

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.<sup>2</sup> 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***

<sup>2</sup> 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 rent<sup>3</sup>
  - 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.

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<sup>3</sup> “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)

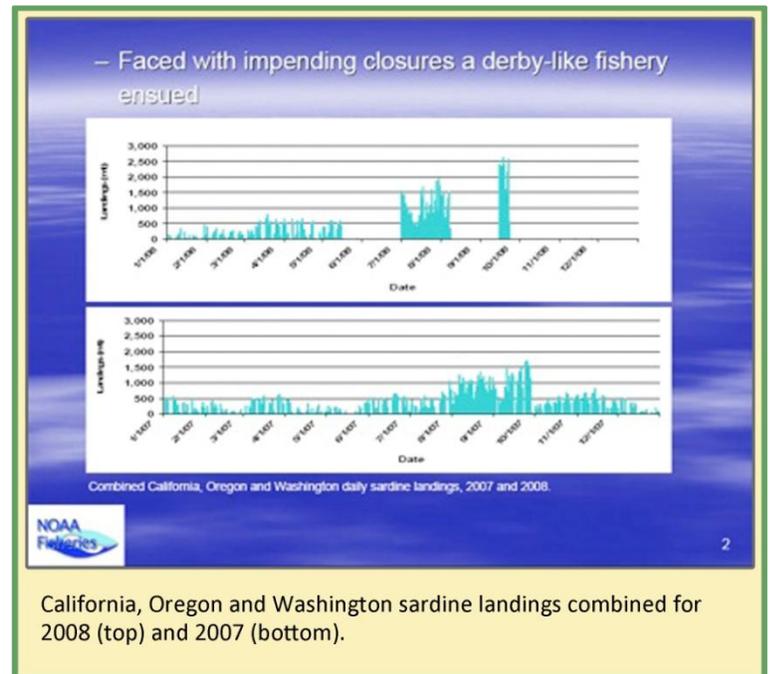
- Pacific sardine are targeted by three U.S. fishery sectors
  - Southern California (customarily San Pedro port area)
  - Northern California (customarily Monterey port area)
  - Pacific Northwest (Washington and Oregon; mostly Oregon landings)
- Peak fishing occurs at different times of the year for 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.

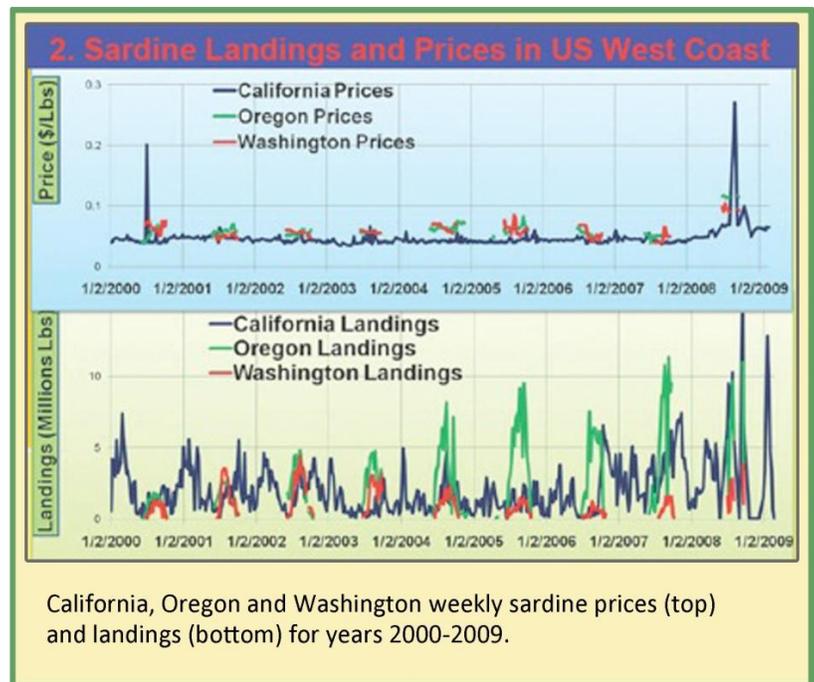
## 4. Price Response Analysis of the U.S. Pacific Sardine Fishery

*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.”***

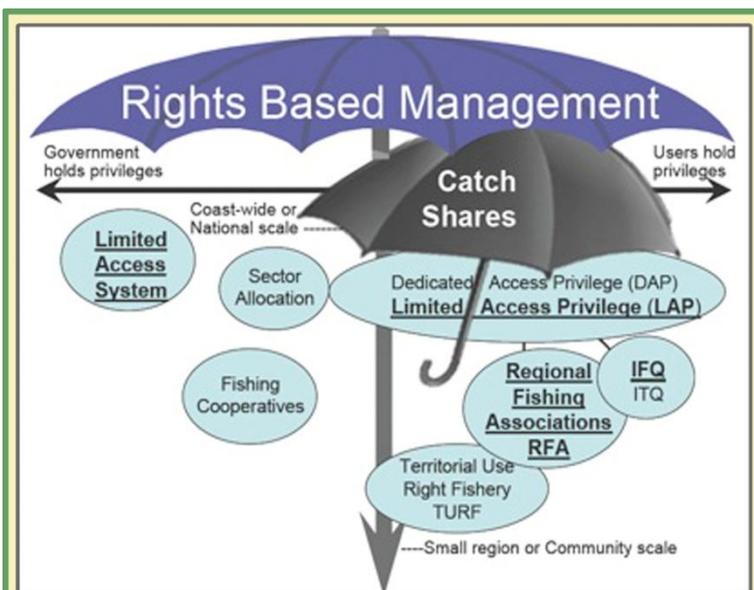
***–Amber Morris***

### **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

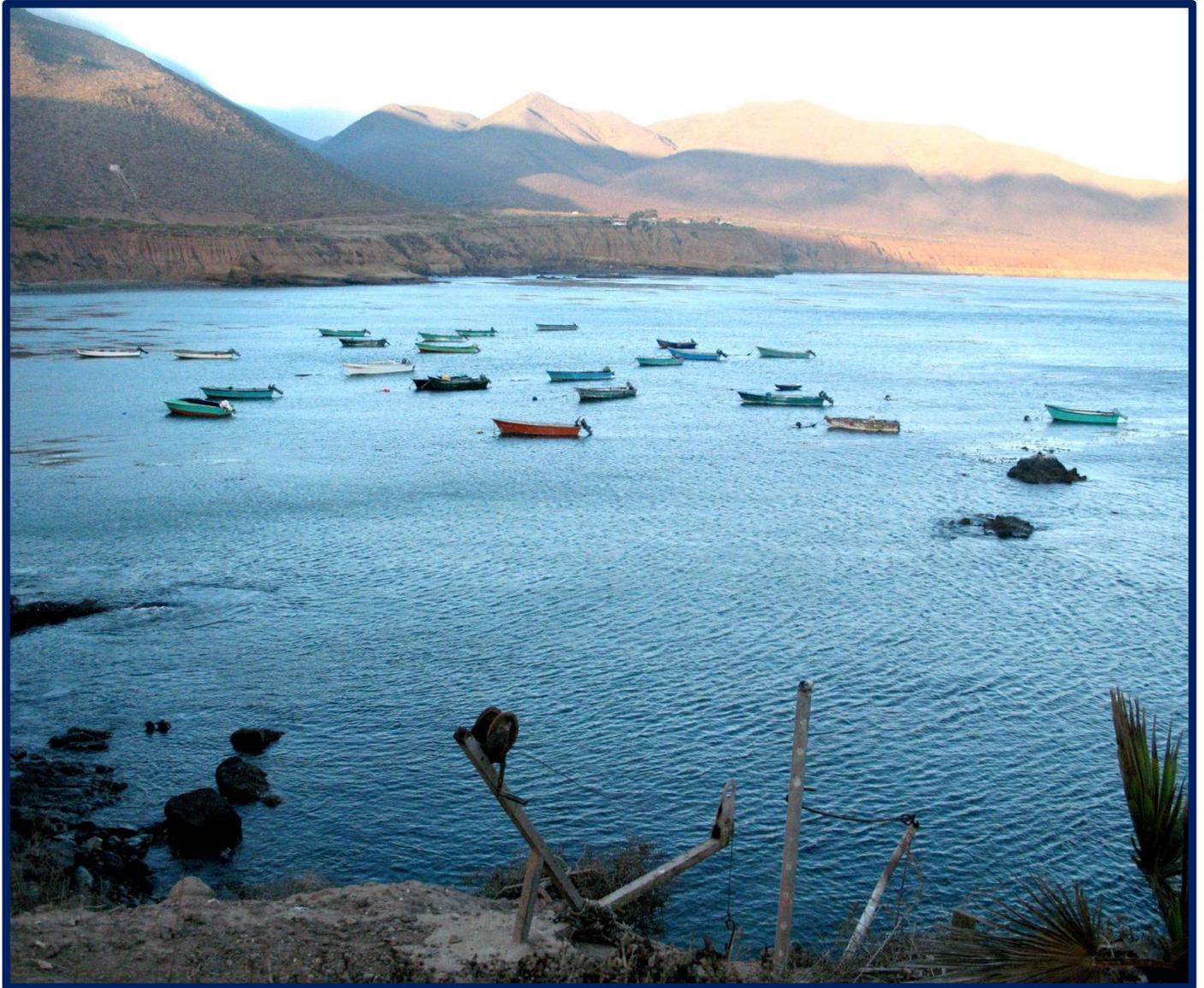
- Seven design components explored<sup>4</sup>
  - Program or permit duration
  - Specification of the management unit
  - Denomination of privilege units
  - Eligibility to acquire or hold privileges
  - Privilege transferability
  - Determination of excessive shares
  - Initial allocation
- Process 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.

<sup>4</sup> 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

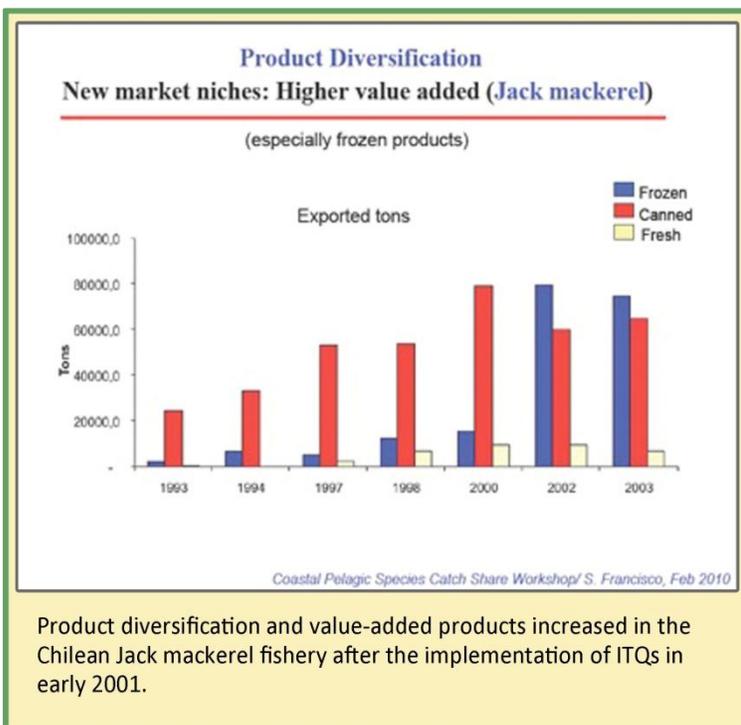
***"People did not want to see job losses in the small scale sector. A law was passed, out of fear of consolidation, to prohibit quota ownership. However, gradual changes later occurred (in the sense of gradually introducing de facto partial or restricted ownership rights over catch quotas) as small 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)*

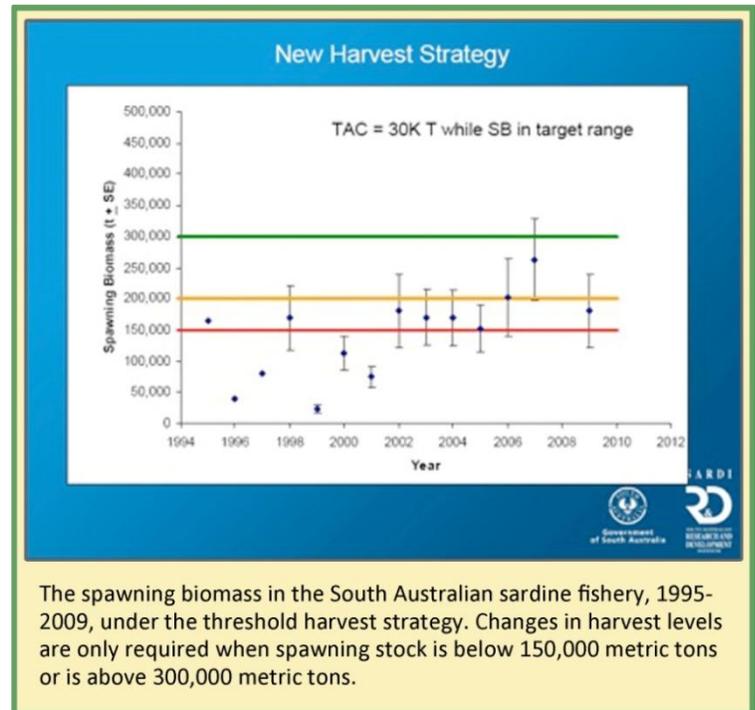
- Optimal Utilization
  - Improve efficiency
    - ◆ High volume, low value is not an option for Australia (i.e., it is not as windy as the West Coast of the U.S. therefore, not as productive)
    - ◆ High value products possible with ITQs
  - Maximize social and economic benefits
- Cost effective management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

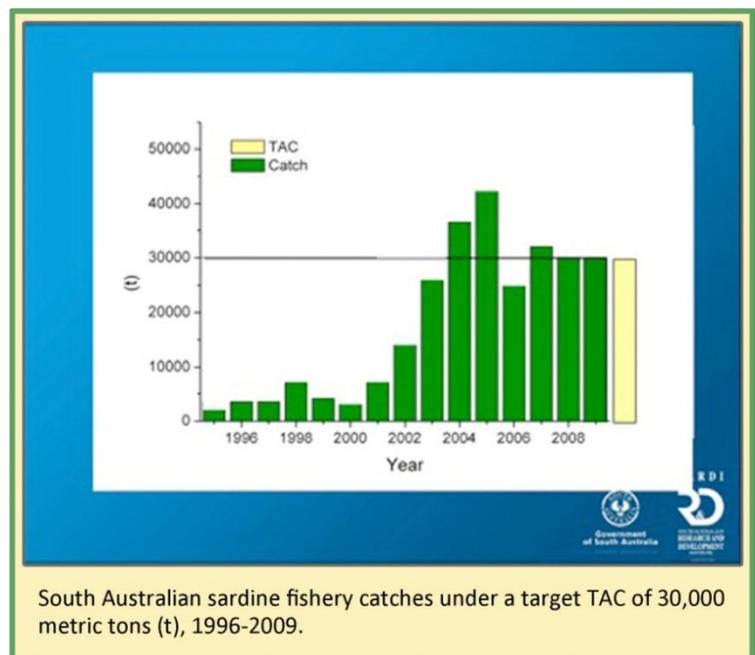
○ *Current Harvest Strategy was Adopted for Market Needs*

- 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

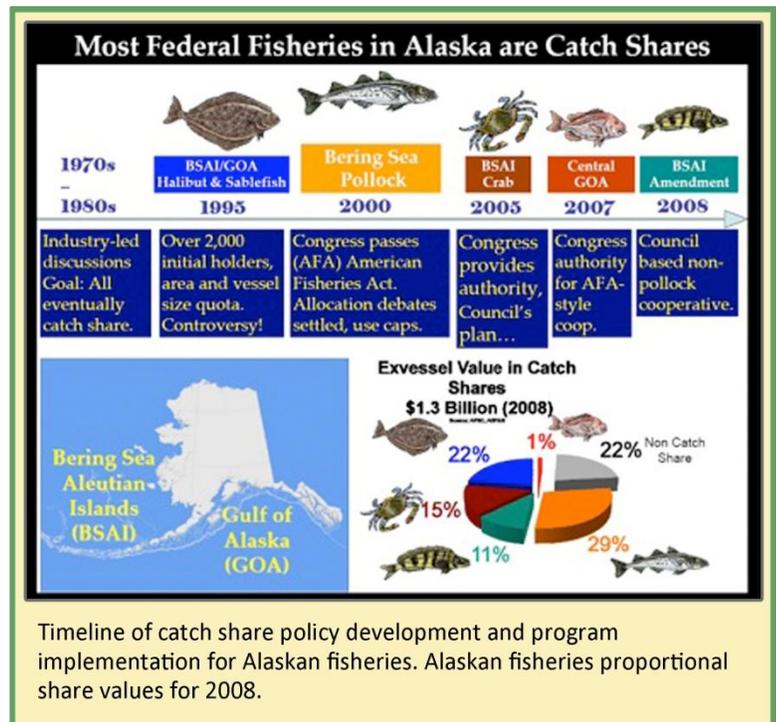
*Glenn Merrill, LAPP Coordinator, Alaska Region, National Marine Fisheries Service*

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*

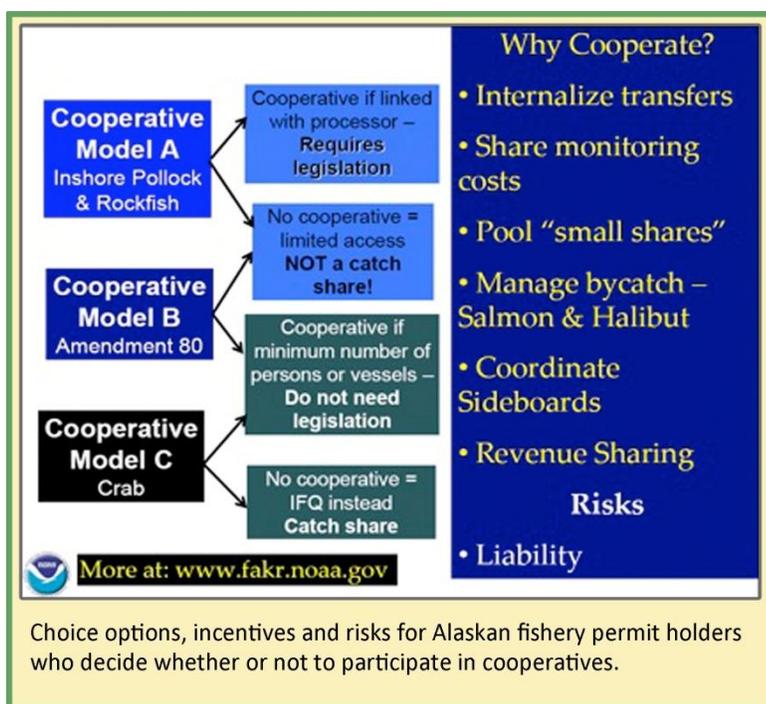
- Enabled CDQ members to self-allocate (typically based on participation with fishery for a given period of time)
- Allowed vertical integration for more security in fresh fish markets
- Required linkages to specific processors for the pollock inshore fishery

○ *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.”