



New England Fishery Management Council

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E.F. “Terry” Stockwell III, *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: Sept. 7, 2016
TO: Groundfish Committee
FROM: Groundfish Plan Development Team
SUBJECT: **Re: Directed Atlantic Halibut Fishery in the State of Maine**

At the Groundfish Committee meeting on June 9, 2016, industry members of the federal commercial groundfish fishery raised concerns that recent catches of Atlantic halibut in Maine state waters in the directed Atlantic halibut fishery continue to increase, and the situation may lead to the triggering of accountability measures (AMs) for the federal commercial groundfish fishery in the near-term. Based on these discussions, the Groundfish Committee passed the following motion:

To task the PDT to evaluate recent state landings of halibut through FY 2015, and including FY 2016 preliminary catch information, if available, as well as the number of Maine state permits issued from 2010-2016, to inform whether Atlantic halibut management should be adjusted. (9/0/1)

Rationale: The federal commercial groundfish fishery is fully accountable for any overages of the total ACL of Atlantic halibut and subject to accountability measures. An examination of the impact of the state waters fishery for halibut in Maine is needed to understand how the directed fishery in Maine might be impacting the federal commercial groundfish fishery.

1. Atlantic Halibut Rebuilding, Stock Status and Recent Assessment Findings

Atlantic halibut is in a rebuilding plan with an end date of 2056, with a 50% probability of achieving the rebuilding target. The most recent stock assessment in 2015 was an update to the benchmark model in 2008, which was updated in 2012. At the 2015 Groundfish Operational Updates, the peer review concluded that the Atlantic halibut model was not acceptable as a scientific basis for catch advice, and that stock status and catch advice should be based an alternative approach. Because a stock assessment model framework is lacking, it is not possible to calculate historical estimates of biomass, fishing mortality rate, or recruitment. Status determination relative to reference points is therefore not possible. The panel concluded for Atlantic halibut that overfishing status is unknown, but based on the long-term exploitation history and survey trends, the stock is still overfished.

The panel recommended a new benchmark assessment to determine stock identity, to develop a new stock assessment model and to reconsider the overfishing definition. The panel further recommended that all information on stock identity should be considered, and new information should be collected if necessary. The panel suggested developing a transboundary assessment if the U.S. resource is a portion of the larger northwest Atlantic resource, but recommended a data-limited assessment if the U.S. resource is a self-sustaining stock. Additionally, the panel suggested that future assessment consider new information on discard mortality of Atlantic halibut.

2. Recent Federal Management

Amendment 16 to the Northeast Multispecies Fishery Management Plan implemented a new minimum size for Atlantic halibut, which was increased to 41 inches (104.1 cm.) from 36 inches (91.4 cm) in total length. This measure applies to all commercial and recreational groundfish vessels. This increase in the minimum size matched the median length at maturity for female halibut in the Gulf of Maine. This change was expected to slightly increase opportunities for additional halibut to spawn prior to capture and improve the likelihood that the stock would meet rebuilding objectives.

Vessels with a Northeast multispecies permit are currently allowed to land one legal sized Atlantic halibut per trip. The federal groundfish fishery (sectors and common pool vessels) are the components of the fishery held accountable for an overage of the catch limits. The AMs for Atlantic halibut do not apply to state only permitted vessels and other subcomponents of the Atlantic halibut fishery.

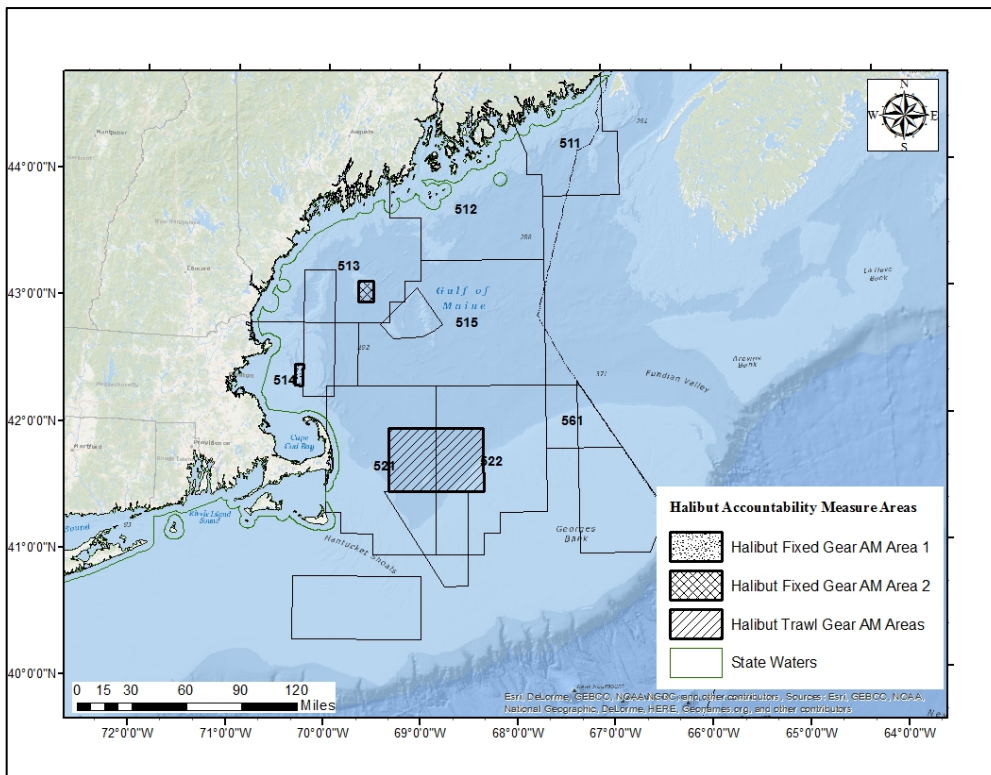
As modified by Framework Adjustment 47 and 48, the AMs for Atlantic halibut are triggered when there is an overage in the overall annual catch limit (ACL) that is greater than the uncertainty buffer in any fishing year (i.e., exceeding the acceptable biological catch, ABC). If the AM is triggered, vessels possessing a Northeast multispecies permit or vessels operating under a Category C or D limited access monkfish permit would not be allowed to retain Atlantic halibut. In addition, gear restricted areas would be triggered. Trawl vessels possessing a northeast multispecies permit must use approved selective gear (e.g., haddock separator trawl, Rhule trawl, rope separator trawl) that reduces catch of flounders in the Atlantic Halibut Trawl Gear AM Area (Refer to Map 1). Gillnet and longline vessels possessing a Northeast multispecies permit may not fish within the Atlantic Halibut Fixed Gear AM Areas (Map 1).

The AMs would be in place for a full fishing year, starting on May 1. The AM for an Atlantic halibut catch overage could apply in the next fishing year following an overage, or in the second fishing year following an overage depending on the availability of information. For example, If NMFS made a determination that an overage occurred in FY2015 before FY2016 began, then the AM could apply in FY2016. However, if NMFS made the determination that an overage occurred during the FY2015, and the information was made available until after FY2016 began, then the AM would apply to FY2017. For FY2015, it is currently unknown whether there has been an overage to trigger an AM.

The AMs were designed to correct for an overage of up to 20 percent. Framework Adjustment 48 explains that the Council would review the AMs in a future action if an overage greater than 20% occurred.

Once the AMs are triggered, fishing opportunities would be reduced, particularly within the AM areas, and would cause adverse impacts to the groundfish fleet. The estimated economic impact of the halibut AMs was most recently evaluated in FW 48.

Map 1 - Map of Atlantic Halibut Accountability Measure Areas



3. Modified from the Economic Impact Analysis from FW 48 which used FY 2010 economic data

Trawl vessel restrictions

The AM requires the use of selective trawl gears in the Atlantic Halibut Trawl Gear AM area. Approximately \$5.5 million dollars of estimated gross revenues came from this area with trawl gears in FY 2010 (Table 1). These revenues represent the upper bound cost associated with this area using FY 2010 data. It is, however, likely that only a portion of these revenues will be affected, as vessels may still elect to fish inside this area with selective gear or increase their fishing efforts outside this area. The most impacted port is New Bedford, MA based on FY 2010 data.

Table 1- Gross revenue from VTR trips reported inside the Atlantic Halibut Trawl Gear AM area during FY 2010.

Port	Gross Revenue
Boston, MA	\$ 204,404
Gloucester, MA	\$ 445,429
New Bedford, MA	\$ 4,606,611
Nantucket, MA	\$ 122,397
Barnstable, MA	\$ 1,589
Point Judith, RI	\$ 56,062
Grand Total	\$ 5,436,491

Selective gears substantially change the composition of the catch. Both VTR and observer data collected from tows inside the areas show a much higher proportion of haddock and lower proportion of flatfish relative to traditional trawl gears (Table 2). Revenue per observed tow were about 12 percent higher with the selective gears than with traditional gear for observed tows in the large areas (Table 3).

Table 2- FY 2010 revenue by species and proportion of total kept catch from VTR and on observed trips using selective (i.e., separator, Rhule) and traditional (otter) trawl gears inside the Atlantic Halibut Trawl Gear AM area.

	Observer				VTR			
	selective		traditional		selective		traditional	
cod	\$ 35,711	13.8%	\$ 364,444	17.5%	\$ 13,590	23.1%	\$ 727,859	13.5%
haddock	\$ 129,036	50.0%	\$ 784,196	37.6%	\$ 35,445	60.3%	\$ 1,738,837	32.3%
flats	\$ 11,895	4.6%	\$ 272,928	13.1%	\$ 3,624	6.2%	\$ 1,002,378	18.6%
pollock	\$ 50,824	19.7%	\$ 116,162	5.6%	\$ 3,746	6.4%	\$ 190,192	3.5%
white hake	\$ 40	0.0%	\$ 513	0.0%	\$ -	0.0%	\$ 588	0.0%
skates	\$ 2,306	0.9%	\$ 25,317	1.2%	\$ -	0.0%	\$ 1,004,889	18.7%
other	\$ 28,224	10.9%	\$ 520,649	25.0%	\$ 29	3.9%	\$ -	13.3%
squids	\$ -	0.0%	\$ 85	0.0%	\$ 2,310	0.0%	\$ 713,003	0.0%
Grand Total	\$ 258,036		\$ 2,084,294		\$ 58,745		\$ 5,377,746	

Table 3- FY 2010 revenue per tow by two types of trawl gears from tows observed inside the Atlantic Halibut Trawl Gear AM area.

Trawl net	Revenue per tow	Number of tows
selective	\$1,518	172
traditional	\$1,353	1,541

Fixed gear vessel restrictions

The AM prohibits fishing with fixed gears in the Atlantic Halibut Fixed Gear AM Areas. In this case, all of the fixed gear fishing activities that occurred in these areas would be displaced, and the costs would be those associated with potentially lower catch rates and/or longer steaming time. Approximately \$1 million in estimated revenue in FY 2010 came from trips reported fishing inside these areas (Table 4). The majority of the revenue came from cod (Table 5).

Table 4- Gross revenues from VTR trips reported inside the Atlantic Halibut Fixed Gear AM Areas during FY 2010.

Port	Gross revenue
Portland, ME	\$ 58,196
Harpswell, ME	\$ 63,342
Gloucester, MA	\$ 268,373
Chatham, MA	\$ 629,830
Portsmouth, NH	\$ 1,878
Seabrook, NH	\$ 14,005
Grand Total	\$ 1,039,368

Table 5- FY 2010 revenue of total kept catch by species from VTR and on observed trips inside the Atlantic Halibut Fixed Gear AM Areas.

Species	Observer	VTR
cod	\$ 16,677	\$ 529,950
haddock	\$ 4,812	\$ 74,247
flats	\$ 346	\$ 34,350
pollock	\$ 2,668	\$ 154,034
white hake	\$ 5	\$ 271
skates	\$ 765	\$ 20,151
other	\$ 4,527	\$ -
squids	\$ -	\$ 226,365
Grand Total	\$ 29,798	\$ 1,039,368

4. State of Maine Directed Atlantic Halibut Fishery Management

Overview of Maine State Waters Halibut Longline Fishery 2002-2016

Regulations

2002 – 2009

Applies to commercial, recreational, and party/charter

Season: East – (Maine territorial waters east of a line running due south magnetic of Schoodic Pt.) May 1 through July 31

West – (west of above line) April 1 through June 30

Minimum size: 38 inches (96.5 CM)

Possession Limits: Illegal to possess or land marine species other than Atlantic halibut aboard commercial vessels. It is illegal to possess or land Atlantic halibut smaller than 38 inches total length, head-on or off. No more than one halibut per day for recreational, party or charter vessels. Commercial, recreational, party, or charter vessels may land no more than 50 Atlantic halibut per season.

All legal size Atlantic halibut caught and intended to be retained by a Commercial Fishing license holder or recreational fisherman shall be immediately tagged with a landing tag approved by the Maine Department of Marine Resources.

Commercial fishing license holders must declare the vessel at the time of license issuance or renewal, to which the license holder's tags will be allocated pursuant this endorsement. The owner of the vessel will be given priority in the issuance of tags.

Gear Types and Limits: Only method allowed is using circle hooks, sizes 14/0, 15/0, or 16/0. Nor more than 450 circle hooks per vessel. All longline or tub trawls must be marked with name, commercial fishing license number or for recreational fishermen, name and "Halibut Trawl".

2010 – present

Applies to commercial, recreational, and party/charter

Season: May 1 through June 30

Minimum size: 41 inches (104.1 CM)

Possession Limits: Illegal to possess or land marine species other than Atlantic halibut aboard commercial vessels. Illegal to possess or land Atlantic halibut smaller than 41 inches total length, head-on or 32 inches head-off. No more than one halibut per day for recreational, party or charter vessels. Commercial, party, or charter vessels may land no more than 25 Atlantic halibut per year. Recreational vessels may land no more than 5 Atlantic halibut per year. No individual or vessel will be issued more than 25 tags per calendar year with the exception of Federal Multispecies Permit Holders. Federal groundfish permit holders may be issued more than 25 tag per person, but the 25 tag per vessel limit still applies.

- Tags must be declared to a vessel at the time of issuance.
- **Vessels may land a maximum of 25 Atlantic halibut per year.**
- Additionally, federal regulations restrict vessels to one halibut per trip whether fishing in State or Federal waters.
- Illegal for more than one type (recreational or commercial) of landing tag to be assigned to any one vessel per year.
- No individual may possess more than one type of landing tag per year.

All legal size Atlantic halibut caught and intended to be retained by a Commercial Fishing license holder or recreational fisherman shall be immediately tagged with a landing tag approved by the Maine Department of Marine Resources, regardless of when or where taken either inside the Three Mile Limit or in Federal Waters. Three types of tags are issued: Maine State Commercial for individuals that do not possess a federal multispecies permit and are therefore restricted to Maine territorial waters, Commercial Federal for individuals who possess a federal multispecies permit and can access federal waters (these individuals may also access ME waters if they possess the proper licenses), and Recreational for halibut caught in ME or federal waters by recreational, party or charter vessels. No individual or vessel may possess more than 1 type of tag per year.

Commercial fishing license holders must declare the vessel at the time of license issuance or renewal, to which the license holder's tags will be allocated pursuant this endorsement. The owner of the vessel will be given priority in the issuance of tags. The license holder may only fish for halibut from the vessel that was declared and that the tags were allocated. Commercial fishing license holders who also hold a Federal Multispecies Permit shall be exempted from the individual tag limit provided that no federally permitted vessel is assigned more than 25 tags per year.

Gear Types and Limits: Only method allowed is using circle hooks, sizes 14/0, 15/0, or 16/0. No more than 450 circle hooks per vessel. Recreational fishermen or commercial fishing license holders without the halibut endorsement when fishing for personal use, using a tub trawl, are restricted to 100 hooks. All longline or tub trawls must be marked with name, commercial fishing license number or for recreational fishermen, name and "Halibut Trawl".

Reporting Requirements:

Atlantic halibut Persons who obtain an Atlantic halibut endorsement will be required to maintain a log. The log must include the following information:

1. Harvester name & license number
2. Boat name and hull ID
3. Designate negative report period if no harvesting activity occurred
4. Date fished & landed
5. Number of crew (including captain)
6. Gear type & quantity
7. Number of sets
8. Set time (hours gear fished)
9. Depth (in fathoms)
10. Area fished (Latitude/Longitude in dd/mm/ss, or Loran bearings, or NMFS statistical area and distance from shore)

11. Sea time (including steaming time)
12. Species caught including bycatch and sub-legal halibut, quantity & unit of measurement
13. Total length of halibut retained or released
14. Research tag number of halibut released or recaptured
15. License number of dealer sold to or if not sold to a licensed dealer, disposition of catch.
16. Port landed
17. Signature written or electronic

They are encouraged to make negative reports but it's not required to obtain future halibut endorsements.

The number of endorsements issued for 2016 is 858, which translates to 21,450 landings tags.

Landings Data

All data were pulled on 8/10/2016

*2015 data are preliminary and subject to change without notice.

All data except Maine Dealer Landings were pulled from harvester reported data. Dealer data comes from www.maine.gov/dmr.

Figure 1 shows the State waters fishery catches in total metric tons (mt), landed mt, and discard mt from the harvester database, as well as the reported Maine dealer landings (mt) for 2002-2015. The 2015 harvester data was not included as it is preliminary and does not represent the entire season. The allotted state waters sub-component is shown in the double dashed line. As you can see dealer landings have exceeded the state water's allowable catch limit (ACL) for 2015. Dealer landings include those from federal waters, but historically the longline landed accounts for approximately 90% of the dealer landings. Up until 2015, the fishery had not exceeded the state waters sub-component and it is questionable that it would if the state waters sub-component had remained estimated at 42 mt. The number of discards in each year remains fairly constant, especially when compared to the catch of legal fish. Participants are required to report all undersized fish caught with lengths in their logbooks, but all fish may not be reported. There is no way to verify the discards.

Figure 1- Maine state waters fishery catches in total metric tons (mt), landed mt, and discard mt from the harvester database, as well as the reported Maine dealer landings (mt) for 2002-2015.

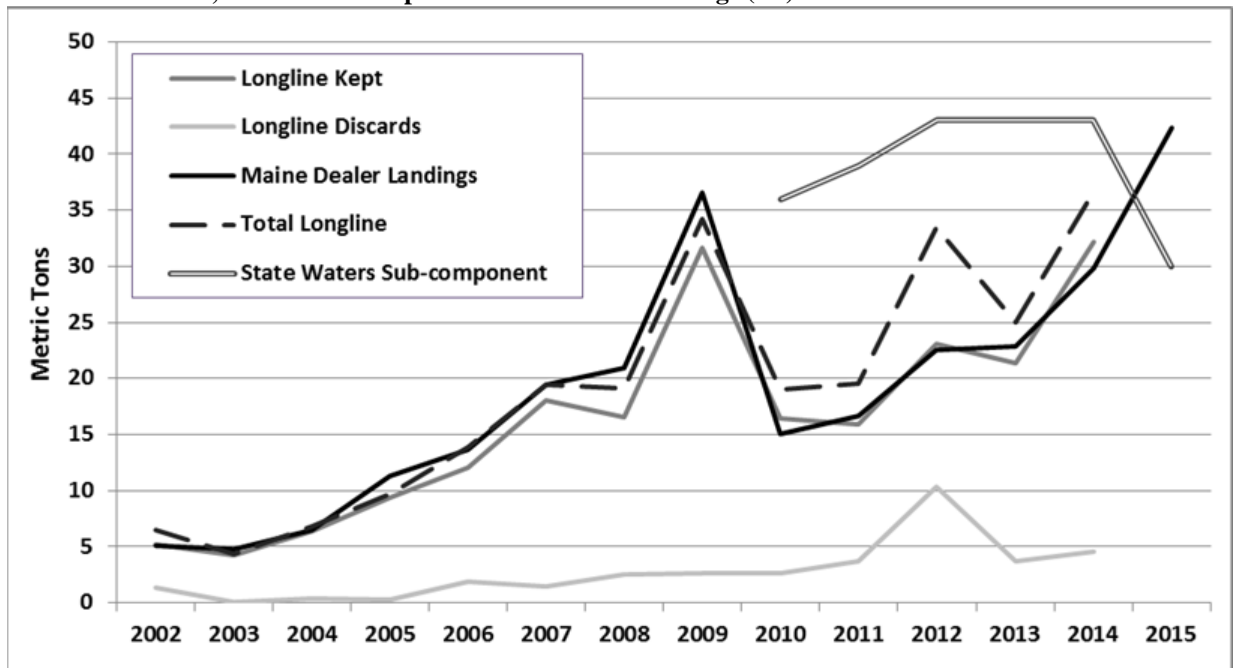


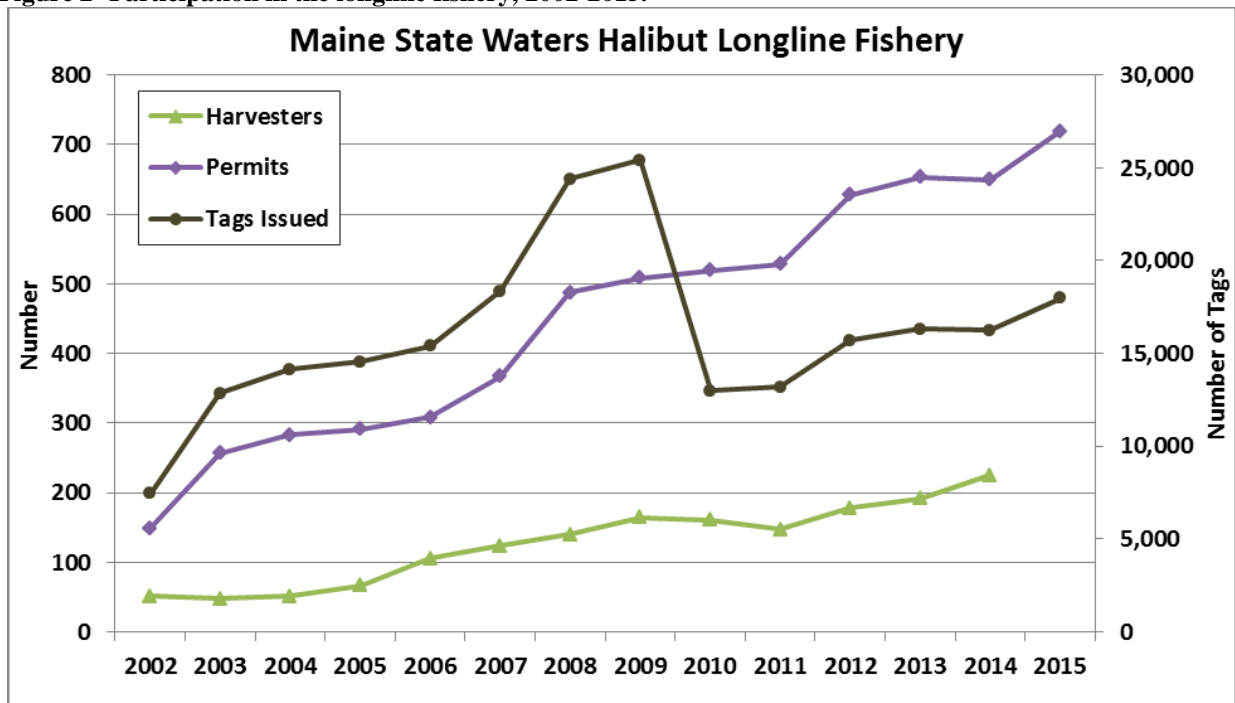
Table 6- State waters fishery catches in total metric tons (mt), landed mt, and discard mt from the harvester database, as well as the reported Maine dealer landings (mt) for 2002-2015, as in Figure 1.

Year	Longline Kept	Longline Discards	Maine Dealer Landings	Total Longline
2002	5.11	1.33	5.07	6.44
2003	3.71	0.60	4.75	4.31
2004	6.24	0.52	6.54	6.76
2005	8.85	0.67	11.30	9.52
2006	11.93	1.68	13.61	13.62
2007	16.38	2.80	19.44	19.18
2008	15.37	3.42	20.99	18.79
2009	30.25	3.53	36.61	33.78
2010	16.18	2.58	15.03	18.76
2011	15.77	3.48	16.60	19.25
2012	22.57	9.80	22.58	32.37
2013	21.64	3.71	22.90	25.35
2014	31.38	4.41	29.85	35.79
2015	15.02*	1.99*	42.36	17.01*

*2015 data is incomplete and subject to change

Participation in the longline fishery has been increasing since its start Figure 2. Numbers of active harvesters for 2015 were excluded due to a partial dataset. The number of landings tags issued dropped in 2010 from 50 down to 25. As shown in Figure 2, the number of harvesters reporting at least one fish has increased at a lower rate than permits issued. There is no way to calculate latent endorsements and although negative reporting is required, it is not strictly enforced.

Figure 2- Participation in the longline fishery, 2002-2015.



As effort has increased, the number of fish caught per year has as well. There is a drop in 2010 as a result of the reduction in seasonal possession limits, Figure 3. On average, approximately 60 % of the harvesters land between 1 and 5 fish and less than 10% reported landing more than 20 fish.

Figure 3- Trend in catches, 2002-2014.

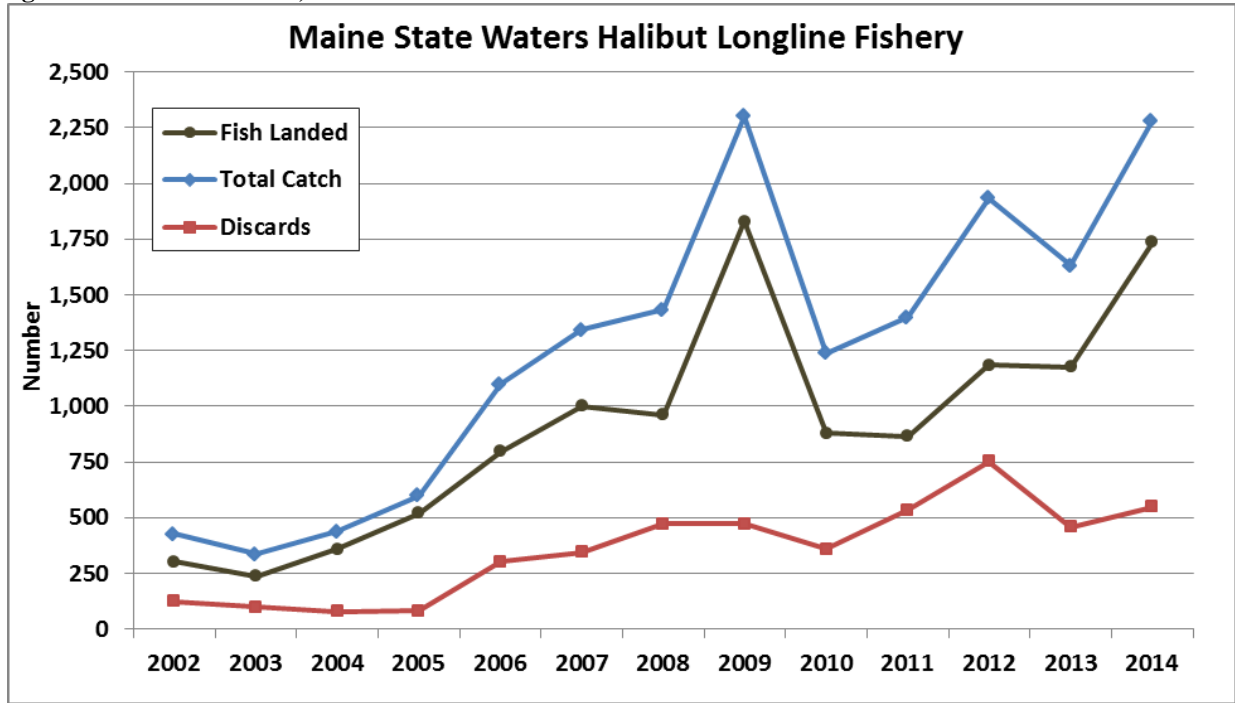


Table 7- Permits, tags, and catches of halibut, 2002-2016.

Year	Harvesters with Fish Caught	Fish Kept	Fish Caught	Permits	Tags Issued
2002	51	303	427	149	7450
2003	48	237	336	257	12850
2004	51	359	438	283	14150
2005	67	520	600	291	14550
2006	106	797	1,099	308	15400
2007	124	1,000	1,344	367	18350
2008	140	961	1,433	488	24400
2009	164	1,830	2,301	508	25400
2010	161	879	1,238	519	12975
2011	147	865	1,398	528	13200
2012	178	1,183	1,934	628	15700
2013	192	1,176	1,632	653	16325
2014	225	1,736	2,283	650	16250
2015	162*	815*	1,035*	719	17975
2016				858	21450

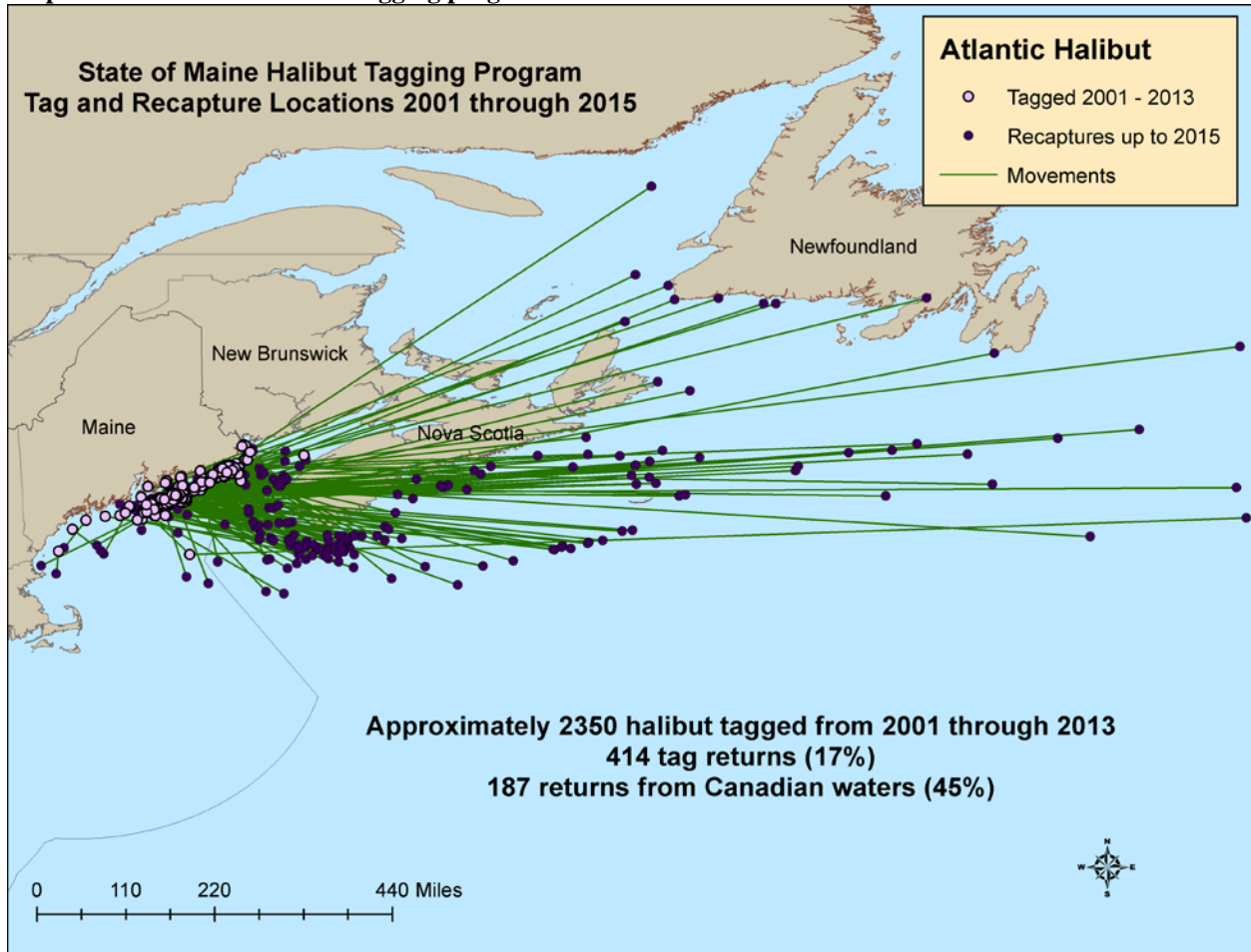
*2015 data is incomplete and subject to change

5. Maine Department of Marine Resources (ME DMR) Halibut Tagging Program

Halibut tagging was conducted in the State of Maine by one or more of the following groups since 2000 (Map 2):

- The federal experimental halibut fishery in 2000 - 2004
- The 2007 and 2008 DMR targeted longline survey
- The Maine/New Hampshire Inshore Trawl Survey, 2000 - 2013
- Maine Licensed Halibut Fishermen –2002 – 2012

Map 2- State of Maine halibut tagging program.



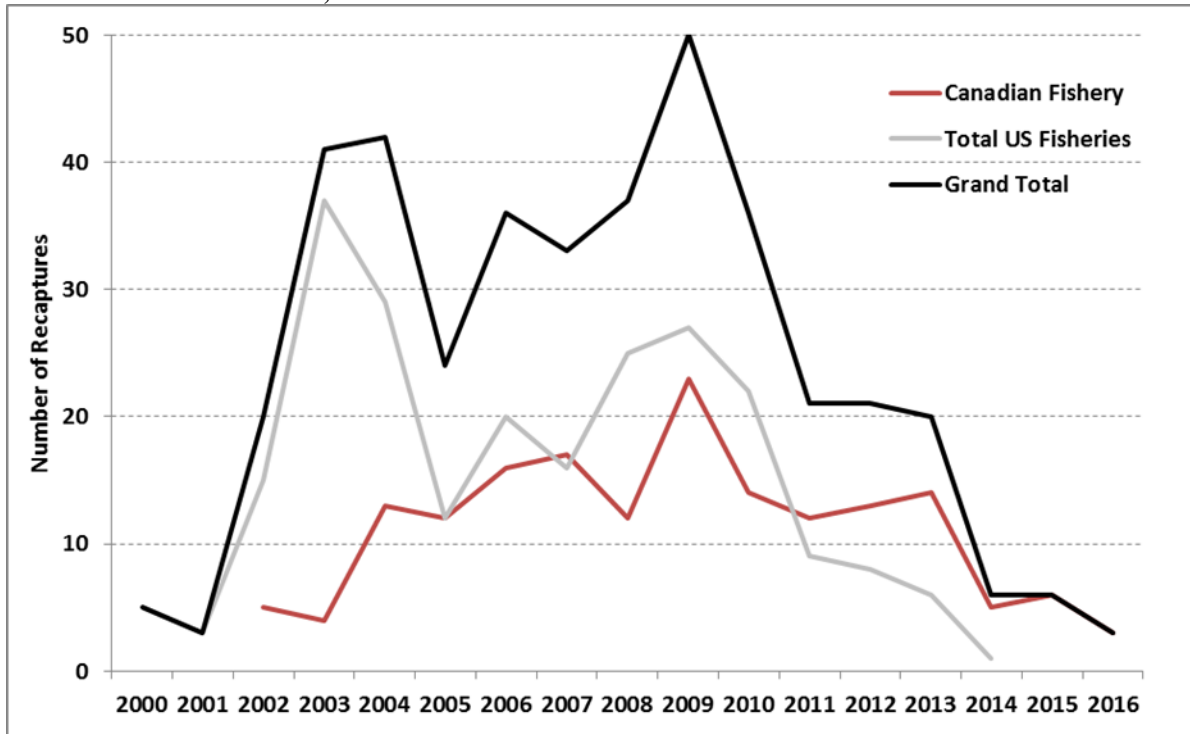
Initial findings:

- Days at liberty from a minimum of a few hours to 8.5 years
- Growth of 0 to 36 inches has been recorded.
- Distance traveled ranges from less than a nautical mile to more than 800 nm.

Figure 4 displays the number of halibut recaptures by year as total tag returns, returns from US fisheries, and returns from the Canadian fisheries. The experimental fishery was a large contributor to returns from 2000-2004, after that the largest portion of US tag returns are from the state waters longline fishery. The returns from Canadian waters increases starting in 2004

and accounts for nearly half of the total until 2011. In the last 4 years, the majority of tag returns have come from Canada.

Figure 4- Number of halibut recaptures by year as total tag returns, returns from US fisheries, and returns from the Canadian fisheries, 2000-2016.



Summary of Trawl Gear Workshop and Halibut Bycatch Reduction

Newport, Oregon

July 26- 28, 2016

Halibut Bycatch Reduction

1. Use of Halibut Excluder Grate with Escape Panels

- a. Overview: Conceptually similar to Nordmore grate or TED, the halibut excluder can be inserted prior to the codend opening, and after the belly of the net. This allows smaller fish to escape if they fit through grate, and larger halibut escape through an opening if they do not fit through the grate. Alterations can be made to accommodate vessel horsepower and size of net can be scaled accordingly. Tow speeds above 3.5 knots and slower than 2 knots can also help avoid halibut bycatch (fish can swim faster at slower tow speeds). However, sand dabs (windowpane flounder) are slow swimmers, and if encountered while towing at high speeds, the bycatch rate may increase. Kites and floats are used near grate to improve codend opening. Modifications to door and meshes at opening of net have been used to increase the diameter of fishing circle (for herding fish in particular), which improves catch efficiency. Refer to Figure 5 and Figure 6.
- b. Challenges: Halibut excluder nets increase vessel operational costs, and it would be important to conduct gear trials to test net efficiency at reducing halibut bycatch and maintaining similar catch rates for target species. Adding excluders to the fishing net may increase drag, and therefore increase fuel costs. For this reason, modifications to the net are made to increase water flow and help avoid grate clogging. Grate clogging is inevitable, but there are ways to reduce and mitigate fishing interruption when grate is clogged (e.g., skates). The excluder also increase contact with the seafloor due to siltation in codend and increase weight of net. In addition, the silt from habitat disturbance ends up in the gills of fish, which may reduce fish survival rates. In addition, quality of fish is reduced due to scaling damage from grate. This can be addressed by using PVC/plastic tubing around the grate.

2. Use of Camera System to Evaluate Net Efficiency in Halibut Bycatch Reduction and Target Species Retention

- a. Overview: Camera systems are also used to observe and analyze bycatch reduction rates before and after using an excluder device. Cameras are attached from a line going from the headrope with camera system and housing unit, into the belly of the net to the codend (different approaches have been used). Fishermen have used this to improve catch efficiency and avoid large bycatch events. For example, the real-time camera systems has been used to avoid halibut by interrupting the tow to avoid large concentrations of halibut entering the net, and raising the footrope from the bottom when fishing for flatfish.
- b. Challenges: The more expensive camera systems may cost \$100,000 to \$200,000 and can provide real-time video footage of fish entering the net from the wheelhouse (best system presented was SIMRAD technology – FX80 camera system). Low-end camera systems costs \$1,500 or more, if labor is done by fisherman. Contracting out

labor substantively increase costs. Low-end camera systems are not real-time, and can be as simple as a GoPro used within a housing unit, and attached to the gear.

Marine Stewardship Council (MSC) process and Bycatch Mitigation

- a. Overview: MSC is not prescriptive in how to improve MSC score (Refer to Figure 7). The management component to the certification process is used to assess whether the first and second component is working well, which includes: (1) health of the target stock; (2) impacts of fishing for that target stock on the ecosystem (e.g., benthic habitat).
- b. Challenges: Nearly 75% of the improvements to MSC score is due to need to collect additional information, which increases costs. Most responses to improved scoring have been mandatory reporting, followed by observer coverage change, followed by research projects. In the MSC assessment process, bycatch mitigation through fishery monitoring is a major factor currently used to improve bycatch rates, followed by impact assessment improvements.

3. Program funding for gear research and innovation technology

- a. Overview: Many of the research presented was funded through SK, BREP, EDF/ENGO. There is also a California Fisheries Fund by EDF
 - i. Details: \$350,000 with 6% interest rate and 2% lending fee, 10 year loans. Can use vessel quota as collateral; can also put money down. The lenders keep informed on changes in fishing regulations and have been flexible when regulations have led to fishery disruption (work with the industry to keep them on track with payments by modifying the loan terms).

4. Improved Gear Technology to Reduce Fuel Costs

Options to reduce fuel costs include:

- a. Increased door spread: Modify the meshes at the mouth of the net (can use fewer meshes if targeting fish that do not display schooling behavior).
- b. Several doors can improve aspect ratio to allow doors to stand more upright; thereby increasing the door spread. In addition, the shape of the door can be used to allow net to fish more efficient in complex habitat by reducing the likelihood that the doors will lay on side for any prolonged period of time.
- c. Plastic tubing around ground gear can reduce drag.
- d. Steel or rubber bobbins (6" to 8") can be used to replace rollers (works well for semi-pelagic fishing; likely less efficient when targeting flatfish). This reduces bottom contact, which has also been tested in studies to calculate reduction in trawl swept area (good for habitat protection as well). Use of bobbins have led to more positive review for Essential Fish Habitat consultations.

Trawl Gear Workshop Images

Figure 5 – Halibut Excluder Device, Presentation by Bill Hayes at Trawl Gear Workshop



Figure 6 – Halibut Excluder Device with Kites, Presentation by Bill Hayes at Trawl Gear Workshop

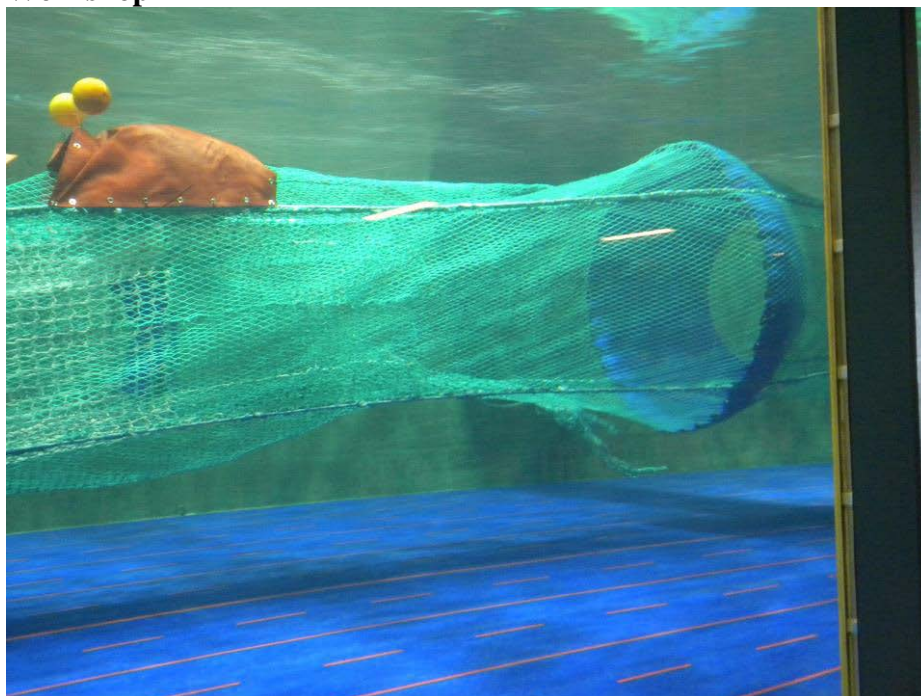


Figure 7 – Marine Stewardship Council on MSC Assessment Process, Presentation by Dan Averill at Trawl Gear Workshop

