

SUPPLEMENTAL ANALYSES FOR APPENDIX B OF THE PRELIMINARY DRAFT 2015-  
2016 GROUND FISH HARVEST SPECIFICATIONS AND MANAGEMENT MEASURES

The following attachments contain a revision and an addition to Appendix B of the Preliminary Draft 2015-2016 Groundfish Harvest Specifications and Management Measures, provided by members of the Groundfish Management Team ([Agenda Item F.7.a, Attachment 5](#) – Electronic Only and [Agenda Item F.7.a, Attachment 6](#) - Excerpts). The first analysis, B.7 Non-Trawl: Lingcod Trip Limit Increases, is intended to replace the analysis contained in Appendix B. The second, Lingcod Bag Limit Analyses, is an addition to Appendix B.

Year	Washington <sup>1/</sup>	Oregon		California N. 40°10' N. Lat.	
	Recreational	Recreational	Commercial	Commercial	Recreational
	South Coast, 30 fm March 15-June 15				
2011	year-round season; 10 rockfish bag limit; North Coast, 20 fm June 1 - Sept 30; South Coast, 30 fm March 15-June 15	year round season; 20 and 40 fm Apr- Sept; 7 fish	20 fm South <sup>2/</sup> 30 fm North <sup>2/</sup>	20 fm Trip limits increased & restructured	20 fm, 10 fish, May 15 - Oct 31
2012	year-round season; 10 rockfish bag limit; North Coast, 20 fm June 1 - Sept 30; South Coast 30 fm March 15-June 15	year round season; 30 fm Apr- Sept; 7 fish	20 fm South <sup>2/</sup> 30 fm North <sup>2/</sup>	20 fm Trip limits increased	20 fm, 10 fish, May 15 - Oct 31

<sup>1/</sup> Washington has not had a commercial nearshore fishery since 1995

<sup>2/</sup> The shoreward RCA was 20 fm from the California border to 43° N latitude, and 30 fm from 43° N. latitude to Washington border.

## B.6 Non-Trawl: Slope Rockfish Trip Limit Reductions

*Analysis of this management measure was not received by the Advanced Briefing Book deadline; it is expected to be delivered as a Supplemental GMT Report.*

## B.7 Non-Trawl: Lingcod Trip Limit Increases

### Need for Action

For 2013-2014 groundfish fisheries, lingcod has been managed, in part, by cumulative bi-monthly trip limits designed to keep catches within the respective ACLs. Trip limits may be adjusted inseason as a result of inseason tracking patterns (higher/lower than projected). This applies to lingcod taken in both the non-nearshore (all three states) and nearshore fisheries (Oregon and California only).

At its April 2014 meeting, the Pacific Fishery Management Council (Council) directed the Groundfish Management Team (GMT) to complete an analysis of various lingcod trip limit and open season options for the west coast commercial non-trawl fixed-gear fishery to estimate economic and biological impacts. Current trip limits and open seasons are given in (No Action = Option 1a). The proposed trip limit and open season configurations (Options 1b and 1c) are summarized in Table B-32, with all trip limits reported in lb per vessel.

Initial analyses were provided to the Council at the April meeting for trip limit options during the open season ([Agenda Item C.4.b, REVISED GMT Report](#), April 2014; pages 39-52 and below in Section B.8) and options for lingcod retention during the currently closed periods ([Agenda Item C.4.b, REVISED](#)

[GMT Report](#), April 2014; pages 52-63). This document combines results of those previous, separate analyses. Additional details can be found in that April 2014 GMT statement.

**Table B-37. No Action Option (Option 1a) for the limited entry and open access non-trawl fixed-gear trip limits (in lb) in effect in 2014 that apply to both north and south of 40°10' N. latitude.**

Fleet	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec <sup>a</sup>
Limited entry	closed	closed	800	800	800	400/closed
Open access	closed	closed	400/month			400/closed

<sup>a</sup>The lingcod commercial fishery is closed from December 1<sup>st</sup> of a given year through April 30<sup>th</sup> of the subsequent year (five months total). Therefore, the Nov/Dec trip limit applies only to November.

A critical point in the analysis of lingcod trip limits is how proposed increases in the coastwide trip limit structure may affect the mortality of overfished species (OFS) – primarily the OFS rockfish species, in both the non-nearshore and nearshore fisheries. The approach to these proposed trip limit increases does assume that OFS mortality will not be affected in the non-nearshore fishery because any lingcod catch is mostly incidental to the targeting of sablefish; fishing behavior will likely not change because the main target will continue to be sablefish, the much more lucrative fishery. Therefore, it is assumed that any increase in lingcod mortality (landings) will only affect OFS mortality in the Oregon and California nearshore fisheries (Washington has not had a commercial nearshore fishery since 1995).

Additionally, it is prudent to point out that there is probably little to no chance of increased China rockfish impacts under Alternative 1b and 2a (below). Opening the closed season for lingcod retention will not cause increase catch of any rockfish species (OFS or China), because the proposed increases are equal to or less than average encounter rates of lingcod during the closed season (based on WCGOP bycatch rates during December-April). Increasing the lingcod trip limit during the open season showed some increase in OFS for the 50% increase. On the other hand, the increase in canary rockfish was significant when lingcod was increased by 100%. It is expected that other nearshore rockfish mortality to also increase under that scenario (2b).

**Table B-38. Lingcod commercial coastwide trip limits (reported in lb per vessel) comparing the No Action Option (Option 1a) to options that increase the bi-monthly trip limit to 1,200 lb and 1,600 lb for the limited entry sector and increases to 600 lb per month and 800 lb per month for the open access sector (Options 1b, and 1c). Also presented are proposed trip limits that establish trip limits for periods 1 and 2 and December, with period 2 closed south of 40°10' N. latitude for both sectors (Options 2a and 2b).**

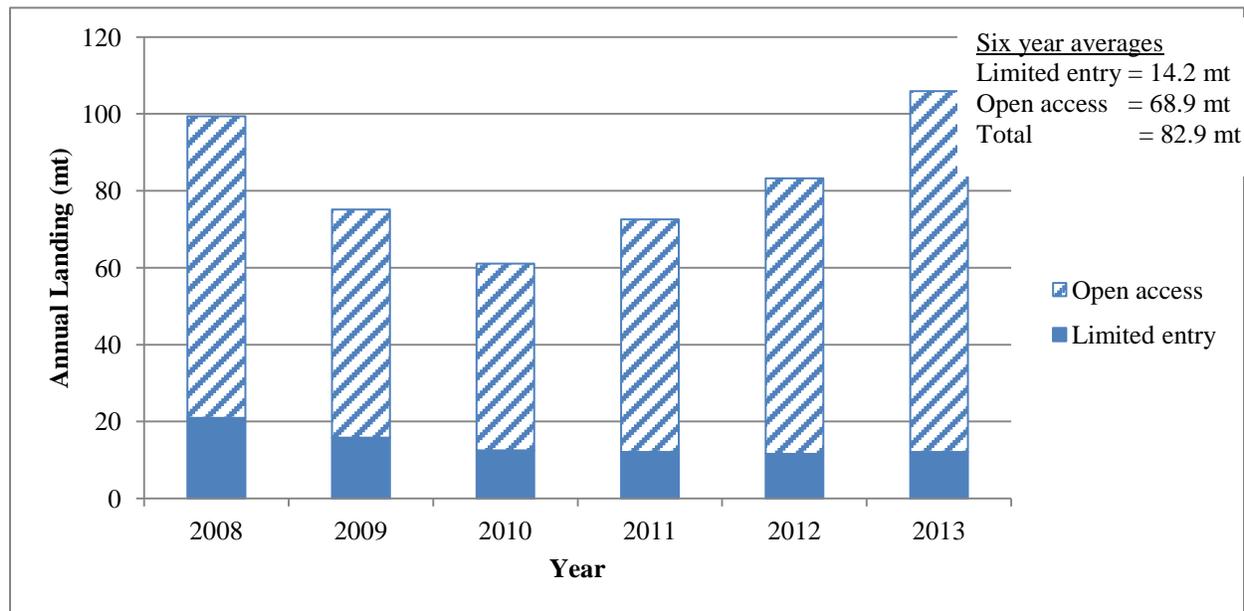
Proposed lingcod trip limits based on the No Action Option (1a) and Options 1b and 1c						
Limited entry	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sept/Oct	Nov/Dec
Option 1a	closed	closed	800	800	800	400 (Nov only)
Option 1b	closed	closed	1,200	1,200	1,200	600 (Nov only)
Option 1c	closed	closed	1,600	1,600	1,600	800 (Nov only)
Open access						
Option 1a	closed	closed	400 lb/month (Dec closed)			
Option 1b	closed	closed	600 lb/month (Dec closed)			
Option 1c	closed	closed	800 lb/month (Dec closed)			
Proposed lingcod trip limits that apply to the area NORTH of 40°10' N. latitude with a year-long season structure						
Limited entry	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sept/Oct	Nov/Dec
Option 2a	200 lb/2 months	200 lb/2 months	1,200 lb	1,200 lb	1,200 lb	600 lb for Nov (200 lb for Dec)
Option 2b	200 lb/2 months	200 lb/2 months	1,600 lb	1,600 lb	1,600 lb	800 lb for Nov (200 lb for Dec)
Open access						
Option 2a	100 lb/month	100 lb/month	600 lb/month (100 lb for Dec)			
Option 2b	100 lb/month	100 lb/month	800 lb/month (100 lb for Dec)			
Proposed lingcod trip limits that apply to the area SOUTH of 40°10' N. latitude with March/April closed						
Limited entry	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sept/Oct	Nov/Dec
Option 2a	200 lb/2 months	closed	800 lb	800 lb	800 lb	400 lb for Nov (200 lb for Dec)
Option 2b	200 lb/2 months	closed	800 lb	800 lb	800 lb	400 lb for Nov (200 lb for Dec)
Open access						
Option 2a	100 lb/month	closed	400 lb/month (100 lb for Dec)			
Option 2b	100 lb/month	closed	400 lb/month (100 lb for Dec)			

## Background

Lingcod was declared overfished in 1999. In 2005, the stock was designated as rebuilt and a coastwide trip limit structure was established that has essentially stayed the same since. Lingcod trip limits have not been modified since 2005 for the limited entry (LE) sector and since 2007 for the open access sector (OA). Since 2007, no inseason adjustments have been made due to fishing mortality concerns for lingcod. At least one industry request was made for an inseason trip limit increase but was not supported by the GMT ([Agenda Item E.2.b, Supplemental GMT Report 2](#), April 2008). This was because the GMT was concerned that any increase in lingcod trip limits and subsequent targeting could have resulted in increased bycatch of canary and yelloweye rockfish. Regarding the OA sector, the GMT expressed concerns that since the number of participants in that fishery was unlimited (as is still the case), any increase in lingcod trip limits could have led to a rapid expansion in the fishery, without any corresponding accountability measures for bycatch of overfished species. And finally, since the trip limits at that time weren't being attained in either the LE or OA fisheries, the GMT did not support an increase.

Since 2008, the coastwide commercial non-trawl fixed-gear catch of lingcod averaged 82.9 mt (Figure B-22) with the majority of landings made by the OA sector. In 2011 and 2012, total mortality by the non-trawl fixed-gear fleet was 3.0 percent and 3.5 percent, respectively, of the non-trawl allocation. For the 2015-2016 biennial management cycle, the Council is considering increases in lingcod trip limits for both the LE and OA non-trawl fixed-gear sectors to provide more fishing opportunity to the fishing communities in the three states. Additionally, a request was made by industry to explore the possibility of allowing the fleet to land modest amounts during those periods, or months, that are currently closed. This analysis estimates the potential harvest mortality under the various trip limit scenarios and open seasons to assist the Council in its decision for a Preferred Alternative. It also provides estimated mortality

amounts for overfished species that are taken in the nearshore commercial fisheries for Oregon and California when lingcod are also taken (Washington does not have a commercial nearshore fishery).



**Figure B-22. Coastwide landings of lingcod by the commercial non-trawl fixed-gear fleet for both the limited entry and open access sectors from 2008 to 2013. The 2013 data are preliminary (data source: PacFIN vdrfd).**

### Methods

A catch-based fleet capacity trip limit model was used, and based on the years from 2008 to 2012. Commercial landings data from PacFIN’s vdrfd table were extracted on April 22, 2014 for analysis. Filters were applied to only include: 1) landings made by non-IFQ, shorebased vessels (this applied to 2011 and 2012), 2) hook-and-line or trap gear, 3) Dahl sectors 5 to 10, 12, and 15<sup>16</sup>, 4) for the nearshore bycatch model, only those Oregon and California lingcod landings that also showed nearshore species landings, and 5) port of landing north and south of 40°10' N. latitude to identify management area. The model uses a method that establishes a proportion for each participating vessel per period whereby that vessel’s actual harvest mortality, as reported from the commercial dealer receipts, is compared to the theoretical maximum that that vessel could have taken. This proportion percentage is then applied to the proposed trip limit for each vessel for each period of allowable fishing. After completing this for all vessels for all periods, the estimated harvest for the fleet is summed for a final annual estimate which is then compared to the annual ACL and/or the non-trawl allocation portion of the ACL.

In addition to the above routine, a portion of the estimated landings under the various trip limit scenarios was identified as those made in conjunction with landings of nearshore species (above). These estimated lingcod landings then inputted into the GMT’s nearshore bycatch model to provide estimates of the mortality of overfished species.

More details on methods can be found in Agenda Item C.4.b, REVISED GMT Report, April 2014 (pages 39-52).

<sup>16</sup> Dahl sectors are: 5 nearshore (limited entry), 6 nearshore (open access), 7 non-nearshore (limited entry), 8 non-nearshore (open access), 9 non-nearshore non-sablefish (limited entry), 10 non-nearshore non-sablefish (open access), 12 incidental open access, and 15 commercial non-groundfish.

## Results

Lingcod mortality estimates are provided in Table B-34 and Table B-35 for the combined sector options under the different P\* values for 2015 and 2016. A final LE and OA sector summary is presented in Table B-36, and lastly overfished species mortality estimates are provided in Table B-37. More detail regarding these estimates is provided below. Also, a comprehensive discussion about trip limits for periods 1 and 2 and December is included in [Agenda Item C.4.b, REVISED GMT Report](#), April 2014, pages 52-63).

**Table B-39. Lingcod coastwide commercial mortality estimates using the status quo season structure (closed during periods 1, 2 and December coastwide) comparing No Action (Option 1a) to Options 1b and 1c. The limited entry bimonthly trip limits are shown, along with open access monthly trip limits in parentheses.**

LIMITED ENTRY + OPEN ACCESS (coastwide) at P* = 0.45						
	Proposed Bimonthly and Monthly Trip Limits (lb)	Estimated Take (mt)	2015		2016	
			Non-trawl Allocation (mt)	Percent of Allocation	Non-trawl Allocation (mt)	Percent of Allocation
Option 1a	800 (400)	88.9	1,950.7	4.6%	1,857.8	4.8%
Option 1b	1,200 (600)	122.3	1,950.7	6.3%	1,857.8	6.6%
Option 1c	1,600 (800)	155.1	1,950.7	8.0%	1,857.8	8.3%

LIMITED ENTRY + OPEN ACCESS (coastwide) at P* = 0.25						
	Proposed Bimonthly and monthly Trip Limits (lb)	Estimated Take (mt)	2015		2016	
			Non-trawl Allocation (mt)	Percent of Allocation	Non-trawl Allocation (mt)	Percent of Allocation
Option 1a	800 (400)	88.9	1,444.1	6.2%	1,375.4	6.5%
Option 1b	1,200 (600)	122.3	1,444.1	8.5%	1,375.4	8.9%
Option 1c	1,600 (800)	155.1	1,444.1	10.7%	1,375.4	11.3%

Note: For the limited entry sector, the November trip limits are 400 lb under Option 1a, 600 lb under Option 1b, and 800 lb under Option 1c. The non-trawl allocations are a combination of those for north and south of 40°10' N. latitude as presented in [Agenda Item C.4.a, Supplemental REVISED Attachment 2](#)., April 2014.

**Table B-40. Lingcod coastwide commercial mortality estimates under Options 2a and 2b. Season structure modifications for each sector are shown in Table B-33.**

LIMITED ENTRY + OPEN ACCESS (coastwide) at P* = 0.45					
		2015		2016	
Option	Estimated Take (mt)	Non-trawl Allocation (mt)	Percent of Allocation	Non-trawl Allocation (mt)	Percent of Allocation
Option 2a	135.1	1,950.7	6.9%	1,857.8	7.3%
Option 2b	173.4	1,950.7	8.9%	1,857.8	9.3%

LIMITED ENTRY + OPEN ACCESS (coastwide) at P* = 0.25					
		2015		2016	
Option	Estimated Take (mt)	Non-trawl Allocation (mt)	Percent of Allocation	Non-trawl Allocation (mt)	Percent of Allocation
Option 2a	135.1	1,444.1	9.4%	1,375.4	9.8%
Option 2b	173.4	1,444.1	12.0%	1,375.4	12.6%

Notes: South of 40°10' N. latitude the fishery will continue to be closed. The non-trawl allocations are a combination of those for north and south of 40°10' N. latitude as presented in Agenda Item C.4.a Supplement REVISED Attachment 2, April 2014.

**Table B-41. Summary of overall coastwide commercial lingcod mortality estimates for the limited entry and open access sectors for Options 1a, 1b, 1c, 2a, and 2b.**

Option	Trip Limits		Mortality Estimates		
	Limited Entry (bi-monthly)	Open Access (monthly)	Limited Entry	Open Access	Total
1a (No Action)	800	400	16.9	72.0	88.9
1b	1,200	600	24.7	97.6	122.3
1c	1,600	800	31.8	123.3	155.1
2a	1,200	600	30.2	104.9	135.1
2b	1,600	800	37.9	135.5	173.4

Note: These trip limit amounts in this table refer to the bi-monthly limited entry sector, whereas the OA sector trip limits are set on a per month basis at one-half the limited entry amount. Refer to Table B-33 for the detailed summary of the actual trip limit amounts.

**Table B-42. Overfished species mortality estimates (mt) under the No Action Option (1a), Option 1b, and Option 1c (season structure maintained with periods 1 and 2 and December closed), and under the 2a and 2b options that reflect the season structure modification (i.e., open January – December). These values were calculated by using the five-year commercial averages (2008-2012) of the nearshore species inserted into the nearshore bycatch model.**

	Estimated mortality under options with the current season structure in place		
	Option 1a – 800 lb	Option 1b – 1,200 lb	Option 1c – 1,600 lb
Bocaccio	0.4	0.4	0.4
Canary rockfish	6.5	6.6	6.7
Cowcod	0.0	0.0	0.0
Darkblotched rockfish	0.2	0.2	0.2
Yelloweye rockfish	1.1	1.2	1.3

	Estimated mortality under options with an expanded season structure	
	Option 2a – 1,200 lb	Option 2b – 1,600 lb
Bocaccio	0.4	0.4
Canary rockfish	6.7	6.8
Cowcod	0.0	0.0
Darkblotched rockfish	0.2	0.2
Yelloweye rockfish	1.2	1.3

**Comparison of Options** (Options 1a, 1b, and 1c)

Under Options 1a, 1b and 1c, the coastwide bi-monthly trip limit structure would be maintained whereby commercial retention of lingcod is permitted during periods 3 (May/June), 4 (July/August), 5 (September/October) and November. Retention of lingcod would not be allowed during period 1 (January/February), period 2 (March/April) and in December. Under these three options, trip limit adjustments are considered only for the management area north of 40°10' N. latitude. South of 40°10' N. latitude, the status quo trip limits and season structure would remain in effect for all three options.

No Action (Option 1a)

For 2014, the lingcod commercial bi-monthly non-trawl fixed-gear trip limit for the LE sector is 800 lb per period with 400 lb for November. Fishing would continue to be closed during periods 1 and 2 and December. For the OA sector, trip limits are set at 400 lb per month. Again, periods 1 and 2 and December are closed. These amounts apply on a per vessel basis and apply to all three states. Under the No Action Option (Option 1a), the expected harvest mortality, for both the P\* = 0.45 and P\* = 0.25 approach, would be less than 10 percent of the non-trawl allocation (Table B-34). The total combined LE and OA mortality would be 88.9 mt.

Fishing Activity Under Option 1a

Under the No Action Option, fishing activity is not expected to change. The number of vessels that will fish would be expected to be about the same as have participated in the fishery over the last few years (Table B-38). In addition, fishing effort per vessel and fishing area are expected to be similar under Option 1a.

**Table B-43. Number of vessels in the non-nearshore and nearshore fisheries that made lingcod landings (regardless of the amount) for the three states from 2008 to 2012. Includes both LE and OA vessels.**

State	2008	2009	2010	2011	2012	5-Year Avg.
Washington	44	32	37	31	41	37
Oregon	228	219	196	200	202	209
California	251	222	206	223	264	233

**Biological Impacts Under Option 1a**

With no expected increase in mortality, there are no anticipated biological impacts.

*Projected Overfished Species Mortality Under Option 1a*

A critical consideration in the lingcod fishery are those catches (landings) that are made in conjunction with nearshore species. These nearshore fishery landings are those that are applied to the nearshore bycatch model as a component necessary for the estimation of overfished species (OFS) mortality. With no expected increase in the take of lingcod and no expected change in fishing behavior under this option, it is also expected that no increase in OFS mortality will be experienced.

**Stock Status**

Currently, the coastwide lingcod stock is considered healthy. As of the last stock assessment, the point estimate for the depletion of the spawning output (= spawning biomass) at the start of 2009 was 61.9 percent for north of 40°10' N. latitude , 73.7 percent south of 40°10' N. latitude, and 67.0 percent coast wide (Hamel et al. 2009).

**Socioeconomic Impacts Under Option 1a**

None are expected.

*Option 1b*

Option 1b maintains the closures during periods 1 and 2 and December. This option also increases the current LE sector trip limit from 800 lb per two months to 1,200 lb per two months and increases the November trip limit from 400 lb to 600 lb. The OA sector trip limit would increase from 400 lb per month to 600 lb per month. The original management measure consideration for this option was to analyze trip limit increases only for the fishery north of 40°10' N. latitude. Trip limit amounts south of 40°10' N. latitude are to be left as is (i.e., remain status quo). Mortality would be expected to increase from 88.9 mt. Under No Action Option 1a to 122.3 mt (37.6 percent increase) under Option 1b, with the majority of this increase coming from the OA sector. Here too, the expected landings mortality would be less than 10 percent of the non-trawl allocation amount at both the P\* = 0.45 and P\* = 0.25 levels.

**Fishing Activity Under Option 1b**

With larger trip limits (from 800 lb to 1,200 lb per period for the LE sector and from 400 lb to 600 lb per month for the OA sector) it is reasonable to expect an increase in overall mortality. Table B-36 shows mortality will increase from 88.9 mt (No Action) to 122.3 mt under Option 1b. Despite this expected increase, the total annual mortality will still be substantially less than the non-trawl allocation amount. It is speculated that this modest increase would not generate a surge in fishing activity.

**Biological Impacts Under Option 1b**

Because the stock is considered very healthy, the 37.6 percent increase (33.4 mt) will have a relatively minor effect on the stock's status. A total mortality of 122.3 mt represents < 10 percent of the non-trawl fixed gear allocation. Projected mortality would not jeopardize the stock's status nor cause the fishery to exceed the non-trawl allocation portion of the annual ACL.

### *Projected Overfished Species Mortality Under Option 1b*

Two overfished species are of major concern: canary and yelloweye rockfish. These two species have been (and will continue to be) the most constraining component of the lingcod fishery and largest concern when considering lingcod trip limit increases. Under this option, both species will experience an approximate 0.1 mt increase from the No Action Option. As per the Preferred Alternative, canary rockfish has a directed nearshore allocation of 6.7 mt (2015) and 6.9 mt (2016) and yelloweye rockfish has a directed nearshore allocation of 1.2 mt (2015) and 1.3 mt (2016). The projected mortality under this option (6.6 mt for canary and 1.2 mt for yelloweye) are equal to or less than the Preferred Alternative nearshore allocations.

### **Stock Status**

Similar to the No Action Option 1a, the stock is expected to remain healthy with no adverse effects from this modest increase in harvest mortality.

### **Socioeconomic Impacts Under Option 1b**

Under this option, the projected increase in total annual landings for both the non-nearshore and nearshore fisheries would be approximately 75,200 lb (34.1 mt). Using the most recent commercial landings data from 2013 as a benchmark, the average coastwide price is \$2.50 per pound. Applied to the projected increase of 75,200 lb, the fishery could earn an additional \$188,000 compared to the No Action status quo amount – all else being equal.

### *Option 1c*

Option 1c maintains the closures during periods 1 and 2 and December. This option also increases the current LE sector trip limit from 800 lb per two months to 1,600 lb per two months and increases the OA sector trip limit from 400 lb per month to 800 lb per month. The original management measure consideration for this option was to analyze trip limit increases only for the fishery north of 40°10' N. latitude. Trip limit amounts south of 40°10' N. latitude are to remain status quo. Mortality would be expected to increase from 88.9 mt under No Action Option 1a to 155.1 mt (a 74.5 percent increase), with the majority of this increase, again coming from the OA sector. Under this option the projected landings mortality would be less than 10 percent of the non-trawl allocation amount at  $P^* = 0.45$  but would be just over 10% (for both 2015 and 2016) for  $P^* = 0.25$  (Table B-34).

### **Fishing Activity Under Option 1c**

With larger trip limits (from 800 lb to 1,600 lb per period for the LE sector and from 400 lb to 800 lb per month for the OA sector), it is reasonable to expect an increase in overall mortality. It is possible that there may be a change in fishing behavior with more participants participating in the fishery, but presently it is difficult to estimate what that number may be. Table B-36 shows mortality will increase from 88.9 mt (No Action) to 155.1 mt under Option 1c. Despite this expected increase, the total annual mortality will still be substantially less than the non-trawl allocation amount.

### **Biological Impacts Under Option 1c**

Because the stock is considered very healthy, the 74.5 percent increase (66 mt) compared to the No Action Option will have a relatively minor effect on the stock's status. A total mortality of 155.1 mt under this option represents 10.7 percent of the non-trawl allocation for 2015.

### *Projected Overfished Species Mortality Under Option 1c*

As is the case under Option 1b canary and yelloweye rockfish are the two species that have been (and will continue to be) the most constraining component of the lingcod fishery and largest concern when considering lingcod trip limit increases. Under this option, both species will experience an approximate 0.2 mt increase from the No Action option projection. As per the Preferred Alternative, canary rockfish

has a directed nearshore allocation of 6.7 mt (2015) and 6.9 mt (2016) and yelloweye rockfish has a directed nearshore allocation of 1.2 mt (2015) and 1.3 mt (2016). The projected mortality of canary under this option is 6.7 mt, which is equal to the Preferred Alternative nearshore allocation (this mortality is 0.2 mt more than the nearshore allocation under than the No Action option estimate of 6.5 mt). For yelloweye, projected mortality under this option is 1.3 mt, which exceeds the Preferred Alternative nearshore allocation for 2015 by 0.1 and equals the Preferred Alternative nearshore allocation for 2016. A mortality of 1.3 mt exceeds the mortality under No Action estimated impact by 0.2 mt.

### **Stock Status**

Similar to the No Action Option 1a, the stock is expected to remain healthy with no adverse effects from this increase in harvest mortality.

### **Socioeconomic Impacts Under Option 1c**

Under this option, the projected increase compared to the No Action Option in total annual coastwide landings would be approximately 146,000 lb (66 mt). Applying the \$2.50 per pound value described above provides an estimate that the fishery could earn an additional \$365,000 compared to the No Action status quo amount – all else being equal.

### **Options Overview (Options 2a and 2b)**

Under Options 2a and 2b, the coastwide trip limit structure would be modified to accommodate modest trip limits for periods 1 and 2 and December for both the LE and OA sectors (Table B-32). Under these two options, the take of lingcod would be allowed during all periods and months during the year, but only for the management area north of 40°10' N. latitude. South of 40°10' N. latitude, retention of lingcod would continue to be prohibited for both sectors during March and April. Trip limits would also be increased from May-November under these options relative to No Action (Option 1). See Table B-33 for trip limit details.

#### *Option 2a*

The intent of Option 2a is to allow retention and landings of lingcod that would otherwise be discarded during the closed season, in addition to increasing trip limits during the currently open season to increase attainment of the non-trawl allocation. Under this option north of 40°10' N. latitude, the LE sector would have a 200 pound trip limit per two months for periods 1 and 2 and 200 lb for December. This sector would also have a 1,200 pound trip limit for periods 3 through 5 and 600 lb in November. South of 40°10' N. latitude, the LE sector would have a 200 lb per two-month limit for periods 1 and 200 pounds for December. The sector would continue to have an 800 lb per two-month limit for periods 3 through 5 and 400 lb for November. Period 2 would remain closed.

For the OA sector north of 40°10' N. latitude, the monthly trip limit would be 100 lb during periods 1 and 2 and 100 lb in December. Additionally, this sector would have a 600 pound monthly trip limit for periods 3 through 5 and November. For the OA sector south of 40°10' N. latitude, a 100 lb per month trip limit would apply for period 1 and for December. Period 2 would remain closed and all the other months would continue to have a 400 lb per month trip limit.

Under this option south of 40°10' N. latitude, March and April would continue to be closed to the retention of lingcod for both the LE and OA sectors. This is proposed because the additional opportunity to fish for lingcod south of 40°10' N. latitude in period 2, when rockfish is closed, presents the possibility of additional mortality of overfished rockfish as well as discarding of other healthy rockfish species while targeting lingcod. See Table B-33 for a summary of trip limit details.

### **Fishing Activity Under Option 2a**

With larger trip limits compared to the No Action Option it is reasonable to expect a modest increase in overall annual lingcod mortality. Compared to the projection for the No Action Option (88.9 mt), the projected mortality would be 135.1 mt, an increase of 46.2 mt (52 percent). Despite this projected increase, the total annual mortality will still be substantially less than the non-trawl allocation amounts (Table B-35). For 2015 and 2016, with a  $P^* = 0.45$ , the projected percent of the non-trawl allocation would be 6.9 percent and 7.3 percent, respectively. Under a  $P^* = 0.25$  scenario, the projected percent of the non-trawl allocation for 2015 and 2016 would be 9.4 percent and 9.8 percent, respectively.

### **Biological Impacts Under Option 2a**

Because the stock is considered very healthy, the 46.2 mt increase will have a relatively minor effect on the stock's status. Lingcod mortality is expected to increase, though encounter rates are not, as participants in the fishery will retain some lingcod encountered (at 100 percent mortality) rather than discard all lingcod encountered (with an estimated 7 percent mortality). For example, the increased trip limit during the open season is not expected to change fishing behavior (i.e., fishing effort or fishing area). Likewise, allowing retention during December-April at the amounts shown in Table B-33 is not expected to cause increased fishing effort or change in fishing locations (see [Agenda Item C.4.b, REVISED GMT Report](#), April 2014; pages 52-63). Hence, there would be no expected increase in lingcod encounter rates under this option relative to the No Action Option.

#### *Projected Overfished Species Mortality Under Option 2a*

With the combination of higher trip limits for the traditional fishing periods coupled with the modest trip limits for the periods that before were closed, projected mortality for canary rockfish is expected to increase. Under the No Action Option 1a, the projected canary rockfish mortality is 6.5 mt (Table B-37), whereas under Option 2a that mortality amount would be 6.7 mt. This projected canary rockfish mortality would equal the Preferred Alternative nearshore allocation of 6.7 mt in 2015 and not exceed the 6.9 mt in 2016 but would exceed the No Action mortality estimate (6.5 mt). Yelloweye rockfish mortality under Option 2a is 1.2 mt, which is the same as shown under Option 1b and equal to the Preferred Alternative nearshore allocation for 2015, but 0.1 mt higher than expected under No Action (1a).

### **Stock Status**

Under Option 2a, no adverse changes to lingcod stock status are expected compared to the No Action Option since lingcod mortality has been far below the non-trawl allocation and is expected to remain so under Option 2a. Estimated lingcod mortality under this option is expected to range between 7.8 percent and 11.0 percent of the non-trawl allocation (Table B-35). Given This level of increase in mortality is far below levels that would result in overfishing and are not expected to adversely affect stock status.

### **Socioeconomic Impacts Under Option 2a**

Allowing fishery participants to retain incidentally encountered lingcod that were previously discarded would increase revenue from current operations targeting other species within incidental lingcod encounters. In 2013, the average price per pound coast wide averaged \$2.50 per pound. This amount, applied to the projected increase (approximately 102,000 lb) would result in a coastwide gross estimated ex-vessel increase of approximately \$255,000. While low trip limits make it unlikely that fishery participants will choose to target lingcod, such targeting may become worthwhile if the price per pound makes the trip profitable, despite the relatively low trip limits. If trip limits cannot be attained or if fuel or other variable costs make it unprofitable, or alternatively opportunity costs are too high to justify changing targets, directed effort may not be economically viable and trips targeting lingcod may be unlikely. However, it needs to be pointed out that some vessels do target lingcod on some trips, so any increase would benefit these participants.

#### *Option 2b*

The intent of Option 2b is also to allow retention and landings of lingcod that would otherwise be discarded during the closed season, in addition to increasing trip limits during the currently open season. Under this option north of 40°10' N. latitude the LE sector would have a 200 pound trip limit per 2 months periods 1 and 2 and 200 lb for December (the same as for Option 2a). However, this sector would also have a 1,600 pound trip limit for periods 3 through 5 and 800 lb in November. For the OA sector north of 40°10' N. latitude, the monthly trip limit would be 100 lb during periods 1 and 2 and 100 lb in December, but the sector would have an 800 pound monthly trip limit for periods 3 through 5 and November. For the OA sector south of 40°10' N. latitude, a 100 lb per month trip limit would apply for period 1 and for December. All the other months would continue to have a 400 lb per month trip limit. Again, as per Option 2a, south of 40°10' N. latitude, the retention of lingcod would be prohibited for both the LE and OA sectors during March and April to prevent the possibility of additional mortality of overfished rockfish as well as discarding of other healthy rockfish species while targeting lingcod. See Table B-33 for a summary of trip limit details.

### **Fishing Activity Under Option 2b**

With larger trip limits compared to the No Action (Option 1a) and Option 2a, it is reasonable to expect an increase in overall annual lingcod mortality. Compared to the projection for the No Action Option (88.9 mt), the projected mortality would be 173.4 mt for Option 2b, an increase of 84.5 mt. Despite this projected increase, the total annual mortality will be substantially less than the non-trawl allocation amounts (Table B-35). For 2015 and 2016, with a  $P^* = 0.45$ , the projected percent of the non-trawl allocation would be 8.9 percent and 9.3 percent, respectively. Under a  $P^* = 0.25$  scenario, the projected percent of the non-trawl allocation for 2015 and 2016 would be 12.0 percent and 12.6 percent, respectively. This assumes that no new OA participants would enter the fishery. However, given that this trip limit option would provide a modest increase to potential OA participants, it is reasonable to assume that an increase in the number of participants could occur.

### **Biological Impacts Under Option 2b**

Because the stock is considered healthy, the 84.5 mt increase compared to the No Action Option will have a relatively minor effect on the stock's status. Lingcod mortality is expected to increase as participants in the fishery will retain some lingcod encountered (at 100 percent mortality) rather than discard all lingcod encountered (with an estimated 7 percent mortality), as occurs now during the closed season. There may be an increase in lingcod encounter rates under this option relative to the No Action Option, because trip limits during the currently open season would double (Table B-33). The likelihood and impact of this potential increase in effort would be very difficult to quantify. Despite this, however, it is probable that additional sets during a trip may occur to target lingcod (after catching trip limits for other species). This could increase impacts to OFS, as well as China rockfish.

### **Projected Overfished Species Mortality Under Option 2b**

With the combination of higher trip limits for the traditional fishing periods coupled with the modest trip limits for those periods that before were closed, projected mortality for canary is expected to increase. Under Option 1c, the projected canary rockfish mortality is 6.7 mt (Table B-37), whereas under Option 2b that projected mortality amount would also be 6.8 mt. This projected canary mortality is 0.3 mt higher than shown under No Action (Table B-37) and 0.4 mt higher than the Preferred Alternative allocation. For yelloweye rockfish, the projected mortality under this option will be 1.3 mt, whereas it is 1.2 mt for Option 2a. This projected yelloweye mortality is 0.2 mt higher than shown under No Action, exceeds the Preferred Alternative nearshore allocation for 2015 by 0.1, and equals the Preferred Alternative nearshore allocation for 2016.

### **Stock Status**

Under Option 2b, no changes to lingcod stock status are expected compared to the No Action Option since lingcod mortality has been far below the non-trawl allocation and expected to remain so under Option 2b. Estimated lingcod mortality under this option is expected to range between 10.1 percent and 14.3 percent of the non-trawl allocation (Table B-35). Given the projected increase in mortality that is projected to occur, the level of increase is still expected to be far below levels that would result in overfishing and are not expected to adversely affect stock status.

### **Socioeconomic Impacts Under Option 2b**

Allowing fishery participants to retain more lingcod (some of which were incidentally caught and discarded under status quo) would increase revenue from current operations targeting other species within incidental lingcod encounters. This may also increase revenue by incentivizing increased targeting or change in behavior during the May-November period when trip limits double relative to No Action (Table B-33). In 2013, the average price per pound coast wide averaged \$2.50 per pound. This amount, applied to the projected total (approximately 186,000 lbs.) compared to the No Action Option total would result in a coastwide gross estimated ex-vessel amount of approximately \$465,000 more than the No Action Option total. While moderate trip limits make it feasible that fishery participants will choose to target lingcod, such targeting may become more worthwhile if an increase in the overall average price per pound makes the trip profitable. It is speculated that if trip limits cannot be attained or if fuel or other variable costs make it unprofitable, or alternatively opportunity costs are too high to justify changing targets, directed effort may not be economically viable and trips targeting lingcod could be unlikely.

## **B.8 Non-Trawl: Allow Lingcod retention in Periods 1, 2, and 6**

### **Need for Action**

Lingcod retention is prohibited in Periods 1, 2, and part of 6 for both limited entry and open access fixed gears under the status quo regulations. In recent years, lingcod mortality has been far below the ACL north and south of 42° N. latitude with 25 percent and 13 percent attainment in 2011 and 34 percent and 16 percent in 2012, respectively. Public testimony at the September 2013 Council meeting requesting some level of retention during periods 1, 2, and 6. The request was made to land lingcod that are incidentally caught and discarded, with the suggestion that trip limits might be set low enough to prevent changes in fishermen's behavior (i.e., prevent targeting). Higher trip limits than those needed to allow for incidental take may further increase attainment of the non-trawl allocation of the ACL, but bycatch of overfished species while targeting lingcod is a consideration. The proposed change would allow lingcod retention in the restricted access state permitted nearshore fishery in California and Oregon, the open access nearshore fishery in Oregon, and the limited-entry and open access non-nearshore fixed gear fisheries in California, Oregon and Washington.

### **Background**

The prohibition on retention of lingcod during specific periods has been in effect for commercial fixed gear fisheries since the 1990s to improve the conservation of lingcod after being declared overfished. The closure was put in place to minimize impacts on lingcod during their spawning season, which is from December to April (Hamel et al. 2009). Females move in to depths shallower than 50 fm to spawn and males guard nests from predation. Although females do not spend much time in the spawning area, males are concentrated in these shallow waters guarding the eggs during winter and spring months (Love 1996). The season closure for the fixed gear fishery was presumably designed to reduce catch of these males while concentrated during the nest-guarding season to facilitate rebuilding of the stock.

Lingcod was declared rebuilt in 2009, when the status was determined to be 61.9 percent for the northern component and 73.7 percent for the southern component. The coastwide status was 67.0 percent at the beginning of 2009, well above the 40 percent target spawning stock biomass (Hamel *et al.* 2009). As a

## LINGCOD BAG LIMIT ANALYSIS

### Background:

For 2013-2014 recreational groundfish fisheries, lingcod have been managed within a non-trawl allocation of 1186 mt in 2014; lingcod does not have a recreational harvest guideline specified in regulation. In recent years mortality of lingcod south of 42° N. latitude has been far below the non-trawl allocation. In 2012, approximately 27 percent (314 mt) of the allocation was attained. Within the non-trawl sector, the recreational fishery comprised approximately 24 percent of the total mortality in 2012. Total mortality reports from the West Coast Groundfish Observer Program indicate that the majority of mortality in the non-trawl sector is attributed to the recreational fishery (Table 1).

Currently lingcod are subject to a two fish bag limit; other recreational management measures include the same season and depth restrictions as many other groundfish, as well as a minimum size limit of 22 inches. The current size limit was implemented in 2012 and access to higher lingcod abundance in deeper waters has been limited due to the need to protect overfished species. As a result, few management measures are available to increase the harvest of lingcod.

Table 1. Total mortality (in metric tons) of lingcod south of 42° N. latitude in the non-trawl sectors, 2009-2012 (source: West Coast Groundfish Total Mortality Reports).

Year	Commercial (non-Trawl)	Recreational	Total non-Trawl
2009	37.7	129.6	167.3
2010	26.8	94.6	121.4
2011	29.8	225.2	255.0
2012	33.0	281.4	314.4

### 2015-2016 Management Considerations:

Lingcod south of 42° N. latitude is a healthy stock which has been underutilized in recent years. Utilization of the stock has been limited somewhat by restrictive depth constraints and season structures implemented to protect overfished stocks. In order to more fully utilize the non-trawl lingcod allocation, the Council requested analysis of increasing the lingcod bag limit from two fish to a three fish bag limit.

### **Range of Management Options for Consideration**

#### **Option 1- No Action: Maintain current two fish bag limit for lingcod**

Under Option 1, the lingcod bag limit would remain two fish. Anglers will be forced to discard lingcod in excess of the bag limit, increasing the likelihood of encounters with overfished species.

#### Biological Impacts Under Option 1

##### *Projected Impacts*

Under Option 1, the projected mortality to lingcod in the recreational fishery under a two fish bag limit is 244.4 mt. Table 2 summarizes projected mortality to all overfished species.

Table 2. Projected mortality to overfished species under No Action.

Species	Projected Mortality (mt)
Bocaccio	100.1
Canary Rockfish	16.3
Cowcod	1.0
Yelloweye Rockfish	1.7

#### *Stock Status*

The stock was declared rebuilt in 2005 (Jagiello and Wallace, 2005) and the recent assessment indicates the stock remains above target biomass, with increasing abundance (Hamel et. al. 2009). Under Option 1, no change to stock status is expected.

#### **Option 2: Increase the bag limit from two to three fish**

Under Option 2, the lingcod bag limit would be increased statewide from two to three fish.

RecFIN data from 2011 to 2012 were used to analyze lingcod mortality as a result of increasing the bag limit. Using the RecFIN Hypothetical Bag Limit Analysis tool, estimates of increased mortality were calculated using A+B1+B2 fish. For the purpose of this analysis, A fish include sampled dead fish, B1 fish includes both fillets and fish discarded dead, and B2 fish includes mainly live discarded fish in excess of bag limits or undersized fish. Since the bag analysis tool does not estimate the proportion of fish that were undersized, this analysis assumes that all discarded fish were of legal size, biasing mortality estimates high. As the most conservative estimate, the analysis also assumes that all B2 fish would be available if the bag limit were increased.

#### **Biological Impacts Under Option 2**

##### *Projected Impacts*

Under Option 2, projected mortality to lingcod is expected to increase by approximately 20 percent (399.7 mt) under a three fish bag limit and PPA season structure<sup>1</sup>. The increase in projected mortality (155.3 mt) as a result of Option 2 can be accommodated within the non-trawl allocation, especially given historically low attainment.

Additional changes to management measures related to lingcod in the non-trawl sector are also being considered – specifically modifications to the spawning closure for the commercial non-trawl sectors. The cumulative mortality of both proposed changes is not expected to exceed the non-trawl allocation let alone the ACL.

##### *Impacts on Overfished Species*

Table 3 summarizes mortality of overfished species under Option 2. If anglers spend more time on the water fishing for an additional lingcod, the number of encounters with overfished species may increase, although any increase is difficult to quantify. While some increase in overfished species mortality can be expected over Option 1, sufficient buffer is available to accommodate the increased impacts (if realized) without exceeding the respective recreational HGs or the non-trawl allocation for cowcod.

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<sup>1</sup> The PPA season structure corresponds to Alternative 1 (Option1).

Table 3. California recreational projected mortality of overfished species for 2015-2016 under Option 2.

<b>Species</b>	<b>Projected Mortality (mt)</b>
Bocaccio	117.5
Canary Rockfish	26.7
Cowcod	1.2
Yelloweye Rockfish	2.9

*Stock status*

Under Option 2, no change to stock status is expected compared to Option 1.

*Socioeconomic Impacts*

Increasing the lingcod bag limit would provide anglers with increased opportunity, which may encourage anglers to take more trips. As a result, coastal communities and business that support recreational fishing could experience minor increases to revenue compared to No Action, though such increases are difficult to quantify or attribute solely to the increased bag limit.