



Halibut Abundance-Based Management Description of Alternatives

There are four alternatives under consideration by the Council. These have been developed through multiple discussion papers and Council considerations as well as consultation with stakeholders. The initial range of alternatives was adopted for all 4 sectors and was then (February 2020) modified to apply only to the Amendment 80 sector. The alternatives range from No Action (status quo) with fixed halibut PSC limits for Amendment 80 to PSC limits for A80 indexed to BSAI halibut abundance as measured by either the EBS trawl survey or the IPHC setline survey. All of the action alternatives were designed to index halibut PSC limits for the Amendment 80 sector to halibut abundance. The current halibut PSC limit for the Amendment 80 sector is a fixed amount established in the BSAI Groundfish FMP (currently at 1745 mt).¹ Changing the PSC limit for the Amendment 80 sector (under Alternatives 2, 3 and 4) requires amendments to both the FMP and federal regulations.

Only the PSC limit for Amendment 80 is affected by this action, all other PSC limits for BSAI halibut will remain as they are under the status quo.

Alternative 1: Status Quo. BSAI halibut PSC limits are fixed at 3,515 mt total for all sectors. Amendment 80 PSC limit is 1,745 mt.

Under the No Action alternative, or status quo, the BSAI PSC limits are set in the FMP and in regulation as an amount of halibut equivalent to 3,515 t of halibut mortality. The following four BSAI groundfish sectors have halibut PSC limits that total 3,515 t: Amendment 80 sector—1,745 t; BSAI trawl limited access sector (TLAS)—745 t; BSAI non-trawl sector²—710 t; and the CDQ Program—315 t (established as a PSQ reserve). The Amendment 80 trawl PSC limit is specifically allocated to the Amendment 80 cooperative(s) or the Amendment 80 limited access sector. The Amendment 80 sector is currently comprised of a single cooperative (Alaska Seafood Cooperative) and there is no limited access participation.

Alternative 2 through 4: A single index is used to set the Amendment 80 PSC limits. Limits for all other sectors remain fixed at their current levels. There are two options for selection of an index.

Option 1: NMFS EBS bottom trawl survey index.

Option 2: IPHC Area 4 setline survey index.

Elements and Options for Alternatives

Under Alternatives 2 through 4, the Amendment 80 sector halibut PSC limits would be calculated using a control rule applied to one of two indices: NMFS EBS bottom trawl survey index (**Option 1**) or IPHC Area 4 ABCDE setline survey index (**Option 2**). PSC limits for all other sectors would remain fixed as with under Status Quo.

Under these alternatives, Amendment 80 sector PSC limit would be calculated based upon the selected control rule (from amongst the Elements and Options below) applied to the estimated halibut biomass from either the EBS trawl survey or the IPHC setline survey in Area 4ABCDE. Under Alternatives 2

¹ See Section 3.3 for a description of the Amendment 80 sector.

² Hook and Line CP and CV only. PSC limits do not apply to pot or jig gear.

through 4 there are some Elements (with Options) that must be specified under any alternative formulation and additional Elements that are optional.

The elements and options described below define the control rule and the responsiveness to fluctuations in inter-annual changes in the biomass indices (see Figure 1-1 and Figure 1-2 for additional information on control rules and features). The first three elements address specifying the starting point for the PSC limit (**Element 1**), maximum PSC limit (**Element 2 Ceiling**), and minimum PSC limit (**Element 3 Floor**). An additional Element (**Element 4**) may be selected if breakpoints for the index are desired. The magnitude of the response (**Element 5**) must be specified for the index. The response (or slope) is defined as the change in the PSC limit relative to the change in the index. **Element 6** offers an optional provision for responsiveness to abundance changes by limiting the possible year-on-year percentage change in PSC limits. **Element 7** specifies breakpoints that may be specified in a lookup table rather than breakpoints and responsiveness in Elements 4 and 5 (where the PSC limit is defined continuously along the control rule). Finally, **Element 8** is specifically intended to further protect halibut spawning stock biomass at low levels of abundance.

Element 1: Starting point for PSC limit

The starting point is the value of the limit prescribed by the control rule when the indices are at the current year value (2019)³. Three options are provided. One option must be selected to formulate the control rule alternative.

Option 1. 2016 PSC limit (1,745 mt)

Option 2. 2016 PSC use (1,412 mt)

Option 3. 2017 PSC use (1,167 mt)

Element 2: Maximum PSC limit (ceiling)

Element 2 defines the maximum level of the PSC. Under this element the PSC limit would remain static at that level for all values of the index above that which provides for this PSC limit. Two options are provided. One option must be selected.

Option 1. 2016 PSC limit (1,745 mt)

Option 2. 2015 PSC limit (2,325 mt)

Element 3: Minimum PSC limit (floor)

Element 3 defines a minimum level of PSC annually, regardless of whether the control rule prescribes a lower value. Four options are provided under this element. One option must be selected.

Option 1. 2016 use (1,412 mt)

Option 2. ½ of 2016 PSC limit (873 mt)

Option 3. ½ of 2016 PSC use (706 mt)

Option 4. 664 mt (adjusted for 2018 A80 proportional usage of 1,000 mt)⁴

³ For purposes of consistency in this and subsequent drafts of this analysis the most current year is considered to be fixed at 2019.

⁴ The original value of 1000 mt was adopted when all sectors were included in the action. In 2018 total PSC was 2,022 and A80 PSC use was 1,343 which is 66.4% of total PSC use. This percentage was used to adjust the floor for Option 4 accordingly.

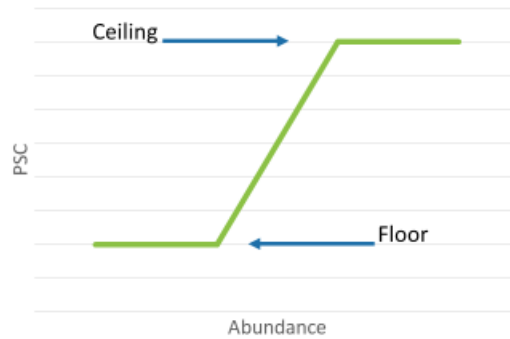


Figure 1-1 Example control rule (1:1 slope) with imposed ceilings and floors

Element 4: Breakpoint for index (optional)

Two options are considered for setting the breakpoints. Breakpoints define where the response or slope of the control rule changes depending on the value of the index. The breakpoints are then associated with the magnitude of the response to be selected under Element 5. This element is optional; however, one option must be selected if a breakpoint is desirable (unless Element 7 is selected).

Option 1. Index is 25% below or above average

Option 2. Index is above or below average

Element 5: Magnitude of the response to the index (slope)

This element describes the magnitude of the response to changes in the index (i.e. whether the slope is a constant 1:1 as with option 5 or varies at a steeper slope or shallower slope). At least one option may be selected under this element unless Element 7 is selected. Each option defines the modification that would occur when crossing a breakpoint (as specified in Element 4) or the slope in the absence of a breakpoint. There are five possible options.

Option 1. Up faster than 1:1

Option 2. Up slower than 1:1

Option 3. Down faster than 1:1

Option 4. Down slower than 1:1

Option 5. 1:1

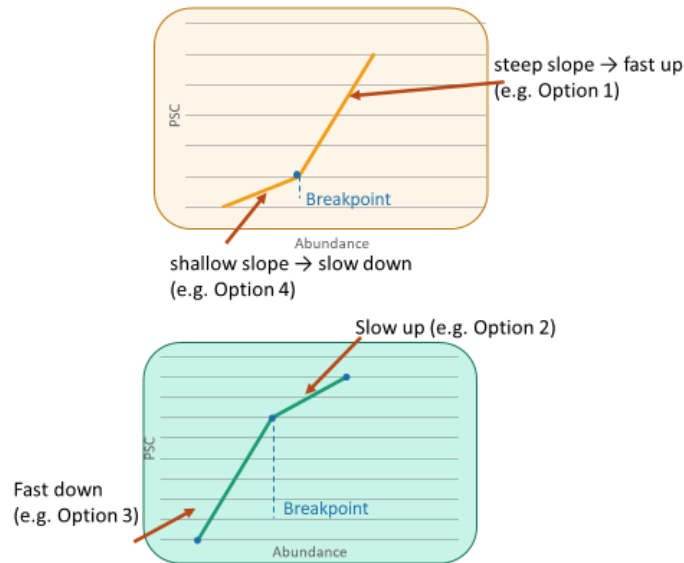


Figure 1-2. Different options for modifying the response under Element 5 across breakpoints to suit different policy objectives

For example, 1:1 means that a one-unit increase in the standardized index would result in an increase to the PSC limit equal to the value of the starting point. Therefore, when the responsiveness is defined as 1:1 the PSC limit is equal to the starting point at a standardized index value of 1 (as is for all alternatives) and is at a value of zero if the standardized index was zero. A change of less than one unit in the standardized index would result in a change in the PSC limit equal to the product of the proportional change in the index and the starting point PSC limit. For example, a 0.2 unit decrease in the standardized index would result in a reduction in the PSC limit of 20% of the starting point PSC limit. A responsiveness of 0.5:1 means a slower change and a responsiveness of 1.5:1 means a faster change (Figure 1-2).

Element 6: PSC limit responsiveness (constraint) to abundance changes (optional)

This element is optional. Three options are considered to modify how responsive the calculated PSC limit is to inter-annual changes in the selected index or indices. Options 1 through 3 may be selected if the Council wishes to limit the inter-annual variability of the PSC limit. This element is imposed *after* the PSC limit itself is calculated. A sub-option may be specified to limit the amount of change between the current (status quo) PSC limit and the limit in the first year of newly specified ABM PSC limits as a result of this action to reduce the potential variability in Year 1 of implementation.

Option 1: PSC limit varies no more than 5% per year

Option 2: PSC limit varies no more than 15% per year

Option 3: PSC limit varies no more than 25% per year

Sub-option: This element could be applied to limit the amount of change between the current PSC limits and the limit at the point of this action’s implementation.

Element 7: Look-up Table Breakpoints (optional)

This element is optional and would replace Elements 4 and 5. Here breakpoints would be defined in a look-up table with a maximum of 12 breakpoints (creating up to an 11X11 look-up table). This would result in different breakpoints and responsiveness than what would occur under Elements 4 and 5. If Element 7 is selected it would not be necessary to select Elements 4 and 5. Here the index may be specified in one of two ways:

Option 1: standardize to the average of 1998-2019

Option 2: standardize to the current year (2019)⁵

Element 8: Protect halibut stocks at low levels of abundance (optional)

Here the PSC limit is decreased further than determined by application of the previous elements when the Coastwide spawning biomass falls below 30% of its unfished biomass level (Figure 1-3). This element is optional and can be applied to any of the alternatives. Note that if Element 6 is also selected than Element 8 would be constrained by the maximum change employed under Element 6. Element 8 would also be constrained by the floor selected under Element 3.

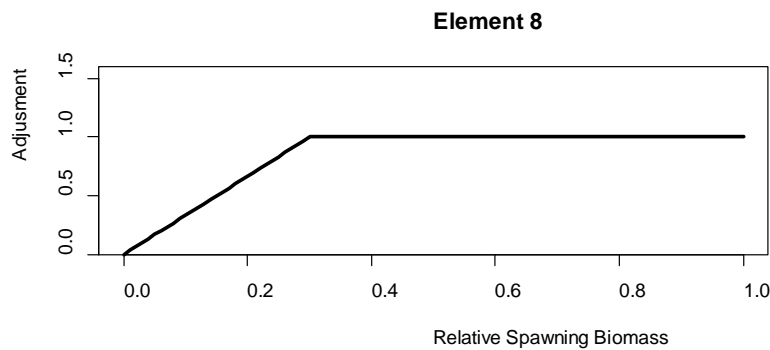


Figure 1-3 Illustration of how Element 8 would be applied whereby the PSC limit is reduced further when Coastwide Spawning stock biomass decreases below 30% of its unfished level.

This element is optional and can be applied to any of the alternatives. When the Coastwide spawning stock biomass falls below $B_{30\%}$, the PSC limit calculated for a given alternative is further multiplied by the current level of Coastwide spawning stock biomass (B) divided by $B_{30\%}$ ($\text{PSC limit} * B / B_{30\%}$).

Of these, selection of an option under Elements 1,2,3 and 5 are required; Elements 4, 6, 7 and 8 are optional. If Element 7 is selected there is no need to select options under Elements 4 and 5. The following are the alternatives from within the range reflected in these Elements and Options adopted by the Council and for analysis in the DEIS. Some of the selected options for Alternatives 2-4 differ slightly from those listed above but fall within the range of the numbers reflected in the options. These changes are noted accordingly within the description of the alternative.

Alternative 2

Alternative 2 originated as a proposal from the Amendment 80 fleet representatives on the ABM Stakeholder Committee. This alternative (formerly listed as Alt 2-2) had been expanded previously to apply to all sectors but with the new focused analysis on the A80 fleet only has been returned to its original proposal. The index employed is the EBS trawl survey.

The alternative combines Elements 1-5. The starting point is 1,745 (Element 1 Option 1 2016 PSC limit). The ceiling is 2,325 (Element 2 Option 2 2015 PSC Limit). The floor is 1,412 (Element 3 Option 1 2016

⁵ For purposes of consistency in this and subsequent drafts of this analysis the most current year is considered to be fixed at 2019.

PSC use). The breakpoints (Elements 4 and 5) are as follows and form a stair stepped control rule based on the two-year average of the EBS trawl survey biomass.

When the 2-year average of trawl survey biomass is below 100,000 t the PSC limit is at the floor (1,412 mt). For values between 100,000-123,999 mt the PSC limit is at the starting point (step 1): 1,745 mt. When the trawl survey biomass is between 124,000-174,999 mt the PSC limit is at step 2: 2,025 mt. Finally trawl survey values over 175,000 mt the PSC limit is at the ceiling: 2,325 mt⁶.

Alternative 3

Alternative 3 is a modified version of an alternative submitted by Fishing Vessels Owners Association (FVOA) representatives on the ABM Stakeholder Workgroup. This alternative (initially numbered 2-4 in the October 2019 draft) was modified by the Council at the time of adoption (February 2018) to impose a floor (one was not included in the initial proposed scenario). This alternative has been further modified from the October 2019 version by the Council in February 2020 to modify the starting point and the responsiveness. In order to apply this alternative to the Amendment 80 sector only we have adjusted the values of Elements 1-3 by the actual usage for the year specified or proportion of the 2018 actual usage that applies to the A80. Values previously adopted by the Council were the aggregate for all sectors.

Alternative 3 uses the IPHC setline index. The starting point (Element 1) is 1,255 mt. The original value was for the aggregate of all sectors (2,018 mt) which was proposed as it represented the average of 2017-2018 usage by all sectors. Here the average of the A80 usage from 2017-2018 is used. The ceiling is 1,745 (Element 2 Option 1 2016 PSC limit). The floor is 664 mt which represents the proportional 2018 usage from A80 applied to the original value of 1,000 mt (Element 3 Option 4). The breakpoint is at the starting point which falls within the range of specified options for Element 4. The magnitude of the response (Element 5) is 2:1 below the starting point and 1:1 above the starting point. Finally, the limit on inter-annual variability (applied after the PSC limit is calculated) is no more than a 15% change (Element 6 Option 2).

Alternative 4

Alternative 4 is a modified version of an alternative submitted by the Directed Halibut user representatives on the ABM Stakeholder Workgroup. This alternative (initially numbered 3-2a_update in the October 2019 draft) was modified by the Council from the October 2019 version by the Council in February 2020 to remove the secondary index (and their relationship in Elements 4 and 5). To apply this alternative to the Amendment 80 sector only we have adjusted the values of Elements 1-3 by the actual usage or proportion of the actual usage that applies to the A80 for the year specified. Values previously adopted by the Council were the aggregate for all sectors.

Alternative 4 uses the IPHC setline index. The starting point is 1,167 mt (Element 1 Option 3 2017 PSC use). The ceiling is 1,745 (Element 2 Option 1 2016 PSC limit). The floor is 664 mt which represents the proportional 2018 usage from A80 applied to the original value of 1,000 mt (Element 3 Option 4). The slope is 1:1 between the ceiling and the floor. The limit on inter-annual variability (applied after the PSC limit is calculated) is no more than 20% change which falls within the range of options under Element 6 (range of 5-25%). Element 8 is applied this this alternative such that when the Coastwide spawning stock

⁶ Note that this alternative does not include a separate scenario in the Amendment 80 submission of the ceiling for the PSC limit set at 2,625 mt when the trawl survey is over 200,000 mt as this aspect of the proposal as not adopted by the Council in the development of alternatives.

biomass falls below $B_{30\%}$, the PSC limit calculated for a given alternative is further multiplied by the current level of biomass (B) divided by $B_{30\%}$ (PSC limit * B/ $B_{30\%}$).⁷

Comparison of Alternatives

Table 1-1 shows the Elements and Options for the three action alternatives in the October 2020 analysis as well as the No Action alternative (status quo).

Table 1-1 Comparison of Elements and Options for the 4 ABM alternatives analyzed

| Alternative | Previously numbered (Oct 2019) | Source | Survey Index | E 1 Starting point | E 2 Ceiling | E 3 Floor | E 4 Breakpoint | E 5 Magnitude | E 6 Constraint | E 7 Look-up Table | E 8 SSB low levels of abundance |
|-------------|--------------------------------|------------------------|--------------|--------------------|-------------|-----------|----------------|------------------------|----------------|-------------------|---------------------------------|
| 1 | 1 | Status Quo | NA | | | | | 1,745 fixed PSC limit | | | |
| 2 | 2-2 | A80 | Trawl | 1,745 | 2,325 | 1,412 | 3 specified | Stairsteps | 2 yr avg | NA | NA |
| 3 | 2-4 | FVOA | Setline | 1,255 | 1,745 | 664 | 1,255 | 1:1 above 2:1 below | 15% max | NA | NA |
| 4 | 3-3a_update | Directed halibut users | Setline | 1,167 | 1,745 | 664 | NA | 1:1 | 20% max | NA | Yes |

⁷ Note that Element 8 was added to the Alternative set in February 2020 without modification of any of the Alternatives to adopt this optional provision. As this concept was first proposed by the directed halibut fishery stakeholders the analysts added this provision to this Alternative.