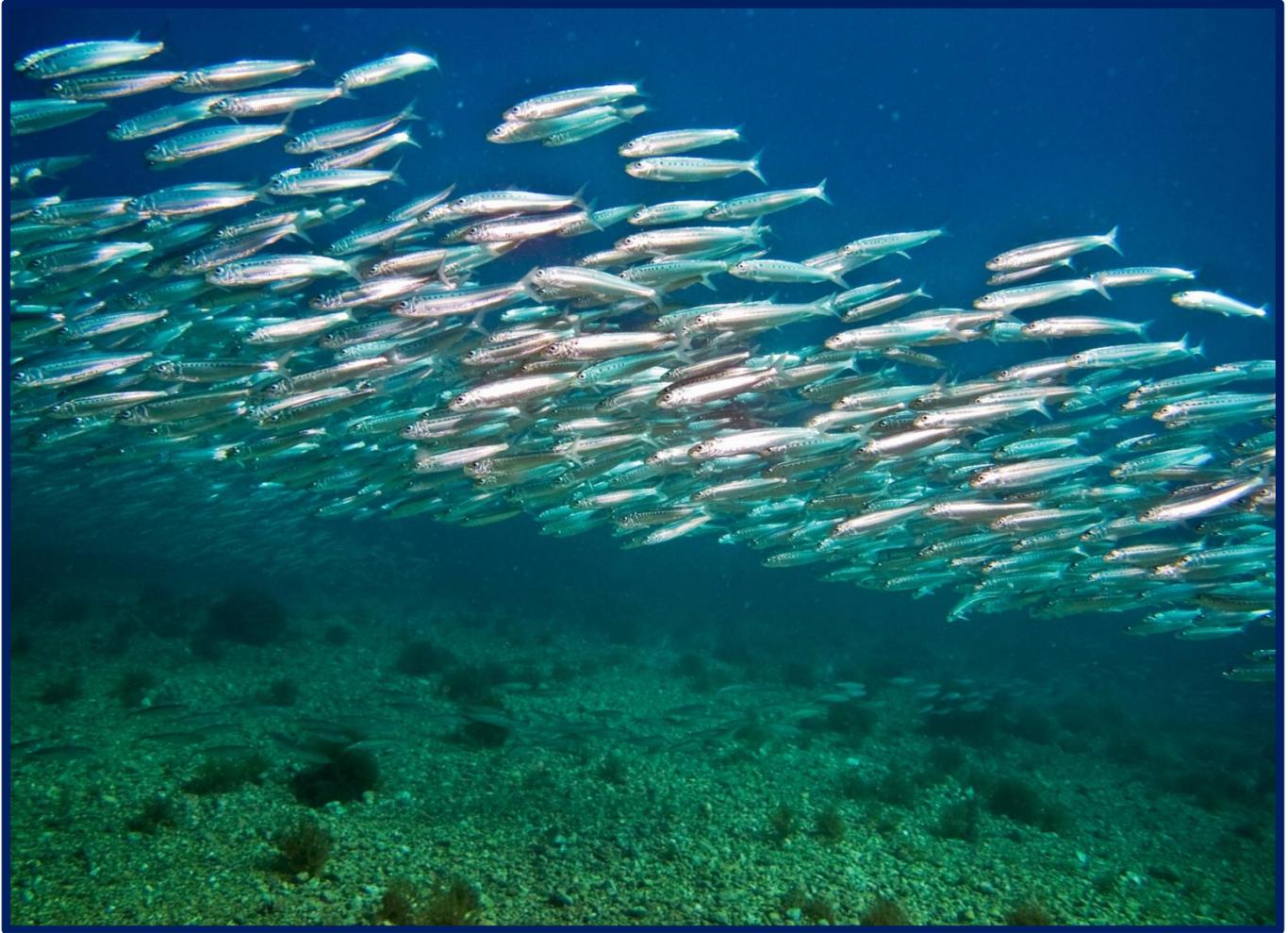
- (-) Limited Potential

3. Group Three

Rather than discussing the proposed allocation structures listed for discussion, this group began by talking about permit stacking as a means of addressing allocation issues. The group raised a number of concerns about community impacts of ITQs. Then, the discussion transited to current management problems and data needs. A need to reconcile regional discrepancies was a strong theme that spurred discussion of regional allocation schemes that could be premised on transferable share allocations. Sector management was considered only briefly as a possible means to regionally divide the fishery into sectors. Regional fishing associations and fishing community quotas were not addressed, but the group spent considerable time discussing differences in social values within the industry and the need for a management structure that can account for these differences.



Pacific sardine school



III. REFLECTING ON KEY WORKSHOP ISSUES

This section attempts to capture the views, concerns, questions, comments, and recommendations expressed by workshop participants (i.e., audience, stakeholder panelists, case study presenters, and the small groups) in short narratives organized by major topics and subtopics that are most related to either catch share management or to CPS fishery management in general.

A. ISSUES RELATED TO CATCH SHARE MANAGEMENT

This section includes the issues participants raised that were more specific to catch shares. Subtopics were organized according to the frequency with which those issues were raised at the workshop (i.e., more frequently discussed issues first).

1. Program Design and Implementation

Case study panelists advised that gaining consensus on the issues to address is important to the negotiation process of designing and implementing a catch share program. The panelists pointed out that different program designs yield different outcomes. They emphasized the desirability of shares to represent a well-defined right to a portion of the TAC and whatever their form, be tradable in open markets.

Participants frequently expressed concern for the amount of time and costs they expected for the design and implementation of a CPS catch share program. Reoccurring attention was paid to:

- Determination of initial allocations at either the vessel, sector, or regional level
- Adequate consideration of small landings interests and niche markets
- Opportunities for new entrants to the fishery (e.g., recently purchased vessels have no catch history)
- Consolidation and potential creation of monopolies or oligopolies
- Potential for the placement of marine reserves to have disproportionate impacts on CPS management
- Incentives to high grade
- Stock fluctuations across regions
- Inherently short-term availability of stocks
- Sector or regional allocation options (i.e., particularly with regard to niche markets)
- Sub-allocation within sectors or regions
- Transferability among sectors or regions
- Timing of fishing access
- Biological differences across species ranges
- Windfall profits under ITQs
- Equality in initial allocations
- Environmental protection

a. Scope of program

Participants noted a potential need for variation among the types of programs used to manage the different species of the fishery.

b. Buybacks

A few industry members expressed concern over the possible inclusion of buybacks in catch share programs. It was noted that under low biomass conditions, a buyback program could generate unnecessary government spending. Case study panelists suggested that buybacks will likely be unnecessary under catch share programs because some shareholders may willingly sell all their shares. This would result in fleet reduction and consolidation.

c. Duration of rights

A general sense among case study panelists was that the more durable the use right or privilege established by the catch share, the stronger the incentive on the part of the holder(s) to maintain a sustainable resource. For example, in the New Zealand rock lobster fishery, the perpetuity of the use rights established natural capital assets for the holders which enhanced stewardship and co-management.

d. Flexibility and transferability

Some members from industry acknowledged that catch share management may provide more flexibility for vessels, processors and other fishery entities in terms of planning and executing fishing operations.

Case study presenters recognized that it has often been desirable to constrain trade of quota shares during the early implementation stages of catch shares. However, as the programs matured, fishery participants often found it desirable to relax some of the transferability constraints.

1. Program Design and Implementation (continued)

e. Initial allocations

How initial allocation would be constructed appeared to be a paramount issue for participants considering catch shares for CPS finfish fisheries. Their concerns focused on eligibility to obtain permits, to hold shares as well as the process used for determining how many shares each permit would receive. The central issue with eligibility was whether or not both vessels and processors should receive quota shares.

The case study presenters addressed initial allocation as a major program design issue. The case study panelists deemed the process of deciding an equitable initial allocation mechanism as the most difficult part of program development, but they generally agreed that once allocation was accomplished the rest of the design and implementation process went relatively smoothly.

i. Uncertainty

Members of industry expressed concern about the uncertainty in the information needed to make initial allocation decisions, especially in terms of splitting the HG into shares. Participants expressed a need for routine data from Mexico and Canada on fishing activity and catches to reduce uncertainty in coastwide stock assessments.

ii. Equity

Some members of industry pointed to an assurance of equity in fishing opportunities between regions as an advantage of some catch share arrangements. Conversely, they felt a disadvantage of catch shares might be the deterrence of new entrants into the fisheries.

iii. Displaced capacity

Some consideration was given to the plight of entities that may not satisfy qualifying criteria for receiving shares. It was recognized that without transferability, some entities may not be able to acquire enough quota to work in the fisheries.

f. Spatial allocations

Many participants expressed interest in exploring regional allocations as a possible first step to introducing catch share management into CPS finfish fisheries. The regions could then decide how to best sub-allocate among entities within the region.

i. Welfare implications

Participants in small group three agreed that profit maximization and protecting community structure are not mutually exclusive goals, but recognized that goal-setting may entail trade-offs likely to be approached differently across the regions and communities of the fisheries. Under catch shares, higher value products from higher quality production and enhanced timing or continuity of landings could increase the net value of the fishery. For example, in the austral hake fishery, ITQs correlated with an increase in product diversification and increases in market prices. Participants in a survey in the austral hake fishery indicated that fishing effort was more cost-effective after the ITQ program was established. However, several participants in the CPS fisheries were concerned about communities from an equity standpoint. They expressed concern about some fishermen qualifying for catch shares and apprehension about winners and losers resulting from the initial allocation of quota shares.

ii. MPAs

Some members of industry expressed concern over the potential loss of fishing grounds and how some entities might be disproportionately impacted by the placement of marine reserves. A case study panelist warned that permits in a catch share system may be perceived to be of less value when MPAs superimpose spatial constraints on fishing activities.

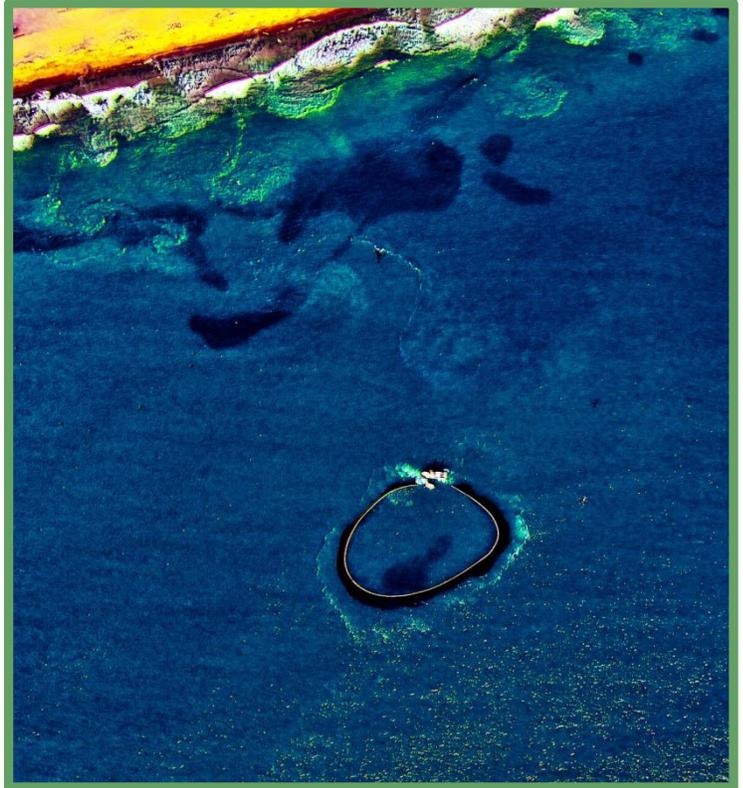
f. Stock Research

Participants regularly expressed consternation over large amounts of money being directed toward the development of catch share programs when they felt the funds could and should be dedicated to research.

Case study panelists asserted that users with exclusive rights have increased their participation in monitoring programs.

For example, in the New Zealand rock lobster fishery, where catch shares have been implemented, co-management and resource stewardship improved in large part because of industry's long-term investment in the resource under a more secure rights structure. Industry is more willing to support and participate in research efforts that promote better conservation and management when return on their investment is more secure (e.g., a right to harvest).

F/V Eileen, Capt. Nick Jurlin wraps a Pacific sardine school



2. Markets

Participants expressed the need to protect niche sub-sectors (e.g. small landings vessels, bait fisheries, niche products) that supply specialty markets because the “race for fish” threatens the viability of these sectors under the current harvest guideline allocation mechanism.

Case study panelists indicated that under catch share programs, there are likely to be more opportunities to develop or supply specialty markets because of the anticipated improvement in quality and consistency of landings. Further, these improvements may increase the value of CPS fishery production. In this regard, market driven aspects of sardine prices must be understood at an international level. However, global market dynamics do not have to dictate what happens with quota shares.

a. Consolidation

Participants expressed concern over the potential concentration of quota shares and the formation of monopolies or oligopolies. This could occur through the sale or lease of quota shares. In this regard, case study panelists suggested constraints be placed on how much quota share individual entities may acquire in existing programs. For example, excessive share limits were established in Alaska to ensure that no person may harvest more than 17.5 percent of the TAC. Excessive share provisions can also be used to prevent the concentration of shares in a particular port or geographic region.

2. Markets (continued)

b. Biological implications

Participants raised concerns about the spatial-temporal variability of CPS, their availability to the commercial fishery, and how their availability related to the value of quota shares. One case study panelist asserted that the definition of rights would provide mechanisms for the market to appropriately price fish. It was explained that one would generally expect, with all else equal, the value of quota shares would be highest for those who have the greatest opportunity to use them. Therefore, in the event that the sardine biomass disappears from one region for any length of time, the use value of catch shares in that region would be expected to approach zero. However, in the region(s) where sardine remained harvestable, quota shares would retain value, so there would likely be a transfer of shares from the former to the latter region(s).

c. Derby fishery

Many members of industry considered the derby fishery as only a short-term problem and questioned whether or not it was necessary to address. However, case study panelists regularly referred to the inflexibility and economic inefficiencies caused by derby fishery as the impetus for the catch share programs implemented in fisheries elsewhere. A few workshop participants suggested that fishery managers consider allocation options that prevent a derby fishery. Some discussion ensued over a need to establish control dates to avoid anticipatory positioning by fishing entities. Several participants suggested that management options other than catch share programs could solve exacerbated derby fishery conditions.

d. Globalization

Based on experience in fisheries where catch shares have been introduced, the programs could promote development of higher quality, more efficiently produced CPS products. This could result in less reliance on global CPS commodity markets and a higher value fishery.

Pacific sardine over edamame salad

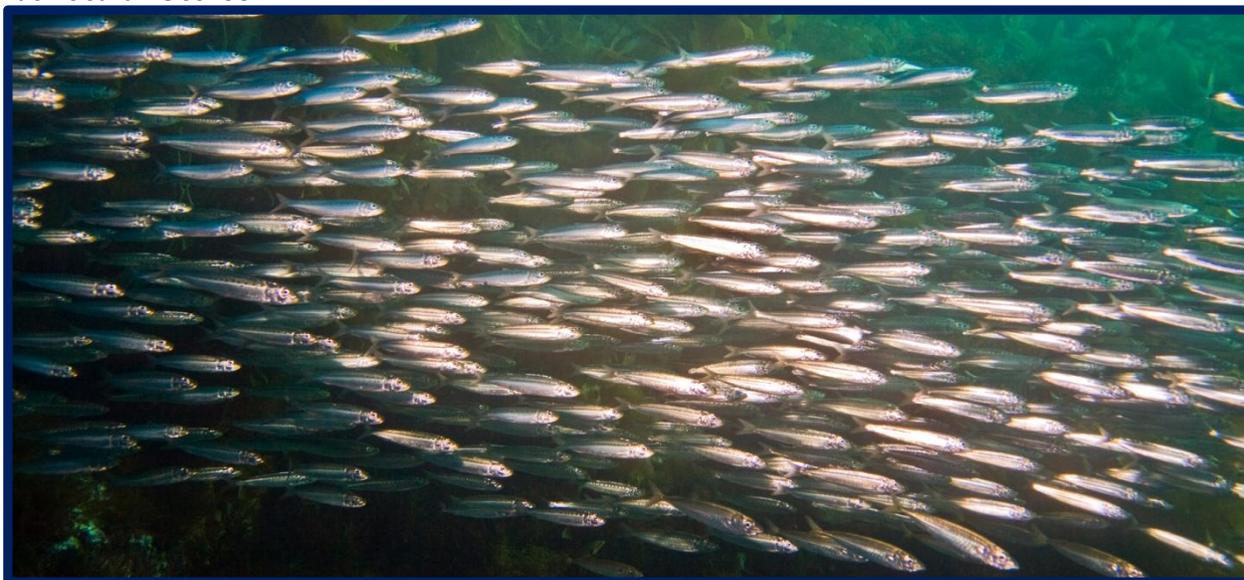


e. Risk

Workshop participants raised concerns about product continuity and fleet safety. Risk related considerations dealt with planning for the impact of climate change and the likelihood of a continued decline in the harvest guideline for sardine.

Case study panelists generally concluded that fishing operations are less likely to engage in risky situations under catch shares as there is reduced incentive to race for fish. In the South Australian sardine fishery, the certainty of ITQ management resulted in lower operational costs due to the increased ability of businesses to plan for the entire fishing season, the development of value-added products and market diversification.

Pacific sardine school



B. ISSUES RELATED TO CPS MANAGEMENT IN GENERAL

Throughout the workshop, participants discussed a variety of CPS issues for management to consider or reconcile. While many of their comments addressed these issues in regard to catch share management, it was acknowledged that many of the issues were not specific to catch shares and were applicable to CPS management in general. The issues to be considered by management under any type of allocation system are discussed in this section. Subtopics were ranked according to the frequency with which those issues were raised at the workshop (i.e., more frequently discussed issues first).

1. Current Conservation

Participants generally stated that by MSA National Standards, CPS stocks are conservatively managed. However, case study panelists affirmed, and many participants agreed, that management of allocations should be effective whatever the status of the stock.

a. Overfishing

Participants stressed the fact that the sardine stock is not experiencing overfishing and is not overfished. However, there was concern that catch shares, by increasing the incentive to high grade, could lead to overfishing and an overfished stock.

Many participants felt there was little need to consider catch shares when CPS fisheries are not experiencing overfishing. Case study panelists warned that catch shares do not fix overfishing and asserted that overfishing is prevented by setting appropriate harvest limits. They cautioned that a management system is not reliable if it only works when the TAC is not fully utilized.

b. Bycatch

It was noted that CPS fisheries experience little, if any, bycatch and only occasional waste; the latter is usually associated with a gear malfunction that results in unmarketable fish.

Left to right – Sampling on NOAA research vessel, Culled Pacific sardine for sampling, Numbered Pacific sardine samples, Data collection



2. Scientific Understanding of CPS Populations

Members of industry generally agreed that the scientific understanding of the population dynamics of CPS can be improved and that scientific research by NMFS is inadequate to predict stock size with an acceptable level of confidence. In this regard, many participants frequently conveyed needs for more extensive, scientifically-based population surveys that could produce better data to support the stock assessment process. Some argued that better science would result in higher quotas and obviate the need to make management changes; this argument being based on “high biomass” conditions prior to 2008 which resulted in the harvest guideline not being fully utilized.

A number of the case study panelists also emphasized that accurate and reliable stock assessments are the cornerstone of successful output controls, such as quota-based conservation and management, but that better biomass estimates alone may not eliminate the utility of catch shares or rights-based management. While better biomass estimates address the conservation side of the picture, they do not address issues associated with efficient utilization of the resulting HG upon which the fishery operates.

a. Ecosystem-based management

Participants felt it was important to understand and account for the ecological interactions of CPS.

b. Climate change and regime shifts

Many participants expressed concern over how quota shares would be redistributed if sardines were no longer available in an area (e.g., a contraction from the PNW). This concern is related to that of the observed cyclical nature of the Pacific sardine resource that is associated with decadal scale climate variability. A case study presenter advised that in the context of catch share management, transferability provisions should consider the possibility of shifts in resource distribution. Other participants urged the importance of taking environmental considerations, such as regime shifts, into account for setting harvest levels under any management regime.

c. Data needs

Members of industry in group three of the small group discussion session provided suggestions for improving stock research. These suggestions focused on understanding stock structure and movement (e.g., age structure and habitat use as it pertains to the stocks’ spatial distribution). Participants felt that addressing these data needs were critical to tailoring stock research to management needs.

Left to right – CPS fleet at Terminal Island, CPS fleet in Astoria



3. Current Management

Members of industry often questioned whether there was a problem with current management that warranted consideration of catch shares. In fact, the phrase “if it (management) isn’t broken, don’t fix it” was heard on several occasions. Some participants questioned the need for new management structures when much simpler solutions could be used to address management issues. During the CPS interests panel session however, some panelists opined that there was a lack of integrity in management; that management was reactive instead of adaptive; and that the current management process was too politicized.

The case study panelists advised that it was important to keep working to address difficult issues and conflicts that arise in the fishery whether for catch share management or management of some other form. One panelist suggested that while the current system may not be broken, it might be in need of a “tune up”. Another panelist warned that it is not constructive to simply focus on who gets what in a political system. Participants were encouraged to think beyond the inevitable political system to consider whom and how people will have the “privilege” to make decisions in management and whether or not those decisions can be made external to the political system.

The breakout groups expressed several concerns about current management, including:

- It does not address transboundary stock issues
- It uses an inflexible harvest strategy
- It does not deal well with cyclicality and uncertainty
- There are harmonization problems between federal and state permits due to different rules across states with current limited entry
- It is cumbersome
- It does not work well when biomass is low
- It does not result in fishing communities that are sustainable

Conversely, current management was perceived to work well by some members of industry because it achieved coastwide equity by not locking up fish in allocation fights. Some participants suggested that simply adjusting the season starting dates for the sardine fishery could lead to more flexibility for industry in terms of the timing of fishing operations and could be more cost-effective than changing the management system.

a. Limited entry permits

Members of industry frequently expressed concerns over the current limited entry program. These concerns related to the difference between federal FMP limited entry permits and the limited entry permits in Oregon and Washington. The federal limited entry program effecting California vessels has a harvesting capacity cap (PFMC 2002); state programs in Oregon and Washington do not have capacity caps.

b. Harvest capacity

Several participants asserted that there is overcapacity in the harvesting sector (i.e., more harvesting capacity than is necessary to harvest the annual quota). The fishery in the PNW is not under a capacity cap, as is the California fishery (i.e., under the CPS FMP). Many participants of the California fishery expressed their beliefs that the potential for the PNW to increase capacity gives the PNW an unfair competitive advantage in the current management system.

The case study panel pointed out that with catch shares, the need for capacity limitations tends to disappear because as derby conditions are eliminated, capacity becomes more evenly matched with the allowable catch (i.e., there is less incentive to build bigger, faster boats).

c. Transboundary management

Participants generally felt that Mexico and Canada set their own quotas as they saw fit because they did not trust our science. Many feel that the countries will not want to engage in cooperative transboundary conservation and management of the sardine resource for this reason. A suggested step to improve coordination would be the establishment of international quota shares. Overall there is too much harvest capacity trilaterally; participants suggested the creation of transboundary agreements on harvest limits.

d. Jones Act

Several participants frequently expressed concerns about the U.S. Jones Act exception which allows foreign vessels to participate in American fisheries when the vessels are less than five tons. Participants regularly related this concern to overcapitalization largely in the harvest sector and ironically, attributed this foreign source of excess capitalization to a result of the rationalization program in the Canadian herring fishery.

e. Other management options

Several members of industry often expressed their views that other management measures may be more acceptable than catch shares and that catch shares might not lead to an improvement in the fishery. Stacking of limited entry permits was one management option mentioned as an alternative that could achieve stability in production. However, there was concern expressed about drafting transferability provisions and the potential for latent capacity to accrue.

3. Community Impacts

Participants generally acknowledged that the CPS fisheries are a keystone to southern and central California fishing communities. The fisheries keep skilled people employed when other species are not available—much like groundfish does for more northerly ports that also fish crab and salmon. It was also recognized that different types of fishing groups (e.g. recreational anglers) are also part of these communities. In both cases, communities differ socially and culturally.

Members of industry and other management and conservation interests expressed interest in furthering their understanding of how community impacts are formally defined and analyzed as well as the capacity to assess community impacts and needs when considering management actions. CPS interests panelists expressed views that socio-economic considerations were often overlooked and that there was inadequate accounting of community impacts when making management decisions. Some participants noted a need to reconcile differences between the three fishery sectors when allocating quota by communities. The panel expressed particular concern about employment impacts related to expected fleet and processor reductions under a catch share program. After discussing community impacts of alternative allocation structures in the small group sessions, some participants developed unique design ideas for management systems. Participants proposed a need to determine the social values of the fishing communities. For example, is a community goal maximizing profits or is it maintaining the social structure? It was recognized that goals for profit maximizing and protecting community structure may require trade-offs and that cultural differences within the fishery may lead to different perspectives on the relative importance of profit maximization and community integrity.

CPS fleet in Monterey, California



a. Life style considerations

Participants discussed the changes that catch shares would likely induce to fishermen lifestyles and the culture of fishing communities which have adapted to the conservation and management systems currently in place. Some members of industry expressed their desire to maintain current fishing lifestyles and stated that any modification of the management system should minimize disruption. Some participants acknowledged these views and shared the perspective that the fishery lifestyle is exuded in the excitement of dealing with the vagaries of nature, which is embodied in the competition characterizing an open-access fishery, i.e., the “joy of fishing hard.”

b. Small scale operations/live bait

Beyond the comments expressed above with regard to markets, participants recognized the socioeconomic benefits generated by the “little guys and part-timers” (e.g., small landings vessels, bait fisheries and niche products). Most workshop participants felt that there was justification for small user set-asides.

Sunset in Santa Barbara Channel



IV. WRAPPING UP THE WORKSHOP

These proceedings provide a summary of the wide array of information that the participants of the CPS Catch Share Workshop accessed, discussed, and synthesized in San Francisco, California February 2-4, 2010. In their discussions, participants deliberated the advantages and disadvantages of rights-based management approaches in relation to the management of CPS fisheries. They highlighted many issues to consider for the potential use of catch share management in U.S. West Coast CPS fisheries. They also identified a variety of issues to consider for improvements to the conservation and management of the fisheries overall. These discussions elicited new ideas about how conservation and management could be more tailored to the specific circumstances of unique fishery sectors through both short-term fixes and long-term changes. Although there were numerous concerns expressed about the use of catch shares for management of the U.S. West Coast CPS fisheries, it was frequently heard that many elements of rights-based approaches appealed to participants as a potential means for individual fishery sectors to obtain and manage allocations based on their particular interests and needs.

In terms of moving forward, Mr. Helvey reminded the participants that the intent of the workshop was to provide relevant information to fishery constituents and decision-makers, and that no further action was planned by NMFS at this point. He reaffirmed the need for industry as well as other conservation and fishery interests to continue to talk with each other about addressing short-term fixes or making changes to management for the long-term.

Literature Cited

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Image:

- Jack mackerel and Pacific sardine
- The Golden Gate bridge
- Jack mackerel
- Float line
- Pacific sardine school
- Crow's nest
- Rigging
- Baja, Mexico fleet
- Float line and seine
- CPS Interests Panel
- Pacific sardine in kelp forest
- CPS fishing vessels at Terminal Island
- Scoop of live bait
- Full group discussion session
- Bait barge
- Floatline
- Squid lights
- Stern of fishing vessel
- Seines
- Live bait well
- Live bait sign
- Pacific sardine school
- F/V Eileen, Captain Nick Jurlin wrapping
a Pacific sardine school
- Pacific sardine over edamame salad, garnished
with a beet
- Pacific sardine school

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- California Wetfish
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Image:

- Sampling on NOAA research vessel
- Culled Pacific sardine for sampling
- Numbered Pacific sardine samples
- Data collection
- CPS fleet at Terminal Island
- CPS fleet in Astoria
- CPS fleet in Monterey, California
- Sunset in Santa Barbara Channel

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APPENDICES

Appendix A: Agenda

COASTAL PELAGIC SPECIES FISHERY CATCH SHARE WORKSHOP

FEBRUARY 2-4, 2010, SAN FRANCISCO, CA

The purpose of this workshop is to bring together individuals with a range of interests in coastal pelagic species (CPS) to learn more about different types of rights-based fisheries management programs, and to generate meaningful discussions and gauge current thinking as to whether rights-based fisheries management is potentially useful in U.S. U.S. West Coast CPS fisheries.

TUESDAY, FEBRUARY 2

On-site Registration Opens at 7am (*pick-up workshop materials*)

8:30am- Meet and Greet (*Continental breakfast provided*)

9:15am- Introduction to Workshop (*Mark Helvey*)

9:30am- NOAA Catch Share Policy (*NOAA Fisheries*)

10:15am- Exploring conditions in the U.S. West Coast coastal pelagic species fishery (*Sam Herrick*)

10:45am- Break

11:00- Catch shares and fisheries management (*Rognvaldur Hannesson*)

11:45am- Rights-based management: Program variety for fisheries (*Amber Morris*)

12:00pm- Lunch (*Buffet lunch provided*)

1:00pm- Case Study- U.S. West Coast groundfish trawl rationalization (*Jim Seger*)

1:40pm- Case Study- Rights-based fishery management in Chile: How it was done and how it has worked (*Julio Peña-Torres*)

2:20pm- Break

2:40pm- Case Study- Namibian fisheries management with emphasis on the use of individual catch quotas
(*Rashid Sumaila*)

3:20pm- Case Study- Assessment and management of the South Australian sardine fishery: A good example of the benefits of individual transferable quotas (*Tim Ward*)

4:00pm-Case Study Panel, Session 1

5:00pm- Wrap Up

COASTAL PELAGIC SPECIES FISHERY CATCH SHARE WORKSHOP

FEBRUARY 2-4, 2010, SAN FRANCISCO, CA

WEDNESDAY, FEBRUARY 3

8:30am- Introduction (*Continental breakfast provided at 8am*)

8:50am- Case Study- Thinking through catch share programs: Questions about property rights and institutional design raised by the New Zealand rock lobster experience (*Tracy Yandle*)

9:30am- Case Study- Quota-based catch share programs in the Bering Sea pollock fishery (*Glenn Merrill*)

10:10am- Analysis of the price response in the U.S. Pacific sardine fishery (*Chin-Hwa "Jenny" Sun*)

10:40am- Break

11:00am- Case Study Panel, Session 2

11:30pm- Lunch (*Buffet lunch provided*)

1:00pm- CPS Fishery Interests Discussion Session

3:30pm- Break

4:00pm- Case Study Panel, Session 3

5:00pm- Wrap-up

THURSDAY, FEBRUARY 4

8:30am- Introduction (*Continental breakfast provided at 8am*)

9am- Small Group Discussion Session

10:30am- Break

10:45am- Report from Small Group Discussions

11:30am- Break

11:45am- Round Robin Wrap Up

12:30pm- Workshop Adjourn

Appendix B: Workshop Participants

	PARTICIPANTS	AFFILIATION
1	Jay Bornstein	Bornstein Seafood
2	Brizendine, William "Buzz"	Pacific Fisheries Management Council (PFMC)
3	‡ Cappuccio, Joe	Del Mar Seafoods
4	Carlson, Karen	NOAA, Office of Program Planning and Policy Integration, Sea Grant Fellows
5	Carroll, Richard	Ocean Gold Seafoods
6	Chambers, Susan	West Coast Seafood Processors
7	Crabbe, David	PFMC Council Member
8	‡ DeLuca, Vanessa	State Fish Company
9	‡ Everingham, Roy "Buck"	Everingham Bros. Bait Company
10	Feder, Judson	National Marine Fisheries Service (NMFS), Southwest Region, General Counsel
11	‡ Ferrigno, Ciro	F/V Ferrigno Boy
12	Franke, Ken	Sportsfishing Association of California
13	‡ Fujita, Rod	Environmental Defense Fund
14	‡ Gingerich, John	Hueneme Fish Company
15	Grader, Zeke	Pacific Coast Federation of Fishermen Association and Institute for Fisheries Resources
16	Griffin, Kerry	PFMC staff
17	‡ Guglielmo, Aniello	F/V Trionfo

** Denotes participation on Case Study Panels

‡ Denotes participation on CPS Interests Panel

☼ Denotes member of the Workshop Steering Committee

Appendix B: Workshop Participants

	PARTICIPANTS	AFFILIATION
18	Guglielmo, Pete	Southern California Seafood
19	Hansen, Don	Dana Wharf Sportfishing
20	** Hannesson, Rognvaldur	The Norwegian School of Economics and Business Administration
21	Haworth, David	PFMC CPS Advisory Subpanel
22	Heberer, Craig	NMFS, Southwest Region, Sustainable Fisheries Division
23	☀ Helvey, Mark	NMFS, Southwest Region, Sustainable Fisheries Division
24	☀ Herrick, Sam, Jr.	NMFS, Southwest Fisheries Science Center, Fisheries Resource Division
25	Joner, Steve	Makah Fisheries Management
26	Jurlin, Nick	F/V Eileen
27	‡ Kapp, Ryan	Gulf Vessel Management
28	Krutzikowsky, Gregory	Oregon Department of Fish and Wildlife, Nearshore & Coastal Pelagic Species Fisheries
29	Laughlin, Leeanne	California Department of Fish and Game, Coastal Pelagic/Highly Migratory Species
30	Law, Eugene	PFMC CPS Advisory Subpanel
31	☀ Lindsay, Joshua	NMFS, Southwest Region, Sustainable Fisheries Division
32	Lowman, Dorothy	PFMC Council Member

** Denotes participation on Case Study Panels

‡ Denotes participation on CPS Interests Panel

☀ Denotes member of the Workshop Steering Committee

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	PARTICIPANTS	AFFILIATION
33	Marchand, A. Pierre, Jr.	Ilwaco Fish
34	Mayer, Richard	Marcus Food Co., Fisheries Division
35	McInnis, Rodney	NMFS, Southwest Regional Office
36	** Merrill, Glenn	NMFS, Alaska Region
37	Mineo, Frank	F/V Mineo Bros.
38	☀ Morris, Amber	NMFS, Southwest Region, Sustainable Fisheries Division
39	Myer, Dale	PFMC Council Member
40	Niles, Corey	Washington Department of Fish and Wildlife
41	Okoniewski, Michael	Pacific Seafood, Alaska Operations, Sardines & Squid
42	Ostdahl, Maggie	Environmental Defense Fund
43	** Peña-Torres , Julio	Universty of Alberto Hurtado, Department of Economics and Administration
44	Pinkerton, Corinne	NMFS, Southwest Region, Sustainable Fisheries Division
45	Pleschner-Steele, Diane	California Wetfish Producers Association
46	☀ Pomeroy, Carrie	California Sea Grant
47	Seger, James	PFMC Staff
48	Stohs, Stephen	NMFS, Southwest Fisheries Science Center, Fisheries Resource Division

** Denotes participation on Case Study Panels

‡ Denotes participation on CPS Interests Panel

☀ Denotes member of the Workshop Steering Committee

Appendix B: Workshop Participants

	PARTICIPANTS	AFFILIATION
49	** Sumaila, Rashid	The University of British Columbia, Fisheries Centre & Fisheries Economics Research Unit
50	** Sun, Chin-Hwa Jenny	Institute of Applied Economic, National Taiwan Ocean University, Visiting Scientist at the Southwest Fisheries Science Center
51	‡ Thon, Jerry	Astoria Holdings Inc.
52	Torre, Vince	Tri-Marine Fish Co.
53	Tringali, Sal	Monterey Fish Co.
54	** Ward, Timothy	South Australian Research and Development Institute, Wild Fisheries; Flinders University, School of Earth and Biological Sciences
55	** Yandle, Tracy	Emory University, Department of Environmental Studies
56	Fairchild, Teresa	Pacific States Marine Fisheries Commission
57	Kincheloe, Thom	Pacific States Marine Fisheries Commission
58	Porter, Russell	Pacific States Marine Fisheries Commission

** Denotes participation on Case Study Panels

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Appendix C: Speaker Biographies

Mark Helvey is the Assistant Regional Administrator for Sustainable Fisheries with the Southwest Regional Office (SWRO) of NOAA's National Marine Fisheries Service. He received a M.S. degree in Marine Sciences from the University of Arizona, and a M.B.A. from California State University, Long Beach. In his current position, he is involved in domestic and international fishery issues as they relate to highly migratory and coastal pelagic species. Mr. Helvey represents the SWRO at the Pacific Fishery Management Council. His present interests revolve around seeking sustainable fishing opportunities for U.S. West Coast fishermen.

Monica Medina is the Commerce Department Principal Deputy Under Secretary for Oceans and Atmosphere. Medina served as the chairperson to the NOAA Catch Share Task Force and was recently appointed the U.S. commissioner for the International Whaling Commission by President Barack Obama. Prior to joining the Obama Administration, Medina served as a senior officer in the Pew Environment Group, where she provided advice and assistance on issues of marine law and policy. She also spent four years as a partner at Heller Ehrman White & McAuliffe, with a practice focused on environmental law, corporate law, and biotechnology matters. Before joining NOAA, Medina served as Deputy Associate Attorney General at the U.S. Department of Justice, with oversight of the environment division. Earlier, she was a senior counsel to the U.S. Senate Committee on Environment and Public Works.

Sam Herrick, Ph.D. is an Industry Economist with NOAA, National Marine Fisheries Service, Southwest Fisheries Science Center in La Jolla, California. His areas of interest include welfare economics, fisheries conservation and management policy analysis, the economics of climate change and small pelagic species fisheries and the ecosystem approach to fishery conservation and management. Currently he is pursuing these interests by conducting economic research on the conservation and management of small pelagic fisheries in the eastern Pacific Ocean.

Chin-Hwa (Jenny) Sun, Ph.D. is a professor in the Institute of Applied Economics and Department of Environmental Biology and Fisheries Science, National Taiwan Ocean University, and a visiting research scholar with the Inter-American Tropical Tuna Commission. She has published extensively on the economics of Taiwan's tuna and small pelagic species fisheries. Dr. Sun's interests in fisheries economics cover a number of topics, including bioeconomics, climate change, international trade, transboundary conservation and management and rights-based management. Her recent work deals with the asymmetric externalities of the tuna longline and purse-seine fisheries in the eastern Pacific Ocean, and with inverse demand systems in global tuna and small pelagic species fisheries.

Rognvaldur Hannesson, Ph.D. is a professor of fishery economics at the Norwegian School of Economics and Business Administration, Bergen Norway. He has published several books on fisheries economics and management and large number of papers in scientific journals. Apart from fisheries economics, his interests include the economics of petroleum and other natural resources. He has advised the Norwegian and Icelandic governments on fisheries policy and done consultancy work for the OECD the FAO and the World Bank. He is a member of the advisory committee on fisheries management for the Director General of the FAO.

Amber Morris is a fishery policy analyst for Sustainable Fisheries with the Southwest Regional Office (SWRO) of NOAA's National Marine Fisheries Service. She is deeply interested in the interface between fisheries science and policy. Ms. Morris received her M.S. in Marine Science and has completed all the coursework for Masters in Public Administration from the University of North Carolina at Wilmington. In her current position, Ms. Morris's primary area of research focuses on allocation mechanisms and their influence on fisheries management activities. Serving in the Fisheries Management Branch, Ms. Morris is involved in the Pacific Fishery Management Council process and regulatory matters focused on coastal pelagic and highly migratory species.

Jim Seger has been on staff with the Pacific Fishery Management Council for 22 years. During that time he has had a key role in the development of limited entry policies for the groundfish fishery. He began with the Council in 1987, working on the groundfish license limitation program, which was implemented in 1994. Beginning in 1991 he was the Council staff lead on rationalization of the limited entry fixed gear sablefish fishery, which culminated in the permit stacking program currently under which the fishery is currently managed. For the last seven years he worked on the trawl rationalization program, which was recently adopted by the Council and is currently going through the NMFS approval process. Mr. Seger has a Masters of Marine Affairs from the University of Washington and has completed additional graduate work in economics. Prior to coming to the Council, he spent time working as a foreign observer and as a biologist on research cruises in the north Pacific and Bering Sea

Rashid Sumaila, Ph.D. is director of the Fisheries Centre at the University of British Columbia, Vancouver, Canada. He also directs the Fisheries Economics Research Unit (FERU) at the Centre. Dr. Sumaila is deeply interested in how economics, through integration with ecology and other disciplines, can be used to help ensure that environmental resources are sustainably used and managed for the benefit of both current and future generations. Dr. Sumaila has authored numerous journal articles, edited books/volumes, book chapters and other publications. His work is taken seriously by policy makers at the highest levels, and has generated significant international interest. Sumaila has won the Aldo Leopold Fellowship, Pew Fellowship for Marine Conservation; Craigdarroch Award for Societal Contribution; the Zayed International Prize for the Environment, and the Peter Wall Centre Senior Early Career Scholar Award.

Julio Peña-Torres, Ph.D. is a professor in the department of Economics & Business, Universidad Alberto Hurtado, Santiago, Chile. He has published extensively on the economics of Chile's small pelagic species fisheries. Dr. Peña-Torres's interests in the fisheries economics cover numerous topics, including bioeconomics, climate change, transboundary conservation and management and rights-based management. His recent work deals with the non-linearity in catch per effort in small pelagic species fisheries.

Appendix C: Speaker Biographies

Tim Ward, Ph.D. has a long and diverse involvement in marine science, especially the fishing industry, and has worked as a commercial fisher, Australian fishing zone observer, scientific consultant to the film industry, university lecturer and fisheries manager, as well as a research scientist. In his current position as Leader of the South Australia Research and Development Institute's, Aquatic Sciences' Wild Fisheries Science Program Area, Professor Ward manages research on all of South Australia's fisheries. Professor Ward is recognized nationally and internationally for his research on pelagic fish, especially stock assessment of sardine using the daily egg production method. He is currently leading a large multi-disciplinary study to develop ecological performance indicators for the South Australian Sardine Fishery. Professor Ward is also affiliated with the University of Adelaide and Flinders University of South Australia.

Tracy Yandle, Ph.D. has research interests in the institutions used to govern natural resource use and environmental issues. Her primary research focuses on the social and institutional changes associated with the market-based regulatory approach and the co-management approach to resource management. She has a Ph.D. in Public Policy from Indiana University (where Elinor Ostrom was her dissertation supervisor) and an MES in Environmental Studies from Baylor University. For the past decade, her primary case has been New Zealand's fish management system, focusing on its path-breaking "individual tradable quota" (ITQ) programs which gave commercial fishers property rights to fish. Dr. Yandle's interest is in the evolving governance of the system, which has developed to give the industry participants an increasing role in fishery management. She has developed models of how the evolving governance system works including the engagement (and roles) of the different participants - from government through industry groups to the individual fisher. She argues that ITQs and similar property rights-based management systems cannot be seen as a static policy tool, but as a vital institutional change that profoundly influences the regulated and regulatory community far beyond the original natural resource management goals.

Glenn Merrill coordinates catch share programs for the NMFS Alaska Region. His primary roles include leading program development and implementation, and outreach to the North Pacific Fishery Management Council and affected industry participants. He has previously worked as a resource analyst for Native Alaskan communities in the Aleutian Islands, research associate for the National Research Council, Dean A. Knauss Sea Grant fellow, and a fisheries observer in Alaska and off the Pacific Coast. He holds a Master's of Marine Affairs from the University of Washington.

Carrie Pomeroy, Ph.D. is a Research Scientist with the University of California Santa Cruz Institute of Marine Sciences (1995-2005) and a Marine Advisor with the California Sea Grant Extension Program (SGEP; 2005-present). She conducts social science research, education and outreach, to document and improve understanding of the human systems associated with California's fisheries and fishing communities, and facilitate its application. In addition, she serves on local, state and regional advisory committees. Her work has included research on the socio-economic organization of California's squid and wetfish fisheries, the Moss Landing and Santa Cruz Harbor commercial fishing communities, the socio-economic impacts of marine reserves on fisheries, and the effects of regulatory change on ports and port infrastructure. She holds a MA in Marine Policy from the University of Miami and a PhD in the Human Dimensions of Fisheries from Texas A&M University.

Appendix D: Catch Share Glossary

MANAGEMENT STRATEGIES	DEFINITION <i>key characteristics</i>	SOURCE www.nmfs.noaa.gov/sfa See: Glossary of CS programs
Rights-based-management	A system, in which “individuals or groups entitled to access the fishery are said to have use rights; that is, the right to use the fishery resources; while others do not have the right to “use” the fishery. Rights in a fishery define what particular actions the fisherman is authorized to take and claim to a benefit stream (i.e., fish catch) that is consciously protected, in most cases by the government. For example, a right provides the authority for a fisherman to operate in a specific fishing ground or fishery. The more complete the set of rights, the less exposed the fishers are to the actions of others, the less risk that the fishermen face, and the more stable are expectations concerning catch and management. Rights are also felt to provide fishermen with an incentive for long-term sustainability and greater stewardship.”	- Not defined in the Magnuson-Stevens Act (MSA) - Dr. Robert Pomeroy, Sea Grant, Publication Number CTSG-04-02
Catch Shares	A catch share program is a generic term used to describe fishery management programs that allocate a specific percentage of the total allowable fishery catch or a specific fishing area to individuals, cooperatives, communities, or other entities. It includes more specific programs defined in statute such as Limited Access Privileges (LAP) and Individual Fishing Quotas (IFQ). It also includes Territorial Use Rights Fisheries (TURFs) that grant an exclusive privilege to fish in a geographically designated fishing ground. The recipient of a catch share is directly accountable to stop fishing when its specific share allocation is reached.	Not defined in the MSA
Limited access system	A system that limits participation in a fishery to those satisfying certain eligibility criteria or requirements contained in a fishery management plan or associated regulation.	MSA 16 USC 1802 (27)
Limited access privilege (LAP)	A Federal permit, issued as part of a limited access system under section 303A to harvest a quantity of fish expressed by a unit or units representing a portion of the total allowable catch of the fishery that may be received or held for exclusive use by a person. This includes individual fishing quotas, but does not include community development quotas as described in section 305(i).	MSA 16 USC 1801(26)
Dedicated access privilege (DAP)	A novel form of output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a specified percentage of the total allowable catch. Includes individual fishing quotas (IFQ), individual transferable quotas (ITQ), fishing community quotas, fishing cooperatives, and other geographically based programs that give an individual or group dedicated access to the fish within a specific area of the ocean.	- Not defined in the MSA - Defined in the U.S. Commission on Ocean Policy Report

Appendix D: Catch Share Glossary

MANAGEMENT STRATEGIES	DEFINITION <i>key characteristics</i>	SOURCE www.nmfs.noaa.gov/sfa See: Glossary of CS programs
Individual Fishing Quota (IFQ/ITQ)	<p>IFQ- A Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by a person. Such term does not include community development quotas as described in section 305(i).</p> <p>ITQ- An individual fishing quota (IFQ) program where privileges can be transferred subsequent to initial allocations.</p>	IFQ- MSA 16 USC 1802(23) ITQ- Not defined in MSA
Regional Fishing Association (RFA)	<p>An association formed for the mutual benefit of members to meet social and economic needs in a region or sub-region; comprised of persons engaging in the harvest or processing of fishery resources in that specific region or sub-region or who otherwise own or operate businesses substantially dependent upon a fishery.</p>	MSA 16 1802(14)
Sector Allocation	<p>An exclusive assignment of some portion of the TAC to a group of two or more individuals holding permits in a fishery that have fulfilled Council eligibility and participation criteria, and have agreed to collaborate, voluntarily and for a specified period of time, in order to achieve a common set of objectives. The group may be organized around a particular gear type, species or geographic area with its purpose being the receipt of an exclusive privilege to fish.</p>	Not defined in the MSA
Territorial Use Right Fishery (TURFs)	<p>A single fisherman (or firm, organized group, community, etc.) having an exclusive privilege to fish in a geographically designated fishing ground. [Note: Even though the term itself uses the word “right” the catch share programs in this policy are defined in terms of a granting of a privilege, not a property right.]</p>	Not defined in the MSA
Fishing Cooperative	<p>A group comprised of “persons engaged in the fishing industry as fishermen, catching, collecting, or cultivating aquatic products, or as planters of aquatic products on public or private beds, that may act together in association, corporate or otherwise.”</p>	<p>- Not defined in the MSA</p> <p>- Defined under the Fishermen’s Collective Marketing Act (FCMA) of 1934 (15 USC 521)</p>

**U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Region**
