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Economic Evaluation of Catch Share Program: Rhode Island Fluke Fishery Sector Pilot Program

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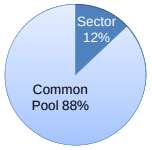
Introduction: Fluke Fisheries in RI

Current management scheme
- Federal government allocates TAC to the states.
- RI Department of Environmental Management (DEM) allocates quota to three sub-periods.
  → Winter I [Jan-April], Summer [May-Oct], Winter II [Nov-Dec]
- Daily landings were restricted by the "possession limit" (aka daily trip limit).
  → Varies from 50lbs/day to 3,000lbs/week.
- Fishery closes when the sub-period quota is reached, and reopens the next sub-period.

Inefficiencies of current scheme
- Regulatory discards due to low possession limits.
- Forced to go out almost everyday due to low possession limits
  → safety issues.
- Derby fishing.

Fluke Sector Pilot Program



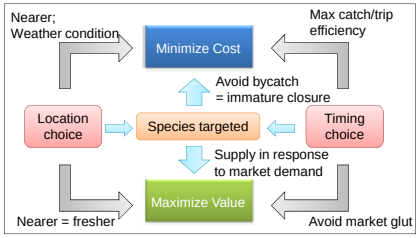
TAC for 2009: 1.68 M lbs

April 2009: RI Fluke Sector Pilot Program launched
- 8 vessels (7 trawlers, 1 gillnet) formed a sector "Rhode Island Fluke Conservation Cooperative (RIFCC)"
- Received 11.53% of RI TAC (176,370 lbs) based on catch history.
- Internally managed as IFQ.

Not without controversies
- "Smaller non-sector boats will be pushed out"
- "Sector vessels will land large amount, driving down fluke price."
- RI Fisheries Management Council voted against (4-3); RI DEM director overturned and gave a go-sign.

Main Research Questions

Are sector members better-off?



→ Behaviors that were restricted under the current management scheme, but became possible with sector program.

Did sector vessels actually engage in these behaviors?

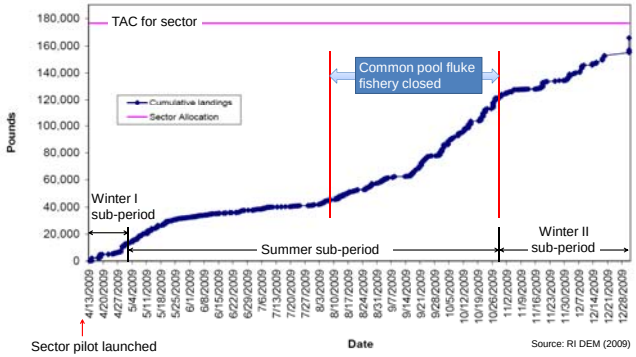
Did they pay off?

Are non-sector members made worse-off?
- Fluke: could benefit from sector program through reduced total landings when the fishery is open.
- Other fisheries: could be adversely affected as sector vessels landed other species while fluke is open to non-sector boats.

Net impact is an empirical question.

Anecdotal Evidence

Cumulative Landing of Fluke by Sector Vessels



Sector vessels focused fluke landings when common pool fishery was closed.
- Fluke caught in other dates are mostly by-catch.
- When common pool fishery was open, sector vessels targeted cod, dogfish, monkfish, whiting, and squid.

Average ex-vessel price for fluke indicates above strategy yielded positive result.
- Sector vessels received higher price, especially when common pool fishery was closed.

Ex-vessel Price of Fluke in RI ($/lb)

Year	Sector vessels		Non-sector: Fed. Permit	Non-sector: State lic. only
	CP Open	CP Closed		
2005	2.81	--	2.62	2.71
2006	3.05	--	3.05	2.64
2007	3.73	--	3.71	2.94
2008	3.96		4.07	2.80
2009	3.33	4.00	3.25	2.48

Source: Data from SAFIS. Calculated by authors.

o CP = common pool fluke fishery.
o All seven sector trawlers are federally permitted. As such, federally permitted non-sector vessels serve better for comparison.
o State licensed boats (non-federal permit holders) are typically small, operates mainly during the summer when fluke migrates nearshore, and often part-time commercial fishermen. Although not directly comparable to sector vessels, these fishermen expressed strong concerns about the pilot program.

Evaluation of the pilot program

Focus on the Revenue of Sector and Non-sector Vessels for 2009
- Fluke is divided into four market categories (jumbo, large, medium, other).
- Cost analysis is in progress.

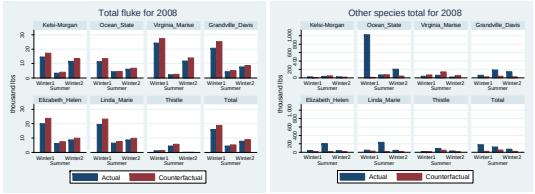
Challenge1: Estimating Counterfactual
- Need to estimate what the 2009 season would have been without the sector program.

Challenge 2: Estimating Effects on Other Targeted Species
- Based on the landing history of sector vessels, we included 20 other non-fluke species.

Methodology Overview
- Used SAFIS data from 2005-09 (price, species, market grade, vessel, dealer, day, etc)
- Reduced form estimation of 24 demand functions (4 fluke categories & 20 species). Ex-vessel price is the dependent variable.
- Estimated functions were used to predict the actual daily prices → factual revenues.

- For counterfactual, each sector vessel was matched to three non-sector vessels based on landing shares by species and number of fished days in 2008, and vessel attributes.
- Main assumption is that non-sector vessels did not alter their behavior in response to sector pilot program.
- Sector vessels' 2009 counterfactual landings were calculated using the actual landing data of matched non-sector vessels.
- Plugged in to estimated demand functions → counterfactual revenues.

Matching "Fit" Using 2008 Data



Estimation Results

Actual, predicted, and counterfactual average revenues of 2009

Species	Estimate	Sector	Non-sector Fed. Permit	Non-sector State lic. only
Fluke	Actual	$ 92,607	$ 31,208	$ 2,181
	Predicted factual	$ 89,151	$ 32,024	$ 2,032
	Counterfactual	$ 76,856	$ 30,669	$ 2,038
Other	Actual	$ 285,775	$ 220,979	$ 6,159
	Predicted factual	$ 297,234	$ 213,913	$ 6,068
	Counterfactual	$ 212,589	$ 211,595	$ 6,046

o All non-sector boats included made at least 10 trips in 2009 and had less than 10% of their landing volume made up by lobster.

Distributional effect of changes in revenues among non-sector boats

Non-sector vessel type	Share (%)		Average amount ($)		
	Rev. increase	Rev. decrease	Rev. increase	Rev. decrease	Rev. change
Fed. Permit	52.4%	47.6%	$4,276	-$925	$1,797
State lic.	47.4%	52.6%	$121	-$79	$16

o These numbers are preliminary and still in progress.

Conclusion

Are sector members better-off? → YES.
- Sector vessels targeted fluke when common pool fluke fishery season was closed (timing choice). This strategy yielded substantially higher ex-vessel price.
- Sector vessels earned on average $12,295 more from fluke, and $84,645 more from other species.
- RI DEM estimated significant drop in discards (60.6lbs/tow in 2008 → 1.9lbs/tow in 2009 (RI DEM 2009)).

Are non-sector members made worse-off? → Minimal, if any.
- Federally permitted vessels were on average made better-off in both fluke and other species fisheries.
- Smaller scale state license boats did not gain much, but also did not lose much.

Need more analysis on distributional effects.
- Preliminary results show that for both non-sector types about half of them were better-off and the other half were made worse-off.
- The magnitude of change, however, was much larger for those who were made better-off.

In-progress and future research
- Cost analysis
- Expand analysis to New England region-wide catch share system.

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