



Catch Share Program Evaluation Methodology

Fall, 2011

As the United States implements more catch share programs to support sustainable fisheries, evaluating program strengths and areas for improvement is not an easy task, but it is an important one. The West Coast Groundfish Trawl Rationalization Program and the Northeast Groundfish Sector Management Program are new, and in order to evaluate these programs and others, managers and stakeholders need to understand their ecological, economic and social impacts.

The Gordon and Betty Moore Foundation awarded MRAG Americas a contract to develop a methodology for evaluating U.S. catch share programs, particularly those for the Northeast and West Coast groundfish because they are politically, economically and ecologically important fisheries. As part of Phase One of the project, MRAG developed a methodology to evaluate the first five years of these two programs based on social, economic and environmental objectives. Phase One of the project was short in duration, and MRAG identified existing or planned studies that could be synthesized, and priority indicators that would complement work being conducted elsewhere. Phase Two, if funded, would actually conduct the work proposed in the methodology, beginning with a thorough vetting of the proposed methodology and priority indicators. Another key task at the outset of Phase Two would be designating a baseline that gives evaluators a starting point for where these two fisheries stood before implementation of catch shares. With additional funding, Phase Two would provide fishery managers and fishermen – in addition to funders, NGOs and government officials – critical information on the performance of catch shares.

This summary describes Phase One, the development of the evaluation methodology. In conjunction with an advisory committee of academic experts, MRAG developed the methodology through a literature review and consultation with experts and stakeholders at workshops in the targeted regions. The methodology was developed using thorough research and discussion with the fishing industry, scientists and management communities.

The proposed evaluation methodology includes five key considerations:

1. **Goals:** Begin by evaluating the program against the goals stated in the catch share/fishery management plan. The program should comply with its own stated goals and objectives, as well as national standards and requirements and other federal catch share laws.
2. **Hypotheses:** Measure the program against anticipated outcomes or predictions based on results of other catch share programs.

3. **Attributes:** Identify attributes that describe one or more elements of the expected outcome of a catch share program. MRAG identified three broad categories of attributes during the evaluation design. These categories umbrella the specific attributes identified for evaluation:

- *Ecological attributes* include stock status, fishing yield vs. quota limits, fishing effort, quota compliance and discarding;
- *Economic attributes* include profitability, quality, efficiency and employment; and
- *Social and governance attributes* include the nature and focus of governance; social changes related to changes in fleet distribution, structure and other matters; and impacts of catch shares on communities.

4. **Indicators:** Develop priority indicators that measure one or more of the fishery attributes listed above that are expected to change with the implementation of a catch shares program. Since indicators can help fishery managers and others make judgments, their objectivity is critical. MRAG identified priority indicators based on expert opinion, technical discussions, data availability and similar work conducted by NOAA Fisheries and others (e.g. economic and social indicators at the Northeast and Pacific Coast Fisheries Science Centers).

The priority indicators developed by MRAG in Phase One of the project—the evaluation methodology—are listed in the table below. The final indicators that would be measured in Phase Two—the evaluation—would be refined by the project team in Fall 2011. Indicators in this project are intended to supplement and synthesize—not duplicate—studies and performance review research conducted by NOAA and others.

	Hypothesis	Attribute	Indicator
Ecological	<i>Stock status should improve to levels that maximize economic gains: under exploited species may experience higher fishing rates and over exploited species may experience lower fishing rates. Inter annual variability in F will be reduced.</i>	1. Stock condition	1.1 Ratio of $B:B_{MSY}$ 1.2 Ratio of $F:F_{MSY}$ 1.3 Number of stocks in rebuilding plans 1.4 Number of stocks where overfishing is occurring
Ecological	<i>If there is high observer coverage and discards count against the quota, we expect little reductions in discard rate. If discards do not count against the quota, there may be highgrading</i>	2. Discarding	2.1 Ratio of discards to landings
Economic	<i>Better match quota holdings with catches</i>		
Social / Governance	<i>Governance by stakeholders over their resources creates incentives for stewardship</i>		

	Hypothesis	Attribute	Indicator
Ecological	<i>Because the penalty for quota overages is directed at the individuals that exceed quota, we expect much fewer instances of fleet-wide quota overages</i>	3. Quota compliance	3.1 Proportion of stocks with C>TAC
Social / Governance	<i>Governance by stakeholders over their resources creates incentives for stewardship</i>		3.2 Changes in incidence/number of violations
Ecological	<i>We anticipate improved ability to avoid constraining species and target more abundant species. This should be reflected in the ability of the fleet to catch the annual catch limit for a larger number of species</i>	4. Ability to match catch to quota	4.1 Number of stocks with C<TAC
Economic	<i>Better match quota holdings with catches</i>		4.2 Cumulative lost yield (and revenue) due to C<TAC
Social / Governance	<i>Governance by stakeholders over their resources creates incentives for stewardship</i>		
Ecological	<i>If the fleet is overcapitalized due to the race-to-the-fish, then there are inefficiencies in fishing effort. Under a catch share system, there is a lower chance of future fishing opportunities being reduced because of fleet wide quota limits, so we expect fishing effort to be spread out over a longer period of time, possible over different fishing grounds. Total amount of fishing effort may increase if they are more able to avoid constraining species, or it may decrease if they are able to be more selective at choosing fishing locations and thereby meet individual or sector-level quotas with less fishing effort.</i>	5. Operational Flexibility	5.1 Total effort
Economic	<i>Shift from maximizing quantity to quality</i>		5.2 Total area fished / year
Social / Governance	<i>Privatization increases flexibility in fishing operations.</i>		5.3 Changes in geographic distribution of fishing effort over time and space 5.4 Changes in locations of where fish are landed, processed, sold 5.5 Amount of new area fished 5.6 Amount of area no longer fished
Ecological	<i>Because catch share systems require good catch accounting systems, we hypothesize that some data (landings) will be available more immediately and can be used to inform in season management. Data on bycatch hotspots might be shared among participants. If the users have a long term stake in the resource, and if they see uncertainty in stock status as a major limit to catch quotas, they we hypothesize that they may invest in cooperative research</i>	6. Data collection to reduce uncertainty and aid management	6.1 Immediacy of information (time lags in data availability) <i>Note: uncertainty will be very difficult to measure</i>
Social / Governance	<i>Catch share programs shift governance activities from federal managers to individuals, sectors, or co-ops</i>	7. Participation in stock assessment/ cooperative research; use of experience-based knowledge	7.1 Incidence of cooperative research events; assessment of quality of industry input into stock assessment

	Hypothesis	Attribute	Indicator
Social / Governance	<i>Catch share programs shift governance activities from federal managers to individuals, sectors, or co-ops</i>	8. Decentralized decision-making	8.1 Delegation of decisions to individual quota holders or sectors versus a government agency 8.2. Flexibility in responding to economic, environmental, and other changes 8.3. Technological and structural innovation 8.4. Diversity in scale, arrangements
Economic	<i>Increase in efficiency</i>	9. Capital and Infrastructure	9.1 Number of active and derelict fishing vessels 9.2 Time period that vessels are for sale
Social / Governance	<i>Extreme consolidation of quota owners leads to failures of small businesses</i>		9.3 Number of shoreside businesses 9.4 Changes in infrastructure (processing, supply, fuel, ice, transportation, support services)
Social / Governance	<i>While privatization of fishing resources can increase profits for individuals remaining in the fishery, negative impacts can have longer-term implications for community stability.</i>	10. Fishing Community Employment	10.1 Changes in hours worked hours / year 10.2 Number of part-time vs. full time jobs; income 10.3 Employment of next generation in fishing versus alternative occupations

5. Design: Review how the evaluation will be implemented. For example, identify what to collect, how to collect it, where data resides, how data gaps will be identified, etc. MRAG recommends that indicator data include both metric and objective data, as well as subjective information from surveys, interviews, ethnographic studies and documentary reviews. Tactics for collecting new information or analyzing existing data may vary depending on the issue, and will be refined further in Phase 2 with additional funding.

While it may take several years to see significant change from a catch share program, it is critical for fishery managers, fishermen and others seeking to evaluate the program to establish a baseline of understanding. The methodology and priority indicators listed above offer a road map for tracking the effects of a catch share transition from initiation through implementation and operational practice. For more information on the methodology and plans for catch share program evaluations in Phase 2, please contact Jill Swasey at MRAG Americas (jill.swasey@mragamericas.com).