



NOAA
FISHERIES

A Management Bind Evidence for Targeting Weak Stocks

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Aberdeen, Scotland
July 10, 2016

Introduction

The Endangered Species Act: the case of “shoot, shovel and shut-up”

- The Endangered Species Act (ESA) passed in 1973 amid concerns for iconic species.
- Under Section 9 of the ESA it is illegal to kill an endangered species or damage its habitat.
- This has led some landowners to preemptively destroyed habitat of endangered species to avoid costly land-use regulations prescribed under ESA.

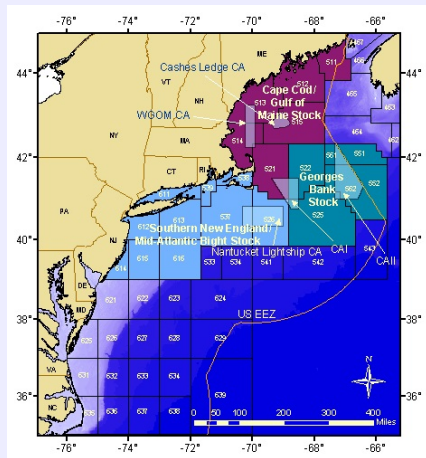
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The Endangered Species Act: the case of “shoot, shovel and shut-up”

- Affected species: red-cockaded woodpeckers in North Carolina, arctic grayling in Montana, “tres amigos” in Texas, etc.
- These incentives have been studied in the economics literature (Innes, Polasky and Tschirhart 1998, Lueck and Michael 2003, Langpap 2006, etc.).

Introduction

Do Similar Incentives Exist in Fisheries?



Yellowtail Flounder in New England

- Georges Bank Yellowtail flounder part of the Northeast multispecies fishery.
 - Harvested by groundfish fishermen targeting primarily haddock, winter flounder, and cod.
 - Bycatch in much more valuable scallop fishery.
 - Sub-ACL on Georges Bank for each.

Table: Groundfish and Scallop Fishery Values

Fishing Year	Groundfish (\$ million)	Scallop (\$ million)	Yellowtail (\$ million)
2010	83.0	450.3	3.9
2011	88.6	580.5	5.7
2012	67.7	558.3	4.6
2013	55.0	467.0	2.5

Yellowtail Flounder in New England

- Georges Bank yellowtail flounder Groundfish ACL for 2012 was reduced by 70% (September of 2011).
- 55 vessels caught yellowtail flounder in 2011. 10 permit owners caught 60% of the harvest (compared to 45% in 2010).

Table: Georges Bank Yellowtail Flounder Fishery

Fishing Year	Aggregate Catch (mt)	Annual Catch Limit (mt)	Percent Caught
2010	757.6	823	92.1%
2011	990.0	1,142	86.7%
2012	215.5	368.3	58.5%
2013	55.8	154.5	36.1%

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Yellowtail Flounder and the Scallop Fishery in the Georges Bank

- Bycatch allowance of yellowtail flounder for scallop fishery reduced by 22% in 2012 despite request for double that.

Table: Georges Bank Yellowtail Flounder Catch and Annual Catch Limits for Scallop Fishery

Fishing Year	Aggregate Catch (lbs)	Annual Catch Limit (lbs)	Percent Caught	Open Area Yellowtail (lbs)	Open Area Scallop (\$)
2010	38,801	321,875	12.1%	—	\$15.6 million
2011	184,987	442,668	41.8%	94,737	\$56.6 million
2012	361,557	345,905	104.5%	46,715	\$115.7 million
2013	82,630	91,492	90.3.4%	35,227	\$117.7 million

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- Fleet managed to minimize its bycatch of yellowtail flounder in the Open Area despite doubling its catch and revenues from that area.

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- The 10 groundfish permits that caught 60% of the yellowtail in 2011 owned by scallopers.

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Yellowtail Flounder in New England

- 16% of all yellowtail biomass on Georges Bank was estimated to have been caught in 2011.

Table 61: Catch and model results table for Georges Bank yellowtail flounder. All weights are in (mt). The average survey biomass in year y is the arithmetic average of the year y DFO, year y NEFSC spring, and year y-1 NEFSC fall surveys. The exploitation rate is the catch divided by the average survey biomass. Model results are from the current updated empirical approach assessment.

	2010	2011	2012	2013	2014
<i>Data</i>					
US landings	654	904	443	130	70
US discards	289	192	188	49	74
Canadian landings	17	22	46	1	1
Canadian discards	210	53	48	39	14
Other catch	0	0	0	0	0
Catch for Assessment	1,170	1,171	725	218	159
<i>Model Results</i>					
Average Survey Biomass	19,117	7,328	9,921	4,938	2,240
Exploitation Rate	0.061	0.16	0.073	0.044	0.071

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Yellowtail Flounder in New England

- Yellowtail flounder as % of total catch increased by 70% in 2011 in Georges Banks.

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What About Other Areas?

- Yellowtail flounder TAC for 2012 remained essentially unchanged in the Gulf of Maine. Yellowtail flounder as % of total catch remained unchanged in the Gulf of Maine in 2011.

Table: Cape Cod/Gulf of Maine Yellowtail Flounder Fishery

Fishing Year	Aggregate Catch (mt)	Annual Catch Limit (mt)	Percent Caught
2010	596.7	779	76.6%
2011	760.2	940	80.9%
2012	957.6	1,046	91.5%
2013	380.5	479	79.4%

Yellowtail Flounder in New England

- Exploitation rate of yellowtail flounder remains similar in 2011 in the Gulf of Maine.

Table 21: Catch and model results for Cape Cod-Gulf of Maine yellowtail flounder. All weights are in (mt), recruitment is in (000s) and F_{Full} is the average fishing mortality on ages (ages 4 and 5). Model results are from the current updated VPA assessment without any retrospective adjustment.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<i>Data</i>										
Commercial discards	282	85	141	156	175	87	74	146	86	54
Commercial landings	715	534	492	543	464	546	684	946	590	421
Total Catch for Assessment	997	620	633	699	639	633	758	1,092	676	475
<i>Model Results</i>										
Spawning Stock Biomass	687	668	789	944	1,120	1,474	1,659	1,285	1,179	1,695
F_{Full}	1.685	1.48	1.056	1.163	0.745	0.491	0.645	0.977	0.818	0.355
Recruits <i>age</i> 1	2,927	3,593	3,458	3,816	4,151	3,542	3,332	4,666	8,013	10,268

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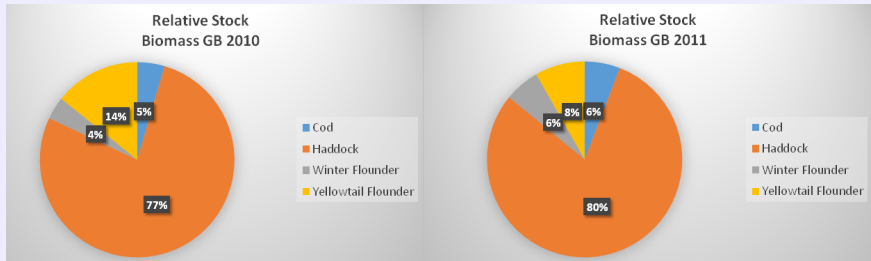
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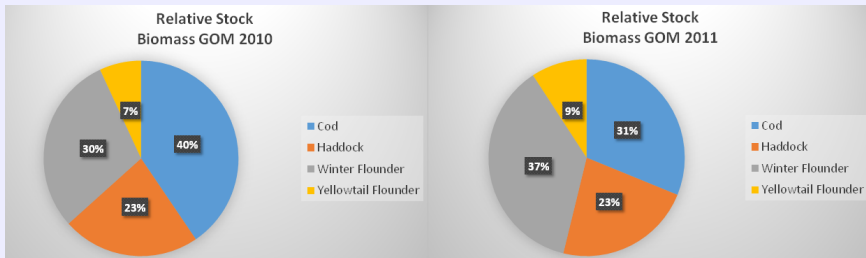
Yellowtail Flounder in New England

- Differences between GB and GOM not explained by the relative abundance of target species.



Yellowtail Flounder in New England

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Yellowtail Flounder in New England

- Differences between GB and GOM not explained by differences in target species ACLs.

Table: ACLs and Cumulative Catch for main New England Stocks

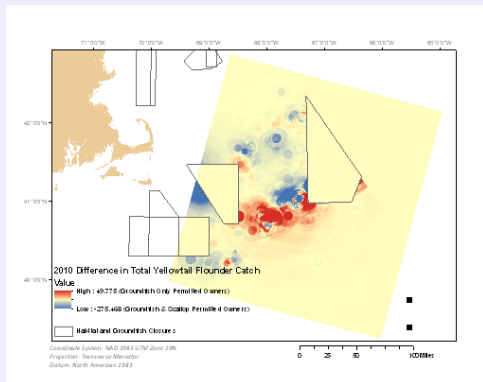
Stock	2010 ACL (mt)	2010 Total Catch (mt)	2011 ACL (mt)	2011 Total Catch (mt)	2012 ACL (mt)	2012 Total Catch (mt)
GB Cod	3,430	2,830	4,301	3,277	4,605	1,622
GOM Cod	4,567	3,843	4,825	4,462	3,699	2,211
GB Winter Flounder	1,852	1,391	2,007	1,925	3,387	1,932
GOM Winter Flounder	158	106	329	161	715	260
GB Haddock	40,440	8,340	30,580	3,841	27,438	1,198
GOM Haddock	825	378	778	486	653	246

Georges Bank Catch

- Revenue/lb of yellowtail decreased from \$16.4 to \$11.3, but remained the same in the Gulf of Maine. (\$13.0).
- Yellowtail catch/unit of effort decreases.
 - 363 lbs/Day at sea in 2010.
 - 274 lbs/Day at sea in 2011.
- Not a result of relative prices.
 - Weighted price of \$1.51 in 2010.
 - Weighted price of \$1.77 in 2011.

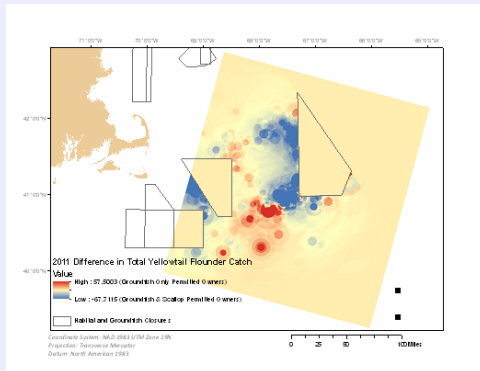
Yellowtail Flounder and the Scallop Fishery in the Georges Bank

- 2010 Spatial distribution of the difference in total catch for Georges Bank Yellowtail Flounder, by owner group



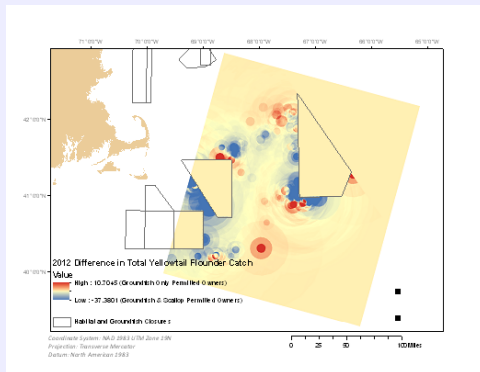
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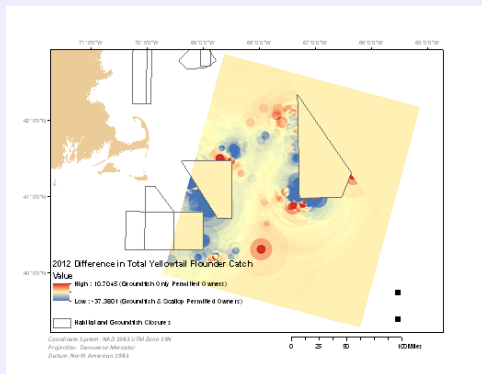
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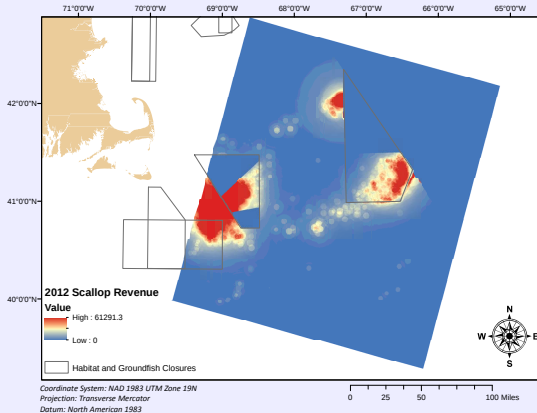
Yellowtail Flounder and the Scallop Fishery in the Georges Bank

- The overlap in fishing areas for the two ownership groups decreased significantly (10% level) between 2010 and 2011, but remained constant between 2011 and 2012.



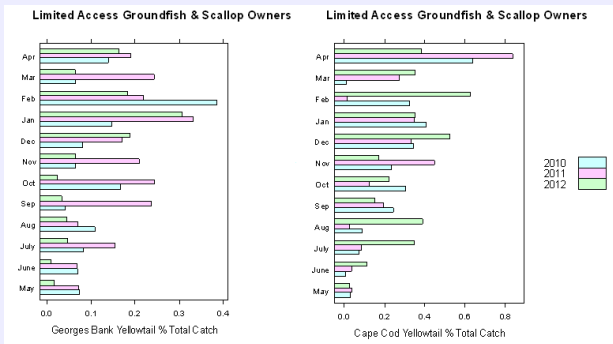
The Scallop Fishery in the Georges Bank

- Overlap between Scallop revenue and yellowtail landings increased from 0.26 in 2010 to 0.42 in 2011.



Yellowtail Flounder and the Scallop Fishery in the Georges Bank

- Groundfish permits owned by scallop fishermen using their yellowtail flounder quota to target the species in the scallop beds in Georges Bank.



Summary

- Targeting of Yellowtail seems to coincide with announcement of next period reductions in TACs.
 - Shift in harvesting towards scallop beds.
 - Decrease in revenue per lb of yellowtail.
- Does not coincide with:
 - Relative biomass fluctuations.
 - Relative TACs in 2011.
 - Relative price changes.
- No similar response for Cape Cod Yellowtail.

Questions?

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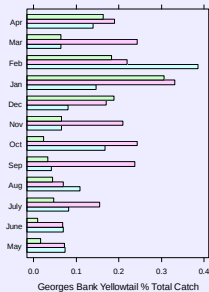
Table: Biomass for main New England Stocks

Stock	2010 Spawning Stock Biomass (mt)	2011 Spawning Stock Biomass (mt)	2012 Spawning Stock Biomass (mt)
GB Cod	6,108	5,231	4,066
GOM Cod	8,638	5,617	2,954
GB Winter Flounder	4,997	5,157	4,828
GOM Winter Flounder	6,341	6,666	3,337
GB Haddock	103,889	71,076	65,848
GOM Haddock	4,877	4,086	4,551

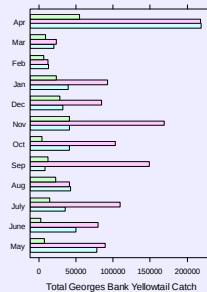
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Limited Access Groundfish & Scallop Owners



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Percent Revenue by Key species

Table: Trip Revenue for Main New England Stocks

Stock	2010	2011	2012
	Revenue (%)	Revenue (%)	Revenue (%)
Haddock	52	30	10
Winter Flounder	18	25	47
Cod	12	11	11
Yellowtail Flounder	8	11	6