

## 2015 Alaska Seafood Cooperative halibut mortality performance

In 2014, the State of Alaska proposed an emergency action to increase the 2015 FCEY in the Area 4CDE halibut fishery. The action was proposed to support a 1 million net pound directed fishery for that area. The Alaska Seafood Cooperative (AKSC) considered the magnitude of halibut mortality reduction needed to achieve this catch limit, and set itself a goal of reducing its halibut usage by 217 mt from its 2014 halibut usage. This amount is the cooperative's proportional share of the reduction in overall halibut usage needed to support the 1 million net pound 4CDE directed fishery. This reduction is equivalent to the cooperative adopting a goal of maintaining halibut usage at or below 1,101 mt in Area 4CDE for 2015. In addition, the cooperative also set a goal of maintaining Area 4A and 4B catches at or below their historical levels. The following table briefly summarizes the calculations that define the goal.

### Area 4CDE halibut mortality reduction and goal to reach a 1 million net pound fishery in Area 4CDE

Total 2014 - 4CDE halibut bycatch mortality	2,753
AKSC 2014 - 4CDE halibut bycatch mortality	1,319
AKSC share of halibut mortality in Area 4CDE	47.9%
Total mortality savings for 1 million pound 4CDE halibut fishery	454
<b>AKSC share of 4CDE reduction based on usage</b>	<b>217</b>

AKSC monitors its vessels' halibut bycatch continuously. Seastate alarms are used to track high bycatch as soon as it is recorded. AKSC also prepares fleet reports twice a week to ensure that all cooperative members are aware of overall performance and changes in conditions. Throughout the year, the cooperative compared its groundfish catch and halibut usage to prior years to gauge its performance relative to the Area 4CDE goal and for examining halibut usage overall. Although rates have fluctuated, at all times, AKSC has been on track to meet the 1,101 mt Area 4CDE target.

In addition to attaining its Area 4CDE goal, the cooperative has also been successful in maintaining its halibut usage in Areas 4A and 4B well below their historical averages. In setting its halibut goals for the year, the cooperative not only set an Area 4CDE goal, but also set a goal of not increasing its halibut usage in Areas 4A and 4B beyond their historical averages. To date, the cooperative's 2015 use of halibut in Areas 4A and 4B has been 119 mt compared to the 326 mt that the cooperative averaged from 2008 to 2014.

The following table shows 2015 AKSC halibut use in the Bering Sea and Aleutian Islands by halibut management area through November 30:

Area	Year	Halibut mortality (mt)	Target maximum usage	Target maximum usage remaining	Percentage of target maximum usage remaining
4CDE	2014	1,319	-	-	-
	2015	1,056	1,101	45	4%

As the year end has approached, we have monitored our performance more closely, setting internal rate goals and monthly usage goals based on historical trends to improve the chances of reaching the goal. During the fourth quarter, target species tend to disaggregate, and halibut tend to move into the fishing grounds. With these changes, added attention to performance is appropriate to ensure that the fleet attains the bycatch reduction goal. The cooperative benefited from unusually good weather and low halibut bycatch rates throughout October. Storms in November dispersed schools of yellowfin, making halibut avoidance more challenging. Despite these challenges, this year the cooperative has maintained its best fourth quarter halibut rates since its formation. Most of the cooperative's vessels have finished fishing reducing the potential for any excessive spikes, if conditions change.

Year	October			November			December			4 <sup>th</sup> quarter total		
	Groundfish (mt)	Halibut mortality (mt)	Rate (kg/mt)	Groundfish (mt)	Halibut mortality (mt)	Rate (kg/mt)	Groundfish (mt)	Halibut mortality (mt)	Rate (kg/mt)	Groundfish (mt)	Halibut mortality (mt)	Rate (kg/mt)
2008	23,092	193	8.4	6,776	120	17.7	1,187	3	2.6	31,054	316	10.2
2009	17,258	257	14.9	2,690	304	113.0	0	0	0.0	19,948	292	14.6
2010	16,960	169	10.0	6,487	92	14.2	420	25	59.5	23,867	286	12.0
2011	18,769	106	5.7	6,180	64	10.4	468	16	33.7	25,147	184	7.3
2012	16,574	169	10.2	6,329	111	17.5	1,090	14	12.5	23,993	293	12.2
2013	19,309	146	7.6	6,514	112	17.2	3,668	41	11.1	29,492	299	10.1
2014	15,677	88	5.6	10,880	81	7.4	4,608	43	9.4	31,165	212	6.8
2015	17,291	67	3.9	9,554	74	7.8	*	*	*	26,844*	141.2*	5.3*

\* No data are available for December 2015 at the time of this report. Fourth quarter numbers for 2015 exclude any December catches.

### Halibut bycatch reduction tools utilized during 2015

AKSC utilized a suite of bycatch tools to reduce halibut mortality, most of which are described in the attached rules of the road document and were presented to the Council at both its February and June meetings. Cooperative members were able to minimize halibut usage through a variety of halibut avoidance measures, including choices of fishing location and time of day, excluders, and deck sorting. Principal to these halibut avoidance measures was active communication among captains on the grounds. The effectiveness of the various halibut avoidance measures changes with fishery conditions. On the grounds communications kept captains well-informed of successful PSC avoidance strategies allowing them to cope with the continuously changing conditions and effectiveness of the various halibut avoidance tools.

The cooperative supplemented these on the grounds communications with weekly meetings of company representatives and vessels captains. The review of weekly halibut performance reports led to discussion of the conditions on the grounds, and the effectiveness of halibut avoidance measures. The meetings typically covered halibut mortality rates, target species, excluder effectiveness, halibut movement, fishing depths, and bottom temperatures in the areas being fished by cooperative members. The cooperative distributed summaries of the meeting discussions to all members (including those unable to attend) on the day of the meeting.

Cooperative staff and company managers monitored individual vessel halibut performance through Seastate. Monitoring is conducted through regular checks on overall cooperative, as well as company and vessel, performance. In addition, the Seastate alarm system is used, which will notify a user when a user-defined rate or catch threshold is exceeded in a defined period (such as a tow or day). Alarms can be programed to include a map that shows tow location, halibut rate, halibut mortality, target species,

and other information that can be useful for assisting with the halibut avoidance efforts of vessels and the cooperative, as a whole.

During the season, vessels experimented with new designs of excluders and tuned existing designs with a variety of modifications. These modifications improved excluder effectiveness by increasing the exclusion of halibut and decreasing loss of target catch. For example, captains reported incorporating “kites”, typically comprised of panels of canvas tied into sections of the mesh designed to lift out and slow down the flow at the aft section of the excluder device. With the addition of kites, target species were better able to swim through the inner panels of the excluder and into the codend reducing loss of target species catch. These improvements allowed vessels to use excluders with lower loss of target fish and avoiding the need to tow longer. With a more effective excluder, fishermen were also able to expand their use of excluders into new fisheries, as the effectiveness of excluders increased halibut avoidance in a larger range of conditions and fisheries. Excluder effectiveness varies across fisheries and vessels with both conditions, vessel and net characteristics, and operating practices. As a result, individual experimentation with operations and configuration is needed to get the greatest return from an excluder. Vessels anticipate continuing excluder development in the coming year and additional modifications will be made to further reduce losses of target catch.

### **Deck sorting to reduce halibut mortality in 2015**

Vessels participating in the 2015 halibut deck sorting EFP were able to achieve significant mortality savings. The 2015 EFP expanded on earlier work by conducting the EFP in a wider range of flatfish fisheries than in earlier EFP tests. Specifically, a large amount of EFP activity occurred in the yellowfin sole fishery on both small and the large vessels. Yellowfin is the most significant flatfish fishery by catch volume, vessel participation, and annual total value. Because of the high catch volume and low halibut rates in the fishery, deck sorting was generally expected to be unworkable. This year, however, vessels sorted as many halibut as possible within 20 minutes or less, which resulted in significant halibut savings in yellowfin target fishery relative to the standard mortality rate applied in the fishery of 83 percent.

Nine of the fourteen active AKSC vessels this year participated in the deck sorting EFP at one point or another. All but one of the vessels achieved mortality rates in the range of 41 percent to 53 percent. The table below shows EFP performance by vessel through November 16<sup>th</sup>. Halibut savings under the EFP is estimated by comparing the EFP mortality with an average flatfish mortality rate in all flatfish fisheries of 80 percent – the rate that would have occurred under normal fish handling procedures without deck sorting.

One EFP participant had somewhat higher halibut mortality rates. The vessel’s deck layout, factory capacity, and stern tank size all limited the ability of the vessel to adopt the necessary modified catch handling procedures. These limitations allowed the vessel to sort halibut from only a relatively small fraction of each haul. In spite of this, the vessel was still able to reduce mortality rates relative to the standard rates in the flatfish fisheries. Accordingly, the vessel only made seven EFP tows in 2015. Modifications are probably needed to achieve success similar to the other EFP vessels.

Vessel	Groundfish (mt)	Halibut catch (mt)	EFP mortality (mt)	EFP mortality rate	IPHC mortality (mt)*	Net Savings (mt)	Dates in EFP
Constellation	7,671	116.9	58.5	50%	93.5	35	May 24-July 4; July 17-Oct 24
Legacy	794	22.2	9.1	41%	17.8	8.7	May 16 -June 4
Arica	10,925	136.6	65.9	48%	109.3	43.4	June 9- Nov 16
Cape Horn	5,586	74.2	34.3	46%	59.4	25.1	June 3- July 26; Sept 14-Nov 6
Rebecca Irene	921	14.9	6.4	43%	11.9	5.5	July 20-Sept 2
Defender	5,153	65.4	34.2	52%	52.3	18.1	June 22-Oct 16
Unimak	3,656	21.8	10.9	50%	17.4	6.5	Aug 29-Oct 11
Ocean Peace	1,293	25.3	11.8	47%	20.2	8.4	Aug 12-Sept 2
Enterprise	159	0.2	0.1	70%	0.2	0	Sept 17-Sept 19
<b>Total</b>	<b>36,158</b>	<b>477.5</b>	<b>231.3</b>	<b>48%</b>	<b>382</b>	<b>150.8</b>	

\* Mortality at the average default rate in flatfish fisheries of 80 percent.

Based on experience from the 2015 and previous deck sorting EFPs, deck sorting has the potential to allow for significant halibut mortality savings. However, several significant administrative barriers need to be resolved prior to regulatory implementation. These include development of a monitoring and catch accounting program that is cost effective, pragmatic, provides high quality management data, and provides the necessary incentives for careful handling. AKSC is in the process of applying for a 2016 EFP which includes the option of participation of the Alaska Groundfish Cooperative, CDQ, and CP vessels operating in the TLAS program. The design of the 2016 EFP should address many of these remaining issues associated with implementation and we hope to have a regulatory program available for all non-pelagic catcher-processor trawl vessels in 2017.

### Operational impacts of halibut bycatch reduction efforts

Efforts to reduce halibut mortality have come with substantial impacts to vessel operations that ultimately reduce efficiency and increase operating costs. For example, increased use of excluders not only reduced target catch but also increased drag and fuel consumption. Test tows used to determine halibut bycatch rates in an area and smaller tows used to allow for improved survival of deck sorted halibut also increase fishing time and fuel consumption. When higher rates of halibut were encountered, transit necessary to avoid halibut increases fuel consumption and increases trip length, ultimately reducing fishing time and fishery harvest.

These operational impacts can be quantified by comparing this year's catches in flatfish targets with prior years under the Amendment 80 program. The following table shows AKSC flatfish and halibut catches and tow information through from 2008 through 2014 on average and in 2015. This year's flatfish catches are the lowest since implementation of Amendment 80. This amount is a reduction of almost 17 percent from the average from 2008 to 2014. While some of this reduction was made up in other fisheries that have lower halibut bycatch rates, such as Atka mackerel and Pacific ocean perch, these losses in catch and the ability to mitigate losses are not equally distributed throughout the cooperative. Some companies had little ability to mitigate losses by increasing participation in other fisheries.

These increases in operational impacts are reflected in the number of tows and small tows (defined here as less than 10 mt) that vessels took in 2015. The total number of tows taken by vessels in the cooperative increased almost 30 percent from an average of approximately 3,100 tows from 2008 to 2014 to over 4,000 tows. The number of small tows increased by over 72 percent from the historical average to over 728 tows. These smaller tows can be used to determine the halibut bycatch rate before an area is more extensively fished, and to improve mortality in deck sorted tows. The ability to effectively deck sort a larger tow will largely depend on both vessel characteristics, target catch rate, and halibut bycatch rate.

Year	Pacific Halibut use (mt)	Flatfish catch (mt)	Number of tows	Number of tows under 10 mt
Average (2008-2014)	1,381	163,157	3,122	422
2015	1,099	135,507	4,020	728
Difference	-282	-27,650	898	306
Percent difference	-20.4	-16.9	28.8	72.4

Decreased target catches can be attributed to several factors. Excluders decrease target catches, at times by as much as 50 percent. Small tows also increase the time needed to catch target species. Together, these factors have led to a decline in overall flatfish harvests. The impacts of reduced flatfish harvest, increased fuel consumption, and direct costs of deck sorting have yet to be quantified, however it is clear that the operational impacts and increased inefficiency of the fleet are significant.

## Appendix

### **Alaska Seafood Cooperative Halibut Bycatch Rules for 2015**

In order reduce bycatch to allow for a substantial increase in the directed halibut fishery catch limit in Area 4CDE from the IPHC staff's preliminary blue line advice, the members of the Alaska Seafood Cooperative (AKSC) agree to the following terms:

**Notice of entry to/exit from the BSAI fisheries** - Each vessel will notify both Seastate and the other fishery participants on entry to or exit from the Bering Sea and Aleutian Islands fisheries to facilitate communication.

**On grounds communication among captains** – Captains will communicate on the grounds concerning halibut bycatch rates. On grounds communication provides the most up to date and complete information concerning halibut avoidance – includes discussions of:

- 1) prevailing bycatch rates and changes in those rates,
- 2) catch rates of O26 halibut (particularly in the 4CDE accounting area),
- 3) effectiveness of deck sorting in the different target fisheries under various conditions and bycatch levels,
- 4) effectiveness of excluders in the different target fisheries under various conditions and bycatch levels, and
- 5) any factor that may be relevant to bycatch rates and O26 bycatch rates, including the effects on halibut rates and O26 halibut rates of:
  - a. time of day
  - b. fishing depth
  - c. water temperature
  - d. areas of halibut concentrations
  - e. excluder performance (including type and mesh size)
  - f. effects of any gear modifications.

**Test tows** – When appropriate, vessels will use smaller test tows to ensure that halibut rate is acceptable prior to fishing an area.

**Attention to Haul Composition** –Wheelhouse personnel will give increased attention to haul composition by watching the bag dump and assessing the halibut bycatch rate and halibut O26 bycatch rate and to increase communication with deck crew concerning halibut bycatch (and halibut O26 bycatch) trends.

**Excluder Use** – The use of excluders is encouraged. Since excluders may have limited benefits (and sometimes increase bycatch) in the high volume, low bycatch periods, vessels are also encouraged to share information concerning the effectiveness of excluders when fishing different areas and under different conditions.

**Seastate Reporting** – Seastate is commissioned to develop bycatch charts on a regular basis that display the halibut bycatch rates (including O26 bycatch rates) in the fisheries. These charts will show halibut bycatch (including O26 bycatch) by target fishery.

**Decksorting** - On approval of the cooperative's 2015 decksorting Exempted Fishing Permit, vessels are encouraged to use decksorting to reduce mortality of halibut (particularly O26 halibut in the 4CDE accounting area).

**Night Towing** – Night towing is discouraged in fisheries with historically higher night halibut bycatch rates. Cooperative members are directed to give extra attention to halibut bycatch rates (and 4CDE O26 halibut bycatch) if fishing at night. If a vessel cannot achieve night fishing bycatch rates that are measurably similar to day fishing bycatch rates, the vessel is strongly encouraged to end night fishing.

**Rate Standard** — As fishing progresses during the season, cooperative members will consider whether any halibut rate standards may be beneficial for achieving halibut bycatch reductions. Rate standards could be applied at the target fishery level to compel certain avoidance measures, if appropriate rate levels and monitoring requirements and effective response measures can be identified.

**Weekly meetings** – Cooperative members agree to meet weekly to discuss overall Bering Sea halibut PSC performance and 4CDE accounting area O26 halibut bycatch performance. Meetings will include discussions of:

- 1) Prevailing halibut bycatch rates and performance (and particularly 4CDE accounting area O26 rates and performance).
- 2) Success of the various bycatch avoidance strategies identified in this agreement and the effects of any other strategy or factor on bycatch avoidance and rates
- 3) Development of additional measures to reduce bycatch, including whether sufficient information exists to develop any new or additional bycatch avoidance requirements or practices to supplement those identified in this agreement
- 4) Possible performance standards and responses required for those vessels not meeting the standards.