

Amendment 80 Halibut Avoidance Plan
Alaska Seafood Cooperative and Alaska Groundfish Cooperative
Report to the North Pacific Fishery Management Council
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At its June 2015 meeting, the Council requested that the Amendment 80 participants develop a plan for halibut avoidance. In response, Alaska Seafood Cooperative and Alaska Groundfish Cooperative (the cooperatives) developed best practices to support fleet communication, excluder use, and other fishing practices that aid in halibut avoidance. In addition, sector members agreed to performance standards to incentivize all vessels in the fleet to stay below maximum halibut rates (kilograms of halibut mortality per metric ton of groundfish) in the designated target fisheries. The plan is intended to ensure that no vessels are outliers with unacceptably high halibut bycatch rates annually using both annual and quarterly performance standards. The plan also establishes a maximum halibut rate standard for the fourth quarter when halibut rates have historically increased to the highest levels in the year. Vessels that fail to stay below the set rates are penalized, with penalties increasing with both the vessel's halibut rate and groundfish harvest. This paper provides a brief description of the plan, as well as the performance of the sector's vessels under the plan in its first year.

Description of the plan

The sector's halibut avoidance plan is comprised of three tests. Two of the tests provide incentives for maintaining acceptable halibut avoidance on an annual basis. The third test provides incentives for maintaining halibut avoidance techniques into the fourth quarter, when halibut rates historically have risen.

- Annual Outlier Test - Tier 1: Individual vessels are required to meet annual halibut rate standards for three species/species group target fisheries – yellowfin sole, rock sole, and flathead sole/arrowtooth flounder. The annual standards become more stringent over time to incorporate learning and increased ability of vessels to achieve halibut avoidance goals. Vessels that fail to meet the applicable rate standard are subject to monetary penalties.
- Fourth Quarter Test: To curtail the potential for halibut rates to increase in the fourth quarter, all vessels are subject to a fourth quarter rate standard. Vessels that fail to meet the rate standard are subject to monetary penalties.
- Quarterly Outlier Test - Tier 2: Any vessel that does not meet the annual standard in a target fishery will be subject to quarterly monitoring the following year, in addition to the annual monitoring and fourth quarter monitoring that apply to all vessels. Vessels that fail to meet the applicable standard in any quarter would be subject to halibut forfeitures.

Annual Outlier Test - Tier 1

The Annual Outlier Test (Tier 1) requires each vessel to meet halibut rate standards annually in three different target fisheries. The outlier test is similar to the Vessel Incentive Program (VIP), which was abandoned by the Council due, in part, to NMFS enforceability concerns. The inter-cooperative agreement provides a structure for internally implementing and enforcing these standards without regulation.

The yellowfin sole, rock sole, flathead sole, and arrowtooth flounder targets represent 88 percent of the halibut mortality from 2012-2014; therefore, these target fisheries provide the greatest opportunity for halibut mortality savings. Maintaining halibut mortality rates in these targets at low, yet practicable, levels allows the fleet to minimize halibut use to the extent practicable.

The plan sets rate standards in three different target fisheries based on historical performance. Yellowfin sole and rock sole will each be monitored independently because these fisheries occur in different areas at different times of year. Arrowtooth flounder and flathead sole occur in similar fishing locations, times, and conditions and are therefore aggregated as a target under the plan.

Under the program, rates are based on the 2012-2014 average halibut rates for each of the targets. These years represent the most recent three-year average, and are most representative of current ocean and fishing conditions, as well as the state of halibut avoidance in the sector. Similar to the VIP, the average halibut rate for each target species is multiplied by a “multiplier” to establish the standard recognizing that a portion of the fleet exceeds the average by definition. The VIP multiplier was 2.0, and is the starting point for yellowfin sole and rock sole targets in 2016. To bring outlier vessels closer to the fleet average, the multiplier in these target fisheries will be reduced to 1.75 in 2017 and 1.5 in 2018 and subsequent years. Lowering limits in the second and third years of the program is intended to provide time for outlier vessels to adjust their bycatch avoidance practices to these more restrictive standards. Additionally, these rate reductions coincide with a potential implementation schedule for deck sorting, one of the bycatch reduction tools intended to aid vessels in achieving the standard.

The arrowtooth flounder/flathead sole combined target is subject to a 1.8 multiplier in 2016, which is reduced to 1.65 in 2017, and 1.5 in 2018 and thereafter. The more stringent starting point for these targets recognizes the need to achieve reductions more quickly in these fisheries, which have historically experienced higher halibut mortality rates. The rate reductions will have the effect of making scaled mortality reductions on outlier vessels, as well as reducing halibut mortality overall in these fisheries.

Rates standards based on the fleet mean 2012-2014 rate with a decreasing multiplier.

Species	2012-2014 Base Rate (kg/mt)	Year	Multiplier	Rate Standard (kg/mt)
Yellowfin sole	5.8	2016	2	11.7
		2017	1.75	10.2
		2018	1.5	8.7
Rock sole	7.2	2016	2	14.3
		2017	1.75	12.6
		2018	1.5	10.8
Flathead sole/ Arrowtooth flounder	11.7	2016	1.8	21
		2017	1.65	19.2
		2018	1.5	17.5

The test is applied by comparing a vessel’s halibut rate in a target fishery to the applicable annual standard at the end of the year. A vessel’s rate will be based on its target catches in Amendment 80 and CDQ fisheries combined. Including CDQ catch will prevent vessels from attributing catch to one management program or the other based on the potential for a violation under the program. Vessels that exceed the applicable rate standard will be subject to a monetary penalty as described below.

Minimum groundfish thresholds for test

To avoid the potential for discouraging a vessel with unacceptably high halibut rates from exiting a fishery, vessels that have minimal groundfish catch in a target will be excluded from the program. Specifically, if a vessel enters a fishery and finds unacceptably high halibut rates, applying a penalty at low harvest amounts would create an incentive for the vessel to remain in the fishery hoping to find cleaner fishing to lower its rate.

Vessels have occasionally had very little catch in one of the targets, at times with relatively high halibut rates. Departure of these vessels from the fishery saved halibut and should not be discouraged. To avoid the creation of a disincentive for leaving a fishery with high halibut bycatch rates, vessels below a threshold catch amount in a target are not subject to the rate test. Thresholds for the targets are 1,000 mt in yellowfin sole, 1,000 in rock sole, and 500 mt in arrowtooth/flathead. These catch thresholds should be adequate to ensure that a vessel has no incentive to remain in a fishery in an attempt to avoid a penalty.

Penalties

Vessels that do not pass the annual outlier test for a given target species will be subject to a monetary penalty. Fines are on a target basis, so a vessel will be subject to a penalty in each target in which it fails to meet the applicable standard. Fines for each target range from a minimum of \$50,000 to a maximum of \$100,000 based on the vessel's halibut rate and the amount of groundfish harvested. Having the penalty increase with groundfish harvests creates a disincentive for continuing harvests at the unacceptably high rate. Vessels that do not meet the annual standard will also be subject to additional scrutiny in the following year by being subject to quarterly monitoring.

Fourth Quarter Test

Among the concerns addressed by this plan is the historical rise halibut rates in the fourth quarter. The rise is likely attributable to several factors, including dispersion of target fish on the grounds, halibut abundance and distribution, and incentives for halibut avoidance. The fourth quarter test increases the incentive for halibut avoidance during the latter part of the year. Vessels with excess halibut at the end of the year have an increased incentive for reducing their halibut and leaving unused halibut in the water.

Under the fourth quarter monitoring plan, vessels must maintain halibut rates at or below a threshold level in the three flatfish targets included in the program. Although the large majority of groundfish catch and halibut bycatch in the fourth quarter is from the yellowfin sole target, full accountability for halibut bycatch is better achieved by a more comprehensive program that also includes the rock sole and arrowtooth flounder/flathead sole targets.

The rate standard is set at the fourth quarter 2012-2014 fleet average halibut rate in the aggregated flatfish targets. Recognizing that halibut rates have historically been highest in the fourth quarter, no multiplier is applied to the historical rate. This results in a rate standard of 12.1 kilograms of halibut per metric ton of groundfish harvest. By simply requiring all vessels to stay below the historical fleet average, the fleet's overall rate will be reduced from historical levels.

The test is applied by comparing each vessel's individual halibut mortality rate for aggregated yellowfin sole, rock sole, arrowtooth flounder, and flathead sole targets for the fourth quarter with the rate standard. Vessels that are above the test rate are considered outliers and are subject to a monetary penalty.

Minimum groundfish and halibut thresholds for test

If a vessel has engaged in substantial fishing in the fourth quarter and finds that halibut rates are increasing to an unacceptable level, the penalties imposed by the fourth quarter program will create an incentive for this vessel to depart the fishery to avoid exceeding the rate standard. On the other hand, a vessel just beginning to fish in the fourth quarter that immediately realizes poor halibut rates could also

wish to leave the fishery, but if facing penalties, the vessel would have an incentive to remain in the fishery in an attempt to reduce its rate and avoid the penalty. To remove that incentive, the fourth quarter program exempts any vessel from the penalties that has minimal catch (defined as less than 750 mt). This catch threshold is intended to strike a reasonable balance, allowing a vessel a reasonable opportunity to find acceptably clean fishing, but not creating an incentive for a vessel to remain in the fishery for an extended period, if acceptable fishing cannot be found.

The program also recognizes that a vessel's quarterly halibut catch, in and of itself, could reach an unacceptable level, regardless of the amount of target catch of the vessel. To prevent a vessel from taking an excessive amount of halibut a 20 mt threshold will be applied, after which the penalty system will apply to the vessel, regardless of whether the 750 mt threshold is reached. This threshold creates an incentive for a vessel with unacceptably high halibut mortality to discontinuing fishing, regardless of whether it approaches the 750 mt catch threshold.

Together the combination of a groundfish threshold and a halibut threshold in the fourth quarter create an incentive for vessels with unacceptably high halibut rates to depart the fishery quickly to avoid possible penalties.

Monetary penalties

Vessels that do not meet the fourth quarter rate standard in the aggregated flatfish targets will be subject to a fine. Fines range from a minimum of \$25,000 to a maximum of \$50,000, and are in addition to any annual fine assessed. Fines increase with both the halibut rate of the vessel and the amount of groundfish catch by the vessel. Increasing penalties with groundfish catch create an incentive for a vessel to stop fishing, if it is unable to improve its rates.

Quarterly Outlier Test - Tier 2

The quarterly outlier program provides additional scrutiny of vessels that fail to meet an annual halibut rate standard. The additional scrutiny is intended to increase the incentive for non-performing vessels to meet acceptable rate standards in the subsequent year. A vessel is subject to the quarterly monitoring program for any targets for which it failed the annual rate test the preceding year. Quarterly monitoring is in addition to the other monitoring under the plan. All vessels (including those subject to quarterly monitoring) will be subject to both the annual monitoring and the fourth quarter monitoring.

The quarterly rate standard for the first three quarters will be the same as the annual rate standard applicable in that calendar year. For example, a vessel that is subject to quarterly monitoring in a target would be subject to quarterly monitoring in the target at the annual rate standard for that target for the first three quarters of the year.

In the fourth quarter, vessels subject to quarterly monitoring will be required to meet the fourth quarter test rate that applies to all flatfish targets. Given the lack of substantial fishing in the rock sole and arrowtooth/flathead targets and the relatively higher rates in the quarter, applying the aggregated fourth quarter standard will induce the desired level of halibut avoidance across all targets. Vessels that are subject to quarterly monitoring have an additional incentive to maintain low halibut bycatch rates. Vessels under quarterly monitoring are subject to two penalties for failing to meet the fourth quarter rate, a halibut penalty under the quarterly plan (as described below) and a monetary penalty under the fourth quarter monitoring plan. This added incentive ensures that these vessels fish at an acceptable annual rate.

Minimum groundfish and halibut thresholds for test

As with the other tests under the program, quarterly monitoring should not be structured in a manner that discourages a vessel fishing from exiting a fishery because it is finding unacceptable halibut rates. Therefore, the quarterly rate standards are not applied to vessels that have not reached a threshold catch

amount. For the first three quarters the catch threshold would be the same as the annual catch threshold in the applicable target fishery (i.e., 1,000 metric tons in the yellowfin sole and rock sole target fisheries and 500 metric tons in the arrowtooth flounder/flathead sole target fishery). In the fourth quarter, the threshold catch amount is 750 metric tons, which is the same threshold used in the fourth quarter test.

As in the fourth quarter test, the quarterly test recognizes that a vessel's quarterly halibut catch, in and of itself, could reach an unacceptable level, regardless of the amount of target catch of the vessel. To prevent a vessel from taking an excessive amount of halibut, a 20 metric ton threshold will be applied in each quarter. If that threshold is exceeded the penalty system will apply to the vessel, regardless of whether the applicable catch threshold is reached. The catch and halibut thresholds together create an incentive for vessels with unacceptably high halibut catch or rates to depart the fishery quickly to avoid possible penalties.

Halibut penalties

A vessel that fails to meet the quarterly rate standard will be subject to a halibut penalty equal to the additional halibut that the vessel used as a result of exceeding the target rate. This amount is calculated as the difference between the vessel's actual halibut use and the use that the vessel would have achieved had it met the applicable rate standard. In other words, the vessel's halibut use in the quarter minus the vessel's groundfish catch in that quarter times the applicable rate standard.

Retrospective analysis of the program

In developing the program, the sector undertook a retrospective analysis of the potential effect of the program to assess its potential effect. This analysis applied the various standards to prior years' fishing to ensure that behavior modification would be driven by the plan.

Annual outlier test

The annual outlier test is intended to create a strong incentive for each vessel to maintain a reasonable halibut mortality rate in the fisheries prone to halibut bycatch – yellowfin sole, rock sole, and arrowtooth flounder/flathead sole. This incentive is driven by a fine that is applied to each vessel that fails to meet an acceptable annual mortality rate (in kg of halibut mortality per metric ton of groundfish catch). Mortality test rates decline over a three year period to one and one-half the fleet average mortality from 2012 to 2014. The decreasing rate standards provide vessels that would currently be non-compliant with an opportunity to develop halibut avoidance proficiency.

The table below shows the annual fines that would have been applied had the program been in place from 2008 to 2015 (through December 1, 2015). Fines are shown for each defined target and in the aggregate in the last row of the table.

Fines in the fisheries follow no particular pattern when compared to overall fleet performance. In a few cases, more fines are imposed in years of relatively high mortality rates; however, in some years of low mortality rates, both the number of vessels subject to fines and the amount of fines are large. Such a result suggests that the test will be useful for identifying outlier vessels, rather than just fining vessels when halibut mortality rates are relatively high overall. The final table shows aggregate projected annual fines under the test. The table shows that fines would have which averaged over \$250,000 annually under the rate standards applied in 2016. The highest fines in a given year would have reached almost \$500,000.

Projected annual fines by target under the annual outlier test (2008-2015).

Target	Year	Number of vessels	Number of vessels fined	Fine amounts (\$)
Yellowfin sole	Average	19	2	103,750
	Maximum	21	4	260,000
Rocksole	Average	19	1	88,125
	Maximum	21	3	235,000
Arrowtooth flounder /flathead sole	Average	17	1	70,000
	Maximum	18	4	320,000
Total	Average	55	4	261,875
	Maximum	59	6	460,000

Note: total vessel counts includes double counting of vessels in multiple targets.

Effects of the fourth quarter test

In the fourth quarter, all vessels are subject to a rate standard equal to the mean rate in the fourth quarter from 2012 through 2014. Vessels that fail to meet the standard are subject to a penalty of approximately one half of the annual penalty. The rate standard is applied to all flatfish targets monitored under the program (i.e., yellowfin sole, rock sole, arrowtooth flounder/flathead sole in the aggregate). Yellowfin sole is the primary target in the fourth quarter; however, all targets are included to ensure that vessels cannot avoid the program through target selection.

The table below shows a retrospective analysis of the fourth quarter test from 2008 through 2015. The test shows that fines would have averaged almost \$150,000 annually, with 5 vessels failing to meet the rate standard on average. At most 10 vessels would have been fined for exceeding the standard and over \$320,000 would have been paid by substandard vessels in one year.

Projected annual fines under the fourth quarter test (2008-2015).

	Number of vessels	Number of fined vessels	Fine amounts (\$)
average	15	5	142,500
maximum	18	10	320,000

In considering these results, it is important to keep in mind that the objective of the avoidance plan is not to collect fines, but to change incentives in a manner that induces all vessels to meet the rate standards. In other words, success should be measured not in the amount of money paid in fines, but rather by the absence of fines. The retrospective analysis provides a reasonable baseline for assessing future performance. Fewer fines than those suggested by the retrospective analysis suggest that changes in halibut mortality rates intended to arise from the program have occurred.

Performance in the 2016 season

In the 2016 season, no vessels fished at halibut rates that led to penalties under either the annual standard or the fourth quarter standard.

Annual participation in the yellowfin sole and rock sole targets were similar to participation levels in the historical period, with 19 and 18 vessels participating in those fisheries respectively. One vessel in each fishery failed to meet the minimum groundfish threshold needed for the standard to apply. Only 14 vessels participated in the arrowtooth flounder and flathead sole target fisheries, down from an average of 17 vessels in the historical period, with only 8 vessels reaching the minimum groundfish thresholds. Those fisheries tended to draw fewer vessels historically than yellowfin sole and rock sole target fisheries.

All vessels that reached the minimum groundfish threshold achieved halibut rates below the applicable 2016 rate standard. One vessel in the yellowfin sole fishery exceeded the 2017 standard. That vessel would need to further reduce its halibut rate to avoid being penalized in 2017. One vessel with very little catch in the arrowtooth/flathead target did not meet the groundfish threshold in that target and exceeded the rate standard. No other vessels that were below groundfish thresholds exceeded the rate standard.

Annual outlier test results for 2016.

Target	Number of vessels in the fishery	Number of vessels meeting the minimum groundfish threshold	Number of vessels meeting the 2016 standard	Number of vessels meeting the 2017 threshold
Yellowfin sole	19	18	18	17
Rock sole	18	17	17	17
Arrowtooth and flathead (combined)	14	8	8	8

In the fourth quarter, 17 vessels fished in the flatfish targets included in the program. Of those vessels, 14 met the minimum groundfish threshold, with all of those vessels meeting the halibut rate standard. The number of vessels fishing in the targets is slightly higher than historical numbers, but performance in 2016 was substantially better than historical performance, as prior to 2016 5 vessels on average exceeded the rate standard annually.

Fourth quarter outlier results for 2016

Number of vessels in yellowfin, rock sole, and flathead/arrowtooth targets	17
Number of vessels meeting the minimum groundfish threshold	14
Number of vessels meeting the 4th quarter standard	14

Conclusion

Historically, some vessels in the Amendment 80 sector were outliers, maintaining halibut bycatch rates substantially higher than the rest of the fleet. The annual outlier test and its accompanying penalties are intended to induce those vessels to reduce rates to acceptable level given the historical fleet average. In the first year of the program, the absence of penalties charges (in comparison to the historical fishing) demonstrates the success of the program in bringing outlier vessels closer to the fleet average. With additional reductions in the standard, historical outlier vessels will be subject to a greater incentive to maintain rates at lower levels. The fourth quarter rate test is intended to result in all vessels achieving

rates below the fleet's historical average fourth quarter rates. In the first year, this goal was achieved by all vessels in the fisheries.

The halibut avoidance plan and its associated standards and penalties have become an integral part the inseason management of halibut in the Amendment 80 sector. Each company receives a weekly report showing the performance of each of its vessels relative to the applicable standards. These reports further monitoring of halibut avoidance efforts and have contributed to the success of the sector in maintaining operations despite the recent reduction in halibut limits.