

**2017-2018 GROUND FISH HARVEST
SPECIFICATIONS AND MANAGEMENT
MEASURES INCLUDING CHANGES TO
GROUND FISH STOCK DESIGNATIONS
(AMENDMENT 27 TO THE PACIFIC COAST
GROUND FISH FISHERY MANAGEMENT PLAN)**

**DESCRIPTION AND ANALYSIS FOR COUNCIL
DECISION-MAKING**

**Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220**

April 2016

Table of Contents

1. INTRODUCTION	11
1.1 Purpose of this Document	11
1.1 Proposed Actions, Purpose, and Need	11
1.1.1 The Proposed Actions	11
1.1.1.1 Amend the PCGFMP to Achieve Purposes Related to Achieving ACLs	12
1.1.2 Purpose of and Need for the Proposed Actions	12
1.1.2.1 Harvest Specifications and Management Measures	12
1.1.2.2 Amend the PCGFMP to Achieve Purposes Related to Achieving ACLs	12
1.2 The Fishery Management Area	12
2. HARVEST SPECIFICATIONS AND STOCK STATUS	15
2.1 Description of the Harvest Specifications Alternatives	15
2.1.1 No Action Alternative	15
2.1.2 Alternative 1	22
2.1.3 Alternative 2	22
2.1.4 Preferred Alternative	23
2.2 Stock-Specific Impacts of Alternative Harvest Specifications	23
2.2.1 Darkblotched Rockfish Impacts	23
2.2.2 Big Skate Impacts	24
2.2.3 California Black Rockfish Impacts	25
2.2.4 California Scorpionfish Impacts	27
2.2.5 Canary Rockfish Impacts	28
2.2.6 Widow Rockfish Impacts	33
2.2.7 Summary of the Impacts of the Harvest Specifications Alternatives to Groundfish Stocks	35
3. NEW MANAGEMENT MEASURES	39
4. INTEGRATED ALTERNATIVES	41
4.1.1 No Action	41
4.1.1.1 Deductions from the ACL and Allocations	41
4.1.1.2 Harvest Guidelines and Other Allocations	51
4.1.1.3 Shorebased Individual Fishing Quota (IFQ) – No Action	54
4.1.1.4 At-Sea Whiting Co-ops – No Action	60
4.1.1.5 Limited Entry and Open Access Fixed Gear Management – No Action	64
4.1.1.6 Tribal Fisheries – No Action	92
4.1.1.7 Washington Recreational – No Action	93
4.1.1.8 Oregon Recreational – No Action	101

4.1.1.9	California Recreational – No Action.....	108
4.1.2	Alternative 1.....	119
4.1.2.1	Harvest Guidelines and Other Allocations.....	126
4.1.2.2	Overview of Management Measures	126
4.1.2.3	Shorebased IFQ – Alternative 1	127
4.1.2.4	At-Sea Whiting Co-ops – Alternative 1	131
4.1.2.5	Limited Entry and Open Access Fixed Gear– Alternative 1.....	132
	Non-Nearshore	132
	Nearshore – Alternative 1	133
4.1.2.6	Tribal Fisheries – Alternative 1.....	133
4.1.2.7	Washington Recreational – Alternative 1	133
4.1.2.8	Oregon Recreational – Alternative 1.....	133
4.1.2.9	California Recreational – Alternative 1	134
4.1.3	Alternative 2.....	134
4.1.3.1	Harvest Guidelines and Other Allocations.....	141
4.1.3.2	Overview of Management Measures	141
4.1.3.3	Shorebased IFQ – Alternative 2.....	142
4.1.3.4	At-Sea Whiting Co-ops – Alternative 2	145
4.1.3.5	Limited Entry and Open Access Fixed Gear– Alternative 2.....	145
	Non-Nearshore – Alternative 2	145
	Nearshore – Alternative 2	145
4.1.3.6	Tribal Fisheries – Alternative 2.....	146
4.1.3.7	Washington Recreational – Alternative 2	146
4.1.3.8	Oregon Recreational – Alternative 2.....	146
4.1.3.9	California Recreational – Alternative 2	147
4.1.4	Summary of Groundfish Mortality under the Alternatives	147
4.2	Short-Term Socioeconomic Impacts of the Integrated Alternatives.....	148
4.2.1	Change in Ex-Vessel Revenue and Angler Trips.....	148
4.2.1.1	Commercial Fisheries	148
4.2.1.2	Recreational Fisheries	152
4.2.2	Cost and Net Revenue Estimates	157
4.2.3	Communities: Change in Income and Employment Impacts by Community.....	160
4.2.3.1	Income Impacts	160
4.2.3.2	Employment Impacts	166
4.2.3.3	Other Impacts	171
4.2.3.4	Impact Summary	171

5. CUMULATIVE EFFECTS	175
5.1 Scope of Cumulative Effects.....	175
5.2 Effects of Past, Present, and Reasonably Foreseeable Future Actions Other than the Proposed Actions	175
5.2.1 Fishery-Related.....	175
5.2.2 Not Fishery-Related.....	176
5.2.3 Summary of Effects of Past, Present, and Reasonably Foreseeable Future Actions not Identified in the 2015 EIS	177
6. CONSISTENCY OF THE PROPOSED ACTIONS WITH THE MAGNUSON-STEVENS ACT 10 NATIONAL STANDARDS FOR FISHERY CONSERVATION AND MANAGEMENT.....	183
7. CONSISTENCY OF THE PROPOSED ACTIONS WITH OTHER APPLICABLE MSA PROVISIONS	189
8. LITERATURE CITED.....	191

Tables

Table 2-1. 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for west coast groundfish stocks and stock complexes under default harvest control rules (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics; stocks without preferred harvest specifications decided with a range of alternatives for analysis are highlighted).....	17
Table 2-2. Alternative 1 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for select west coast groundfish stocks (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in status quo stock complexes in italics).....	22
Table 2-3. Alternative 2 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for select west coast groundfish stocks (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in status quo stock complexes in italics).....	22
Table 2-4. 2010-2015 total mortality (mt) of big skate by sector in west coast fisheries.	25
Table 2-5. Harvest projection in mt of OFLs and ACLs, summary biomass (age-3 and older), spawning output, and depletion for the California black rockfish base case model projected with total projected catch equal to the 420 mt HG for 2015 and 2016.....	26
Table 2-6. Estimated total mortality and depletion of California scorpionfish with projected 2017-2026 harvest specifications based on the default harvest control rule and expected total mortality after 2014. .	28
Table 2-7. Projected spawning biomass and depletion of canary rockfish under the low state of nature and base models in the 2015 assessment assuming removals under default harvest control rules.....	29
Table 2-8. Projected harvest specifications, spawning biomass and depletion under the alternatives analyzed for canary rockfish using the base case model in the 2015 assessment.	31
Table 2-9. Projected spawning biomass and depletion of widow rockfish under the low state of nature and base models in the 2015 assessment assuming removals under alternative harvest control rules.	34
Table 2-10. Comparison of alternative harvest specifications. (No Action default specifications proposed for all other stocks under all three alternatives.).....	36
Table 3-1. New Management Measures under Consideration for Implementation in 2017-2018.....	40
Table 4-1. No Action Alternative. Estimates of tribal, EFP, research (Res.), and incidental OA groundfish mortality in metric tons, used to calculate the fishery HG in 2017.....	44
Table 4-2. No Action Alternative. Stock-specific fishery HGs or ACTs and allocations for 2017 (in mt).45	

Table 4-3. No Action Alternative. Estimates of tribal, EFP, research (Res.), and incidental OA groundfish mortality in metric tons, used to calculate the fishery HG in 2018.....	46
Table 4-4. No Action Alternative. Stock specific fishery HGs or ACTs and allocations for 2018 (in mt).	47
Table 4-5. No Action Alternative. Estimates of tribal, research, recreational (Rec), and EFP mortality (in mt), used to calculate the fishery sablefish commercial harvest guideline north of 36° N. latitude for 2017 and 2018.....	48
Table 4-6. No Action: Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.....	49
Table 4-7. No Action Allocations, HGs, and shares of Canary Rockfish.....	52
Table 4-8. Range of Nearshore Rockfish north of 40° 10' N. latitude HGs.....	53
Table 4-9. Harvest Guidelines and Annual Catch Targets for 2017-2018.....	54
Table 4-10. No Action – Shorebased IFQ. Projected mortality for IFQ species and Pacific halibut IBQ under No Action (2017 values), compared to the allocations or set-asides. Year-end estimates of mortality for 2013 and 2014 are provided for reference (right panel).....	57
Table 4-11. No Action – Shorebased IFQ. Projected mortality for IFQ species and Pacific halibut IBQ under No Action (2018 values), compared to the allocations or set-asides. Year-end estimates of mortality for 2013 and 2014 are provided for reference (.....	58
Table 4-12. Recent mortality estimates for non-IFQ stocks in the shorebased IFQ fishery (mt).	59
Table 4-13. Big skate trip limits coastwide for shorebased IFQ fishery for 2017-2018.....	59
Table 4-14. Trawl RCA configuration in regulation as of February 3, 2016.....	59
Table 4-15. Non-Trawl RCA configuration in regulation as of February 3, 2016.	60
Table 4-16. No Action – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under the No Action Alternative for 2017-2018. Historical mortality for 2013 and 2014 by sector is provided (right panel) for reference.	62
Table 4-17: No Action- At-Sea. Projections for the CP and MS sectors under the No Action Alternative for 2017-2018 using average historical bycatch rates (positively weighted for more recent years). No Action allocations are provided on the right for reference.	62
Table 4-18: No Action- At-Sea- Catcher-Processor. Landing projections for the CP sector under the No Action Alternative for 2017-2018 using the bootstrap methodology. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations.....	63
Table 4-19: No Action- At-Sea- Mothership. Projections for the MS sector under the No Action Alternative for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations.....	63
Table 4-20. No Action – At-Sea. At-sea whiting set-asides and allocations under the No Action Alternative (adopted by the Council in November 2015). Historical mortality for the catcher-processor (CP) and mothership sectors (MS) and the 2016 set-asides in regulations are provided for reference.....	64
Table 4-21. No Action – Limited Entry Fixed Gear. Summary of limited entry fixed gear fishery management measures under the No Action Alternative.....	66
Table 4-22. No Action – Open Access. Summary of open access fishery management measures under the No Action Alternative based on regulations.....	66
Table 4-23. No Action: Limited entry sablefish FMP allocations north of 36° N. latitude, based on the default harvest control rule.	69
Table 4-24. No Action: Open access FMP allocations north of 36° N. latitude, based on the default harvest control rule.....	69
Table 4-25. No Action: Short-term sablefish allocations south of 36° N. latitude for the non-trawl sector, limited entry and open access under no action sharing alternative (55 percent to limited entry; 25 percent to open access) and alternative sharing of 75 percent to limited entry; 25 percent to open access.	69
Table 4-26. No Action . Sablefish trip limits (lbs) north of 36° N. latitude for limited entry and open access fixed gears.....	69
Table 4-27. No Action . Sablefish trip limits (lbs) south of 36° N. latitude for limited entry and open access fixed gears with informal share noted in parenthesis.....	70

Table 4-28. No Action: Blackgill rockfish trip limits, south of 40° 10' N. latitude for 2017 and 2018 for non-trawl fixed gear sectors.....	71
Table 4-29. Total mortality (mt) of yellowtail rockfish in the non-trawl sector north of 40°10' N. latitude, 2011-2014. (data sources: WCGOP)	72
Table 4-30. Summary of Limited Entry and Open Access monthly trip limits (in lbs) and projected impacts (mt) for non-trawl yellowtail rockfish north of 40°10' N. latitude. Also included is the average recreational mortality from 2011-2014 as a proxy for the projection.....	72
Table 4-31. No Action bi-monthly trip limits options (pounds) for the Shelf Rockfish complex between 40°10' and 34°27' N. latitude for the open access sector and overall non-trawl impacts (mt).....	73
Table 4-32. No Action limited entry trip limits (in pounds) for bocaccio south of 40°10' N. latitude.	75
Table 4-33. No Action open access trip limits (in pounds) for bocaccio south of 40° 10' N. latitude.....	75
Table 4-34. Bocaccio bi-monthly trip limits (in pounds) for the LE sector for the two regions of California south of 40° 10' N. latitude and estimated mortality (mt).	75
Table 4-35. Bocaccio bi-monthly trip limits (in pounds) for the OA sector for the two regions of California south of 40°10' N. latitude and estimated mortality (mt).	76
Table 4-36. Summary mortality estimates (mt) for bocaccio rockfish by sector and area compared to the 2018 non-trawl commercial LE and OA allocation.	76
Table 4-37. Comparison of actual vs. projected mortality of yelloweye rockfish in the non-nearshore. ...	78
Table 4-38. No Action – Non-Nearshore fishery: Overfished species shares for the non-nearshore fixed gear fishery under No Action (mt), based on Default Harvest Control Rule.....	78
Table 4-39. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. latitude (in mt) for 2017 compared to the non-trawl allocation.	79
Table 4-40. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. latitude (in mt) for 2018 compared to the non-trawl allocation.	80
Table 4-41. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries south of 36° N. latitude (in mt) for 2017/2018 compared to the non-trawl allocation.	82
Table 4-42. No Action. Non-Trawl Allocations, Nearshore Shares, and State Shares under No Action.	83
Table 4-43. No Action. Expected landings under the No Action Alternative, which are the average landings for the commercial nearshore fishery from 2010-2014 unless noted. Target species landings by area are also shown in the far right panel. The 2017 quotas (or HGs) for Oregon are provided in parenthesis. Quotas for Oregon are the state partition of Federal allocations to the Oregon “commercial nearshore fishery,” with the remainder to the Oregon sport fisheries.	84
Table 4-44. Annual landings and averages for nearshore species from 2010-2014.....	85
Table 4-45. No Action - Nearshore. Projected overfished species (OFS) mortality (mt) compared to the overfished species shares for 2017-2018 (mt).	86
Table 4-46. Allocations of nearshore rockfish north of 40° 10' N. to Oregon and California nearshore fisheries for the three allocation alternatives, projected landings for blue rockfish species and the other nearshore rockfish, and total mortality of yelloweye rockfish. All other impacts are the same as in Table 4-42. Allocations for Oregon are not Federal allocations, rather the presumptive state allocations of the Oregon Federal HG to the “Oregon commercial nearshore fishery.”	87
Table 4-47. Projected impacts to canary rockfish in the nearshore fishery for open access trip limits ranging from 0-300 lbs per period and with LE fixed at 300 lbs for all (except non-retention). Open access trip limits assume 14 percent targeting, based on historical practices.....	89
Table 4-48. 2016 bi-monthly cumulative trip limits (in lbs) for limited entry and open access fixed-gear black rockfish north of 40° 10' N. latitude.....	89
Table 4-49. Commercial black rockfish landings (mt) in California north of 40° 10' N. latitude from 2005 to 2015 by the limited entry and open access fixed-gear sector. Note that the 2015 landings total is a preliminary projection.....	90
Table 4-50. Summary of black rockfish bi-monthly trip limits (in pounds) for the limited entry and open access fixed-gear sectors north of 40°10' N. latitude and corresponding projected mortality impacts (mt).	90

Table 4-51. Summary of limited entry and open access bi-monthly trip limits (in pounds) for California scorpionfish in 2016.....	91
Table 4-52. Summary of limited entry and open access bi-monthly trip limits (in lbs) and projected impacts (mt) for California scorpionfish south of 34° 27' N. latitude.....	91
Table 4-53. The No Action : Tribal fishery based on current regulations and those proposed for 2017-2018.	92
Table 4-54. No Action – Washington Recreational. Harvest guidelines (HG) for the Washington recreational fisheries under the No Action Alternative.....	94
Table 4-55. No Action. Status Quo Washington Recreational Seasons and Groundfish Retention Restrictions.	96
Table 4-56. No Action. Option 1 Washington Recreational Seasons and Groundfish Retention Restrictions, which includes a bottomfish closure from October 16 through March 14.....	96
Table 4-57. No Action – Washington Recreational. Projected mortality under the No Action Alternative, including bag limit Options 1 and 2.	101
Table 4-58. No Action. Oregon recreational Federal harvest guidelines (HG) or state quotas under the No Action Alternative (mt).....	102
Table 4-59. Coordinates for the Stonewall Bank currently as specified in regulation, for the expanding the Stonewall Bank area closure under.....	103
Table 4-60. No Action – Oregon Recreational. Projected Mortality (mt) of species with Oregon recreational specific allocations under the No-Action Alternative.....	107
Table 4-61. No Action – Oregon Recreational. Recent mortality (mt) of the ten most landed species in the Oregon recreational fishery under the season structure, bag limits, area restrictions, etc. in the No-Action Alternative.....	107
Table 4-62. No Action – California Recreational: Overfished species allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries under No Action in 2017 and 2018 as in the 2016 in the 2015-2016 FEIS.	108
Table 4-63. California Recreational Season Structure Option 1: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.	115
Table 4-64. California Recreational Season Structure Option 2: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.	116
Table 4-65. California Recreational Season Structure Option 3: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.	117
Table 4-66. California Recreational Season Structure Option 4: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.	118
Table 4-67. Total mortality of petrale sole in the California recreational fishery, 2011-2014 from WCGOP Total Mortality Report.	118
Table 4-68. Alternative 1. 2017 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other ACL values are the same as under No Action.	120
Table 4-69. Alternative 1. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt). All other values are the same as under No Action.	121

Table 4-70. Alternative 1. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other values are the same as under No Action.	122
Table 4-71. Alternative 1. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt). All other values are the same as under No Action.	123
Table 4-72. Alternative 1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.....	124
Table 4-73. Alternative 1 Allocations, HGs, and shares of Canary Rockfish.....	126
Table 4-74. Alternative 1 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 1 for 2017 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).	129
Table 4-75. Alternative 1 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 1 for 2018 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).	130
Table 4-76. Alternative 1 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 1. The No Action allocations are provided (right panel) for reference.....	131
Table 4-77: Alternative 1- At-Sea- Catcher Processor. Projections for the CP sector under Alternative 1 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. Alternative 1 allocations for 2017 are provided on the right for reference.....	132
Table 4-78: Alternative 1- At-Sea- Mothership. Projections for the MS sector under Alternative 1 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. Alternative 1 allocations for 2017 are provided on the right for reference. Bolded text indicates values that are higher than the allocations.....	132
Table 4-79. Alternative 1: Washington recreational HGs for 2017 and 2018.	133
Table 4-80. Oregon recreational Federal HGs (in mt) and state quotas under the Alternative 1 for 2017-2018.	134
Table 4-81. Alternative 2. 2017 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other ACL values are the same as under No Action.	135
Table 4-82. Alternative 2. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt). All other values are the same as under No Action.	136
Table 4-83. Alternative 2. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other values are the same as under No Action.	137
Table 4-84. Alternative 2. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt). All other values are the same as under No Action.	138
Table 4-85. Alternative 2. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.....	139
Table 4-86. Alternative 1 Allocations, HGs, and shares of Canary Rockfish.....	141
Table 4-87. Alternative 2 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 2. The No Action allocations are provided (right panel) for reference.....	145
Table 4-88. Alternative 2: Washington recreational HGs for 2017 and 2018.	146
Table 4-89. Oregon recreational Federal HGs (in mt) and state quotas under the Alternative 2 for 2017-2018.	147
Table 4-90. Estimated ex-vessel revenues by groundfish harvest sector under the alternatives (2015 \$million).....	149
Table 4-91. Change in groundfish ex-vessel revenues from the No Action Alternative by groundfish harvest sector under the action alternatives (2015 \$million).....	149
Table 4-92. Change in groundfish ex-vessel revenues from the No Action Alternative by shoreside harvest sector under the action alternatives (percent).....	150

Table 4-93. Groundfish ex-vessel revenues under the Baseline (5-year 2011 to 2015 inflation-adjusted average annual ex-vessel revenue) and 2017-18 Alternatives by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (2015 \$million).	151
Table 4-94. Change in groundfish ex-vessel revenues from the Baseline (5-year 2011 to 2015 inflation-adjusted average annual ex-vessel revenue) by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (2015 \$million).	151
Table 4-95. Change in groundfish ex-vessel revenues from the Baseline (5 year 2011–2015 inflation-adjusted average annual ex-vessel revenue) by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (percent).	151
Table 4-96. Estimated Recreational Effort (halibut+bottomfish) under the Baseline and 2017-18 Alternatives (thousands of angler trips).	154
Table 4-97. Estimated change from Baseline Recreational Effort (halibut+bottomfish) under the 2017-18 Alternatives (thousands of angler trips).	155
Table 4-98. Estimated change from Baseline Recreational Effort (halibut+bottomfish) under the 2017-18 Alternatives (percent).	156
Table 4-99. Estimates of ex-vessel revenue (output from Landings Distribution Model), variable cost net revenue (ex-vessel revenue net variable costs), and total cost net revenue (ex-vessel revenue net variable costs and fixed costs) by fishery for the alternatives. Values in dollars and for total cost net revenue as a percentage of gross revenue.	158
Table 4-100. Estimates of costs by fishery for the alternatives.	159
Table 4-101. Commercial fishery income impacts under the alternatives by community group (\$mil) in 2017-2018. Estimates are presented as the average annual value for the two-year management period..	161
Table 4-102. Change in commercial fishery income impacts (from No Action Alternative) under the action alternatives by community group (\$mil) in 2017-2018. Estimates are presented as the average annual value for the two-year management period.	161
Table 4-103. Change in commercial fishery income impacts (from No Action Alternative) under the action alternatives by community group (percent).	162
Table 4-104. Recreational fishery income impacts of the alternatives and recreational management options by community group (\$1,000s).	163
Table 4-105. Change in recreational fishery income impacts from No Action under the action alternatives by community group (\$1,000s).	164
Table 4-106. Change in recreational fishery income impacts from No Action under the action alternatives by community group (percent).	165
Table 4-107. Commercial fishery employment impacts under the alternatives by community group (number of jobs).	166
Table 4-108. Change in commercial fishery employment impacts (from No Action Alternative) under the action alternatives by community group (number of jobs).	167
Table 4-109. Change in commercial fishery employment impacts (from No Action Alternative) under the action alternatives by community group (percent).	167
Table 4-110. Recreational fishery employment impacts under the alternatives and recreational management options by community group (number of jobs).	168
Table 4-111. Change in recreational fishery employment impacts from No Action under the action alternatives by community group (number of jobs).	169
Table 4-112. Change in recreational fishery employment impacts from No Action under the action alternatives by community group (percent).	170
Table 4-113. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under the No Action Alternative.	173
Table 4-114. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under Alternative 1 (California Options 1 and 3).	173
Table 4-115. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under Alternative 2 (California Options 1 and 3).	174

Table 5-1. Summary effects of past, present, and reasonably foreseeable future actions on the environmental components evaluated in the 2015-2016 Groundfish Harvest Specifications EIS (Table 4-234)..... 178

Table 5-2. Summary of the cumulative effects of the proposed actions in the 2015-2016 Groundfish Harvest Specifications EIS (Table 4 235). 179

Figures

Figure 1-1. The action area, showing major coastal communities and groundfish management areas. 14

Figure 2-1. Estimated relative spawning biomass (depletion) with approximate 95 percent asymptotic confidence intervals (filled area) for the base case widow rockfish assessment model. 33

Figure 4-1. No Action – Selected GCAs. a. The current Cowcod Conservation Areas located in the Southern California Bight; b. North Coast Area B, a Yelloweye Rockfish Conservation Area in northern Washington; c. South Coast Area A and B, Yelloweye Rockfish Conservation Areas in southern Washington. South Coast Area A is an area to be voluntarily avoided. 60

Figure 4-2. No Action. The current “C-shaped” Yelloweye Rockfish Conservation Area in waters off northern Washington where recreational groundfish and Pacific halibut fishing is prohibited. 68

Figure 4-3. No Action. Washington Recreational Management Areas..... 95

Figure 4-4. No Action Washington recreational area restrictions. a. C-Shaped YRCA; b. Washington South Coast and Westport YRCAs; c. Lingcod Restricted Area. 98

Figure 4-5. Oregon recreational groundfish season structure and bag limits under the No Action Alternative. 103

Figure 4-6. The Stonewall Bank Yelloweye Rockfish Conservation Area where recreational fishing for groundfish and Pacific halibut is prohibited with two options for expanding the closed area..... 104

Figure 4-7. California Recreational Management Areas. 109

Figure 4-8. Option 1: California recreational groundfish season structure assuming the same season structure as in 2016..... 110

Figure 4-9. Option 2: California recreational groundfish season structure with length and depth modifications north of Point Arena; 2016 season structure would remain in place south of Point Arena. 110

Figure 4-10. Option 3: California recreational groundfish season structure maintaining the 2016 season length, while liberalizing the 2016 depth restriction by 10 fm north of Point Conception..... 111

Figure 4-11. Option 4: California recreational groundfish season structure under an all depth fishery statewide. 111

1. Introduction

1.1 Purpose of this Document

[This document contains information to allow the Council to make informed decisions consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Administrative Procedures Act, National Environmental Policy Act (NEPA), and other applicable law. The information in this document may be used by National Marine Fisheries Service (NMFS) to prepare documents required by applicable law, including NEPA.]

[Information on baseline conditions—the affected environment—is contained in the Groundfish SAFE.]

1.1 Proposed Actions, Purpose, and Need

This document evaluates two actions related to periodic changes in the management of fisheries under the Pacific Coast Groundfish Fishery Management Plan (PCGFMP).

1.1.1 The Proposed Actions

1.1.1.1 Harvest Specifications and Management Measures

The proposed action is to implement harvest specifications and management measures for the 2017-2018 biennial period and beyond, and revise Federal regulations at 50 CFR 660, Subparts C through G accordingly. Using the “best available scientific information,” the Council considers harvest specifications every two years, including the overfishing limits (OFLs), acceptable biological catches (ABCs) and annual catch limits (ACLs) for groundfish stocks (and related management units¹), consistent with the policies and procedures the Council has established in the Pacific Coast Groundfish FMP (PCGFMP) for these actions and in compliance with applicable law.

The specification of catch limits must be consistent with requirements of the MSA, and particularly the 10 National Standards enumerated in §301(a) of the MSA and related advisory guidelines established pursuant to §301(b). The proposed action needs to be consistent with the optimum yield (OY) harvest management framework described in Chapter 4 of the PCGFMP, which complies with National Standard 1 guidelines (50 CFR 600.310). ACLs are amounts of fish catch that should not be exceeded in a year and must be set at a level that prevents overfishing, according to the best available science. For stocks whose biomass is below the MSY level, ACLs will be set appropriately to return stock biomass to that level. Adopted rebuilding plans need to be evaluated and adjusted, if appropriate, based on the most recent stock assessments for these stocks. ACLs must be set consistent with these rebuilding plans and MSA §304(e).

In the case of groundfish species designated as overfished or rebuilding,² harvest specifications are determined so that the stock will rebuild to the target biomass (B_{MSY} or proxy) by the target year (T_{TARGET}) specified in its rebuilding plan, if possible. As part of this biennial process the Council may revise rebuilding plans to meet the objective described in §304(e) of the MSA. This objective is to rebuild the stock in as short a time as possible, taking into account the status and biology of any overfished stocks of

¹ Management units are stocks occurring throughout the west coast EEZ (“coastwide”), geographic subdivisions of stocks in the EEZ, and geographically subdivided stock complexes composed of more than one managed species.

² According to the [2015 Second Quarter Update Summary of Stock Status for FSSI Stocks \(Table A\)](#) produced by NMFS Office of Sustainable Fisheries, three Pacific Coast groundfish stocks—canary rockfish, Pacific ocean perch, and yelloweye rockfish—are currently designated “overfished.” An additional three stocks—bocaccio, cowcod, and darkblotched rockfish—are designated as not overfished but “rebuilding.” All six stocks are currently managed under rebuilding plans.

fish, the needs of fishing communities, recommendations by international organization in which the United States participates, and the interaction of the stock of fish within the marine ecosystem. T_{TARGET} and the underlying harvest control rule are defined in both the rebuilding plan and regulation.³

Section 6.2 in the PCGFMP describes procedures for establishing management measures as part of the biennial management cycle. As part of this process new management measures may be established in regulations and classified as routine. Once classified as routine, management measures may be adjusted, and associated regulations revised, through an abbreviated rulemaking process.

1.1.1.1 Amend the PCGFMP to Achieve Purposes Related to Achieving ACLs

In addition to adopting harvest specifications and management measures, the proposed action is to amend the PCGFMP to change stock classifications and implement other management changes beyond the scope of the FMP framework for regulatory adjustments. To implement these changes the PCGFMP must be amended. These actions include:

- Categorize big skate (*Raja binoculata*) as a management unit species “in the fishery” (see 50 CFR § 600.310(d)). Currently big skate is described in the PCGFMP as an ecosystem component (EC) species. The PCGFMP must be amended to accomplish this change.
- Move starry flounder, currently managed separately, into Other Flatfish complex. This action would require changes to the Amendment 21 allocations for either the Other Flatfish complex or starry flounder.

1.1.2 Purpose of and Need for the Proposed Actions

1.1.2.1 Harvest Specifications and Management Measures

The purpose of this proposed action is to prevent overfishing, to rebuild overfished stocks, to ensure conservation, to facilitate long-term protection of essential fish habitat (EFH), and to realize the full potential of the Nation’s fishery resources (MSA §2(a)(6)).

This action is needed to regulate Pacific Coast groundfish fisheries in 2017-2018 so that annual catch limits are not exceeded and in a way that best achieves the purposes outlined above.

1.1.2.2 Amend the PCGFMP to Achieve Purposes Related to Achieving ACLs

The purpose of amending the FMP is to respond to the best available science on the classification of stocks, classify stocks in order to reflect catch patterns in the fishery, and implement measures that better balance conservation objectives and the needs of fishing communities but are outside the scope of the FMP framework for periodic regulatory changes. The action is needed so that the PCGFMP accurately reflects Council policy and remains consistent with the MSA.

1.2 The Fishery Management Area

Federally-managed Pacific groundfish fisheries occurring within the Exclusive Economic Zone (EEZ) off the coasts of Washington, Oregon, and California (WOC) establish the geographic context for the proposed action. West coast communities engaged in these fisheries are also part of the context

³ “Harvest control rule” means the methods adopted to determine harvest specifications, based on criteria in the MSA and Groundfish FMP. Harvest specifications are the numerical values determined by applying the harvest control rule (or harvest policy) to the best available scientific information about the status and characteristics of a stock or management unit.

(see Figure 1-1). Although this is the Federal fishery management area, the states manage the fisheries in the territorial sea to meet the goals and objectives of the Pacific Groundfish FMP.



Figure 1-1. The action area, showing major coastal communities and groundfish management areas.

2. Harvest Specifications and Stock Status

2.1 Description of the Harvest Specifications Alternatives

With the adoption of Amendment 24 to the PCGFMP in February 2015, the Council and NMFS established default harvest control rules (HCRs) that, unless modified by the Council, are used to establish biennial harvest specifications for stocks and stock complexes. Amendment 24 also added new stocks to the FMP and designated some FMP species as ecosystem component (EC) species. New harvest specifications for 2017 and 2018 based on default HCRs reflect the application of the best available science to current harvest management policies. The best available science encompasses new stock assessments, changes in SSC-endorsed stock categories, or changes in Scientific and Statistical Committee- (SSC) endorsed sigma values (i.e., biomass variances used to estimate the uncertainty in estimating OFLs). This information is used to determine the OFLs, ABCs, and ACLs for the 2017-2018 biennial management period and beyond. Once final harvest specifications are decided and adopted, the harvest control rules informing those specifications become the new default for the next biennial management cycle.

The Council is considering alternatives to the default harvest control rules for the following stocks:

- Darkblotched rockfish, although currently an overfished species managed under a rebuilding plan, is predicted to be rebuilt before new harvest specifications are implemented in 2017. An alternative HCR is considered in response to this predicted change in status.
- Big skate, currently designated as an EC species, is being considered for active management with its own HCR and harvest specifications.
- A change in the California black rockfish HCR is being considered based on information in a new stock assessment. The new HCR is projected to keep the stock above target biomass in the next ten years under a constant catch strategy.
- A change from the default HCR for California scorpionfish is being considered due to uncertainty in the stock assessment and to mitigate management risk.
- Canary rockfish status has changed to rebuilt based on new assessment results. More precautionary alternative HCRs are considered to mitigate management risk.
- Widow rockfish is currently managed under a constant catch HCR. An alternative HCR allowing higher harvest is considered.

2.1.1 No Action Alternative

The 2017 and 2018 harvest specifications under the No Action alternative are provided in Table 2-1. Harvest specifications based on default HCRs are considered “No Action,” because the Council has not departed from the current harvest management policies under the harvest specification framework described in Chapter 4 of the PCGFMP. Default harvest specifications reflect the application of the best available science to the default HCRs. The following aspects of No Action merit special attention:

- Stocks where the default HCR is applied but alternatives to No Action are being considered
- Stocks where default policies are applied but the HCR differs from that used for 2015-2016 harvest specifications

The reasons for changes in default HCRs within the scope of the PCGFMP policy framework and stock classifications are summarized below.

Big skate is currently designated as an EC species so there is no default HCR and related default harvest specifications for this stock. New information shows that it needs to be actively managed and thus classified as an FMP management unit species. As a managed species, it requires harvest specifications.

The default HCR for **black rockfish in California and Oregon** is a 1,000 mt annual catch unless new assessments or projections from the most recent assessments indicate the ABCs are less than 1,000 mt, which is the case based on the most recent stock assessment. In this case, the ACL equals the ABC with an overfishing probability (P^*) of 0.45. The long-term projections for black rockfish analyzed in the 2015-2016 harvest specifications and management measures Environmental Impact Statement (EIS) analyzed this harvest control rule for black rockfish. The OFLs and ABCs using new 2015 assessments of black rockfish in California and Oregon (Cope, *et al.* 2015) sum to less than 1,000 mt, so the default harvest control rule for both stocks described under the No Action alternative are $ACL = ABC$ ($P^* = 0.45$). The only difference in preferred management of black rockfish in California and Oregon in 2017 and beyond is to manage these stocks with state-specific harvest specifications rather than state-specific harvest guidelines under a shared ACL as was done from 2009-2016. Both stocks are projected to be above target biomass in 2017 and 2018.

Canary rockfish was managed under a rebuilding plan in 2015 and 2016 with the ACL based on a spawning potential ration (SPR) harvest rate of 88.7 percent. The new 2015 canary rockfish assessment (Thorson and Wetzel 2015) indicates the stock has rebuilt. When new science indicates a stock is newly rebuilt, the default harvest control rule under Amendment 24 is to manage the stock with the ACL equal to the ABC under the default P^* value. For canary rockfish, the default harvest control rule is $ACL = ABC$ ($P^* = 0.45$).

Starry flounder was managed with stock-specific harvest specifications in 2015-2016, but the Council is considering a new management measure that would manage starry flounder within the Other Flatfish complex beginning in 2017 (this decision will be made at the April (preliminary preferred) and June (final preferred) Council meetings). Since default harvest control rules were used to determine the harvest specifications of starry flounder, these are included under the No Action alternative. The 2017 and 2018 OFL is equal to the 2016 OFL since the 2005 assessment (Ralston 2006) is considered out of date.

Oregon kelp greenling and Washington kelp greenling, stocks managed in the Other Fish complex, did not have 2015 and 2016 harvest specification contributions since the SSC did not approve any of the proposed methodologies to determine OFLs for those stocks. The SSC endorsed a new Oregon kelp greenling stock assessment (Berger, *et al.* 2015) and a new depletion-based stock reduction analysis (DB-SRA) for Washington kelp greenling to inform 2017 and 2018 OFLs. The default HCR of $P^* = 0.45$ to inform ABCs for these stocks and an ACL control rule of $ACL = ABC$ is specified for these stocks. The updated harvest specification values then contribute to the specifications for the Other Fish complex.

The No Action specifications for stocks where the default HCR is the same as in 2015-2016 with additional alternative HCRs under consideration are described below.

The No Action ACL for **widow rockfish** is a constant catch ACL of 2,000 mt.

The No Action ACL for **California scorpionfish** is $ACL = ABC$ under a P^* of 0.45. The ACLs of 264 and 261 mt for 2017 and 2018, respectively, are over twice as large as the 111 mt 2016 ACL based on the catch-only update of the 2005 assessment (Maunder, *et al.* 2006) done in 2015.

Table 2-1. 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for west coast groundfish stocks and stock complexes under default harvest control rules (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in stock complexes in italics; stocks without preferred harvest specifications decided with a range of alternatives for analysis are highlighted).

Stock or Stock Complex	2017			2018			Default Harvest Control Rules
	OFL	ABC	ACL	OFL	ABC	ACL	
OVERFISHED STOCKS							
BOCACIO S. of 40°10'	2,139	2,044	790	2,013	1,924	741	ABC (P* = 0.45), ACL (SPR = 77.7%)
COWCOD S. of 40°10'	70	63	10	71	64	10	ABCs sum of Con. and Mont. area ABCs, ACLs projected from 2013 rebuilding analysis (SPR = 82.7% (F = 0.007)) + Mont. area ABC contrib., ACT = 4 mt
<i>COWCOD (Conception)</i>	58	53	NA	59	54	NA	<i>ABC (P* = 0.45)</i>
<i>COWCOD (Monterey)</i>	12	10	NA	12	10	NA	<i>ACL = ABC (P* = 0.45)</i>
DARKBLOTCHED ROCKFISH	671	641	406	693	663	419	ABC (P* = 0.45), ACL (SPR = 64.9%)
PACIFIC OCEAN PERCH	961	919	171	985	942	176	Updated projections from 2011 rebuilding analysis using actual catches from 2011-2014 and assumed ACL removals thereafter. ABC (P* = 0.45), ACL (SPR = 86.4%)
YELLOWEYE ROCKFISH	57	47	20	58	48	20	Catch-only update from the 2011 stock assessment assuming ACL removals; ABC (P* = 0.4), ACL (SPR = 76.0%)
NON-OVERFISHED STOCKS							
Arrowtooth Flounder	16,571	13,804	13,804	16,498	13,743	13,743	ACL = ABC (P* = 0.4)
Big skate	NA	NA	NA	NA	NA	NA	EC Species (i.e., no harvest control rules or specifications)
Black Rockfish (CA)	349	334	334	347	332	332	ACL = ABC (P* = 0.45)
Black Rockfish (OR)	577	527	527	570	520	520	ACL = ABC (P* = 0.45)
Black Rockfish (WA)	319	305	305	315	301	301	ACL = ABC (P* = 0.45)
Blackgill Rockfish S. of 40°10'	NA	NA	NA	146	133	123	ACL = ABC (P* = 0.45) w/ 40-10 adjustment. Managed in the Southern Slope Rockfish complex in 2017.
Cabezon (CA)	157	150	150	156	149	149	ACL = ABC (P* = 0.45) w/ 40-10 adjustment (ACL rounds to ABC)
Cabezon (OR)	49	47	47	49	47	47	ACL = ABC (P* = 0.45)
California scorpionfish	289	264	264	286	261	261	ACL = ABC (P* = 0.45)
Canary Rockfish	1,793	1,714	1,714	1,661	1,588	1,588	ACL = ABC (P* = 0.45)
Chilipepper S. of 40°10'	2,727	2,607	2,607	2,623	2,507	2,507	ACL = ABC (P* = 0.45)
Dover Sole	89,702	85,755	50,000	90,282	86,310	50,000	ABC (P* 0.45), ACL = 50,000 mt annually
English Sole	10,914	9,964	9,964	8,255	7,537	7,537	ACL = ABC (P* = 0.45)
Lingcod N. of 40°10'	3,549	3,333	3,333	3,310	3,110	3,110	ACL = ABC (P* = 0.45)
Lingcod S. of 40°10'	1,502	1,251	1,251	1,373	1,144	1,144	ACL = ABC (P* = 0.4)
Longnose skate	2,556	2,444	2,000	2,526	2,415	2,000	ABC (P* = 0.45), ACL = 2,000 mt annually
Longspine Thornyhead N. of 34°27'	4,571	3,808	2,894	4,339	3,614	2,747	ACL = 76% of coastwide ABC (P* = 0.4)
Longspine Thornyhead S. of 34°27'			914			867	ACL = 24% of coastwide ABC (P* = 0.4)
Pacific Cod	3,200	2,221	1,600	3,200	2,221	1,600	ABC (P* = 0.4), ACL = 50% of OFL
Petrale Sole	3,280	3,136	3,136	3,152	3,013	3,013	ACL = ABC (P* = 0.45)
Sablefish N. of 36°	8,050	7,350	6,041	8,329	7,604	6,299	ACL: 40-10 rule applied to 84.9% of coastwide ABC (P* = 0.4)
Sablefish S. of 36°			1,075			1,120	ACL: 40-10 rule applied to 15.1% of coastwide ABC (P* = 0.4)
Shortbelly	6,950	5,789	500	6,950	5,789	500	ABC (P* = 0.4), ACL = 500 mt annually
Shortspine Thornyhead N. of 34°27'	3,144	2,619	1,713	3,116	2,596	1,698	ACL = 65.4% of coastwide ABC (P* = 0.4)
Shortspine Thornyhead S. of 34°27'			906			898	ACL = 34.6% of coastwide ABC (P* = 0.4)

Stock or Stock Complex	2017			2018			Default Harvest Control Rules
	OFL	ABC	ACL	OFL	ABC	ACL	
Spiny dogfish	2,514	2,094	2,094	2,500	2,083	2,083	ACL = ABC (P* = 0.4)
Splitnose S. of 40°10'	1,841	1,760	1,760	1,842	1,761	1,761	ACL = ABC (P* = 0.45)
Starry flounder	1,847	1,282	1,282	1,847	1,282	1,282	ACL = ABC (P* = 0.4). NOTE: The Council is considering managing this stock in the Other Flatfish complex beginning in 2017.
Widow Rockfish	14,130	13,508	2,000	14,511	13,873	2,000	ABC (P* = 0.45), ACL = 2,000 mt annually
Yellowtail N. of 40°10'	6,786	6,196	6,196	6,574	6,002	6,002	ACL = ABC (P* = 0.45)
STOCK COMPLEXES							
Nearshore Rockfish North	118	105	105	119	105	105	Sum of component species specifications
<i>Black and yellow</i>	0.0	0.0	0.0	0.0	0.0	0.0	ACL = ABC (P* = 0.45)
<i>Blue (CA)</i>	34.1	31.1	30.9	34.8	31.8	31.8	ACL = ABC (P* = 0.45) w/40-10 adjustment. The stock is projected to be above target in 2018 under the Expected Catch scenario.
<i>Blue (OR & WA)</i>	32.3	26.9	26.9	32.3	26.9	26.9	ACL = ABC (P* = 0.45)
<i>Brown</i>	2.0	1.8	1.8	2.0	1.9	1.9	ACL = ABC (P* = 0.45)
<i>Calico</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>China</i>	30.2	27.5	27.5	29.3	26.8	26.8	ACL = ABC (P* = 0.45)
<i>Copper</i>	11.2	10.3	10.3	11.6	10.6	10.6	ACL = ABC (P* = 0.45)
<i>Gopher</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Grass</i>	0.7	0.5	0.5	0.7	0.5	0.5	ACL = ABC (P* = 0.45)
<i>Kelp</i>	0.0	0.0	0.0	0.0	0.0	0.0	ACL = ABC (P* = 0.45)
<i>Olive</i>	0.3	0.3	0.3	0.3	0.3	0.3	ACL = ABC (P* = 0.45)
<i>Quillback</i>	7.4	6.2	6.2	7.4	6.2	6.2	ACL = ABC (P* = 0.45)
<i>Treefish</i>	0.2	0.2	0.2	0.2	0.2	0.2	ACL = ABC (P* = 0.45)
Shelf Rockfish North	2,303	2,049	2,049	2,302	2,048	2,047	Sum of component species specifications
<i>Bronzespotted</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Bocaccio</i>	284.0	236.9	236.9	284.0	236.9	236.9	ACL = ABC (P* = 0.45)
<i>Chameleon</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Chilipepper</i>	205.2	196.2	196.2	197.4	188.7	188.7	ACL = ABC (P* = 0.45)
<i>Cowcod</i>	0.4	0.3	0.3	0.4	0.3	0.3	ACL = ABC (P* = 0.45)
<i>Flag</i>	0.1	0.1	0.1	0.1	0.1	0.1	ACL = ABC (P* = 0.45)
<i>Freckled</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Greenblotched</i>	1.3	1.1	1.1	1.3	1.1	1.1	ACL = ABC (P* = 0.45)
<i>Greenspotted 40°10' to 42° N. lat.</i>	9.4	8.5	8.2	9.3	8.5	8.2	ACL: 40-10 rule applied to 22.2% of northern model (CA N of 34°27' N latitude) ABC (P* = 0.45)
<i>Greenspotted N. of 42° N. lat. (OR & WA)</i>	6.1	5.1	5.1	6.1	5.1	5.1	ACL = ABC (P* = 0.45)
<i>Greenstriped</i>	1,299.6	1,186.5	1,186.5	1,306.4	1,192.7	1,192.7	ACL = ABC (P* = 0.45)
<i>Halfbanded</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Harlequin</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Honeycomb</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Mexican</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)

Stock or Stock Complex	2017			2018			Default Harvest Control Rules
	OFL	ABC	ACL	OFL	ABC	ACL	
<i>Pink</i>	0.0	0.0	0.0	0.0	0.0	0.0	ACL = ABC ($P^* = 0.45$)
<i>Pinkrose</i>	-	-	-	-	-	-	ACL = ABC ($P^* = 0.45$)
<i>Puget Sound</i>	-	-	-	-	-	-	ACL = ABC ($P^* = 0.45$)
<i>Pygmy</i>	-	-	-	-	-	-	ACL = ABC ($P^* = 0.45$)
<i>Redstripe</i>	269.9	225.1	225.1	269.9	225.1	225.1	ACL = ABC ($P^* = 0.45$)
<i>Rosethorn</i>	12.9	10.8	10.8	12.9	10.8	10.8	ACL = ABC ($P^* = 0.45$)
<i>Rosy</i>	3.0	2.5	2.5	3.0	2.5	2.5	ACL = ABC ($P^* = 0.45$)
<i>Silvergray</i>	159.4	133.0	133.0	159.4	133.0	133.0	ACL = ABC ($P^* = 0.45$)
<i>Speckled</i>	0.2	0.1	0.1	0.2	0.1	0.1	ACL = ABC ($P^* = 0.45$)
<i>Squarespot</i>	0.2	0.1	0.1	0.2	0.1	0.1	ACL = ABC ($P^* = 0.45$)
<i>Starry</i>	0.0	0.0	0.0	0.0	0.0	0.0	ACL = ABC ($P^* = 0.45$)
<i>Stripetail</i>	40.4	33.7	33.7	40.4	33.7	33.7	ACL = ABC ($P^* = 0.45$)
<i>Swordspine</i>	0.0	0.0	0.0	0.0	0.0	0.0	ACL = ABC ($P^* = 0.45$)
<i>Tiger</i>	1.0	0.8	0.8	1.0	0.8	0.8	ACL = ABC ($P^* = 0.45$)
<i>Vermilion</i>	9.7	8.1	8.1	9.7	8.1	8.1	ACL = ABC ($P^* = 0.45$)
Slope Rockfish North	1,897	1,755	1,755	1,896	1,754	1,754	Sum of component species specifications
<i>Aurora (assuming sigma = 0.39)</i>	17.5	16.6	16.6	17.5	16.6	16.6	ACL = ABC ($P^* = 0.45$)
<i>Bank</i>	17.2	14.4	14.4	17.2	14.4	14.4	ACL = ABC ($P^* = 0.45$)
<i>Blackgill</i>	4.7	3.9	3.9	4.7	3.9	3.9	ACL = ABC ($P^* = 0.45$)
<i>Redbanded</i>	45.3	37.7	37.7	45.3	37.7	37.7	ACL = ABC ($P^* = 0.45$)
<i>Rougheye/Blackspotted</i>	210.7	192.4	192.4	214.6	195.9	195.9	ACL = ABC ($P^* = 0.45$)
<i>Sharpchin</i>	364.0	332.3	332.3	358.4	327.2	327.2	ACL = ABC ($P^* = 0.45$)
<i>Shorthead</i>	18.7	15.6	15.6	18.7	15.6	15.6	ACL = ABC ($P^* = 0.45$)
<i>Splitnose</i>	1,026.7	981.6	981.6	1,027.1	981.9	981.9	ACL = ABC ($P^* = 0.45$)
<i>Yellowmouth</i>	192.4	160.5	160.5	192.4	160.5	160.5	ACL = ABC ($P^* = 0.45$)
Nearshore Rockfish South	1,329	1,166	1,163	1,344	1,180	1,179	Sum of component species specifications
<i>Shallow Nearshore Species</i>	NA						
<i>Black and yellow</i>	27.5	23.0	23.0	27.5	23.0	23.0	ACL = ABC ($P^* = 0.45$)
China	13.3	12.2	10.8	13.8	12.6	11.5	ACL = ABC ($P^* = 0.45$) w/ 40-10 adjustment
<i>Gopher (N of Pt. Conception)</i>	144.0	120.1	120.1	144.0	120.1	120.1	ACL = ABC ($P^* = 0.45$)
<i>Gopher (S of Pt. Conception)</i>	25.6	21.4	21.4	25.6	21.4	21.4	ACL = ABC ($P^* = 0.45$)
<i>Grass</i>	59.6	49.7	49.7	59.6	49.7	49.7	ACL = ABC ($P^* = 0.45$)
<i>Kelp</i>	27.7	23.1	23.1	27.7	23.1	23.1	ACL = ABC ($P^* = 0.45$)
<i>Deeper Nearshore Species</i>	NA						
<i>Blue (assessed area)</i>	234.5	214.1	212.8	239.4	218.6	218.6	ACL = ABC ($P^* = 0.45$) w/40-10 adjustment. The stock is projected to be above target in 2018 under the Expected Catch scenario.
<i>Blue (S of 34°27' N. lat.)</i>	72.9	60.8	60.8	72.9	60.8	60.8	ACL = ABC ($P^* = 0.45$)
<i>Brown</i>	170.0	155.2	155.2	174.0	158.8	158.8	ACL = ABC ($P^* = 0.45$)
<i>Calico</i>	-	-	-	-	-	-	ACL = ABC ($P^* = 0.45$)

Stock or Stock Complex	2017			2018			Default Harvest Control Rules
	OFL	ABC	ACL	OFL	ABC	ACL	
<i>Copper</i>	310.9	283.8	283.8	316.7	289.2	289.2	ACL = ABC (P* = 0.45)
<i>Olive</i>	224.6	187.4	187.4	224.6	187.4	187.4	ACL = ABC (P* = 0.45)
<i>Quillback</i>	5.4	4.5	4.5	5.4	4.5	4.5	ACL = ABC (P* = 0.45)
<i>Treefish</i>	13.2	11.0	11.0	13.2	11.0	11.0	ACL = ABC (P* = 0.45)
Shelf Rockfish South	1,917	1,624	1,623	1,918	1,625	1,624	Sum of component species specifications
<i>Bronzespotted</i>	3.6	3.0	3.0	3.6	3.0	3.0	ACL = ABC (P* = 0.45)
<i>Chameleon</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Flag</i>	23.4	19.5	19.5	23.4	19.5	19.5	ACL = ABC (P* = 0.45)
<i>Freckled</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Greenblotched</i>	23.1	19.3	19.3	23.1	19.3	19.3	ACL = ABC (P* = 0.45)
<i>Greenspotted</i>	78.9	72.0	70.9	78.5	71.7	70.7	ACL: 40-10 rule applied to 77.8% of northern model (CA N of 34°27' N latitude) ABC plus the southern model ABC (P* = 0.45)
<i>Greenstriped</i>	238.4	217.7	217.7	239.6	218.8	218.8	ACL = ABC (P* = 0.45)
<i>Halfbanded</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Harlequin</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Honeycomb</i>	9.9	8.2	8.2	9.9	8.2	8.2	ACL = ABC (P* = 0.45)
<i>Mexican</i>	5.1	4.2	4.2	5.1	4.2	4.2	ACL = ABC (P* = 0.45)
<i>Pink</i>	2.5	2.1	2.1	2.5	2.1	2.1	ACL = ABC (P* = 0.45)
<i>Pinkrose</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Pygmy</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Redstripe</i>	0.5	0.4	0.4	0.5	0.4	0.4	ACL = ABC (P* = 0.45)
<i>Rosethorn</i>	2.1	1.8	1.8	2.1	1.8	1.8	ACL = ABC (P* = 0.45)
<i>Rosy</i>	44.5	37.1	37.1	44.5	37.1	37.1	ACL = ABC (P* = 0.45)
<i>Silvergray</i>	0.5	0.4	0.4	0.5	0.4	0.4	ACL = ABC (P* = 0.45)
<i>Speckled</i>	39.4	32.8	32.8	39.4	32.8	32.8	ACL = ABC (P* = 0.45)
<i>Squarespot</i>	11.1	9.2	9.2	11.1	9.2	9.2	ACL = ABC (P* = 0.45)
<i>Starry</i>	62.6	52.2	52.2	62.6	52.2	52.2	ACL = ABC (P* = 0.45)
<i>Stripetail</i>	23.6	19.7	19.7	23.6	19.7	19.7	ACL = ABC (P* = 0.45)
<i>Swordspine</i>	14.2	11.9	11.9	14.2	11.9	11.9	ACL = ABC (P* = 0.45)
<i>Tiger</i>	0.0	0.0	0.0	0.0	0.0	0.0	ACL = ABC (P* = 0.45)
<i>Vermilion</i>	269.3	224.6	224.6	269.3	224.6	224.6	ACL = ABC (P* = 0.45)
<i>Yellowtail</i>	1,064.4	887.7	887.7	1,064.4	887.7	887.7	ACL = ABC (P* = 0.45)
Slope Rockfish South	827	718	707	683	586	586	Sum of component species specifications
<i>Aurora (assuming sigma = 0.39)</i>	74.4	70.9	70.9	74.5	71.0	71.0	ACL = ABC (P* = 0.45)
<i>Bank</i>	503.2	419.7	419.7	503.2	419.7	419.7	ACL = ABC (P* = 0.45)
<i>Blackgill</i>	143.0	130.6	120.2	NA	NA	NA	ACL = ABC (P*=0.45) w/ 40-10 adjustment. Managed with stock-specific specifications in 2018.
<i>Pacific ocean perch</i>	-	-	-	-	-	-	ACL = ABC (P* = 0.45)
<i>Redbanded</i>	10.4	8.7	8.7	10.4	8.7	8.7	ACL = ABC (P* = 0.45)
<i>Rougheye/Blackspotted</i>	4.3	3.9	3.9	4.4	4.0	4.0	ACL = ABC (P* = 0.45)

Stock or Stock Complex	2017			2018			Default Harvest Control Rules
	OFL	ABC	ACL	OFL	ABC	ACL	
<i>Sharpchin</i>	91.0	83.1	83.1	89.6	81.8	81.8	ACL = ABC (P* = 0.45)
<i>Shorthead</i>	0.1	0.1	0.1	0.1	0.1	0.1	ACL = ABC (P* = 0.45)
<i>Yellowmouth</i>	0.8	0.7	0.7	0.8	0.7	0.7	ACL = ABC (P* = 0.45)
Other Flatfish	11,165	8,510	8,510	9,690	7,281	7,281	Sum of component species specifications
<i>Butter sole</i>	4.6	3.2	3.2	4.6	3.2	3.2	ACL = ABC (P* = 0.4)
<i>Curlfin sole</i>	8.2	5.7	5.7	8.2	5.7	5.7	ACL = ABC (P* = 0.4)
<i>Flathead sole</i>	35.0	24.3	24.3	35.0	24.3	24.3	ACL = ABC (P* = 0.4)
<i>Pacific sanddab</i>	4,801.0	3,331.9	3,331.9	4,801.0	3,331.9	3,331.9	ACL = ABC (P* = 0.4)
<i>Rex sole</i>	5,476	4,562	4,562	4,001	3,333	3,333	ACL = ABC (P* = 0.4)
<i>Rock sole</i>	66.7	46.3	46.3	66.7	46.3	46.3	ACL = ABC (P* = 0.4)
<i>Sand sole</i>	773.2	536.6	536.6	773.2	536.6	536.6	ACL = ABC (P* = 0.4)
Other Fish	537	474	474	501	441	441	Sum of component species specifications
<i>Cabezon (WA)</i>	4.5	3.8	3.8	4.8	4.0	4.0	ACL = ABC (P* = 0.45)
<i>Kelp greenling (CA)</i>	118.9	99.2	99.2	118.9	99.2	99.2	ACL = ABC (P* = 0.45)
<i>Kelp greenling (OR)</i>	239.1	226.2	226.2	203.2	192.2	192.2	Preferred ACL = ABC (P* = 0.45)
<i>Kelp greenling (WA)</i>	7.1	5.9	5.9	7.1	5.9	5.9	Preferred ACL = ABC (P* = 0.45)
<i>Leopard shark</i>	167.1	139.4	139.4	167.1	139.4	139.4	ACL = ABC (P* = 0.45)

2.1.2 Alternative 1

Alternative 1 incorporates the default harvest specifications (see No Action) for all stocks and stock complexes except for the stocks and stock complexes shown in Table 2-2. The changes from No Action are:

- Darkblotched harvest specifications would be based on an ACL HCR equal to the ABC under a P* of 0.45. This departure from the rebuilding plan is based on the projection in the 2015 assessment (Gertseva, *et al.* 2015) that the stock would attain its rebuilding target by the start of 2016.
- Big skate would be actively managed by removing the EC designation and applying a stock-specific ACL HCR equal to the ABC under a P* of 0.45.
- The HCR for California black rockfish would be a constant catch ACL predicted to maintain the stock above the 40 percent depletion target in the next ten years.
- The HCR for California scorpionfish is a 150 mt constant catch ACL.
- The canary rockfish HCR is a 50 percent reduction from the default (No Action) ACL.
- The HCR for widow rockfish is ACL = ABC under a P* of 0.45. These harvest specifications are determined from the 2015 widow rockfish assessment (Hicks and Wetzel 2015).

Table 2-2. Alternative 1 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for select west coast groundfish stocks (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in status quo stock complexes in italics).

Stock	2017			2018			ACL Basis
	OFL	ABC	ACL	OFL	ABC	ACL	
DARKBLOTCHED ROCKFISH	671	641	641	683	653	653	ACL = ABC (P* = 0.45)
Big Skate	541	494	494	541	494	494	ACL= ABC (P* = 0.45)
Black Rockfish (CA)	349	334	319	348	333	319	Constant catch ACL which maintains stock depletion above 40% in the next 10 years
California scorpionfish	289	264	150	278	254	150	150 mt constant catch
Canary Rockfish	1,793	1,714	857	1,735	1,659	763	50% of No Action ACL
Widow Rockfish	14,130	13,508	13,508	13,237	12,655	12,655	ACL = ABC (P* = 0.45)

2.1.3 Alternative 2

Alternative 2 harvest specifications are the same as Alternative 1 (including No Action default specifications for all stocks except those listed under Alternative 1) except that the canary rockfish ACL is 33 percent of the No Action ACL.

Table 2-3. Alternative 2 2017 and 2018 harvest specifications (overfishing limits (OFLs in mt), acceptable biological catches (ABCs in mt), and annual catch limits (ACLs in mt)), for select west coast groundfish stocks (overfished stocks in CAPS; stocks with new assessments in bold; component stocks in status quo stock complexes in italics).

Stock	2017			2018			ACL Basis
	OFL	ABC	ACL	OFL	ABC	ACL	
Canary Rockfish	1,793	1,714	566	1,760	1,526	504	33% of No Action ACL

2.1.4 Preferred Alternative

The No Action harvest specifications for all stocks and stock complexes in Table 2-1 are preferred except those shown for darkblotched rockfish, black rockfish in California, California scorpionfish, canary rockfish, and widow rockfish. The preferred alternative for these stocks will be decided in April 2016.

The preferred alternative for managing big skate is to remove the EC designation and to actively manage the species with stock-specific harvest specifications.

2.2 Stock-Specific Impacts of Alternative Harvest Specifications

Harvest specifications establish objectives for stock management and as a consequence do not have direct impacts on the environment. Most environmental impacts result from the implementation of management measures intended to allow harvests to equal but not exceed ACLs. For that reason, most environmental impacts are evaluated in Sections 3 through 5, which encompass the management program to be implemented for the 2017-2018 biennial period. Impacts of harvest specifications are evaluated with respect to whether management reference points will be exceeded over the long term. The management reference points are the maximum fishing mortality threshold, equal to the OFL, and the minimum stock size threshold, which is $B_{12.5\%}$ for flatfish and $B_{25\%}$ for stocks other than flatfish.⁴

2.2.1 Darkblotched Rockfish Impacts

The 2015 darkblotched rockfish assessment (Gertseva, *et al.* 2015) estimated a spawning stock depletion of 39.3 percent at the start of 2015 or just under the target biomass depletion ratio of 40 percent of unfished biomass. The 2015 assessment projects the stock will be rebuilt by the start of 2016 before new harvest specifications are implemented in 2017. This is the rationale for the higher ACL alternative for darkblotched. The HCR of setting the ACL equal to the ABC under a P^* of 0.45 is the highest ACL that can be considered given the harvest specification framework outlined in the FMP.

The predicted status of darkblotched rockfish in the next ten years associated with the alternative harvest control rules analyzed for 2017 and beyond indicate the stock will remain healthy with depletion above 40% (Figure 2-1). Depletion in 2026 under the No Action ACL alternative is predicted to be 64% and that under the Alternative 1 ACL alternative is 50%.

The optimistic projection the stock would rebuild by the start of 2016 may compel consideration of changing the target rebuilding year of 2025 in the current darkblotched rebuilding plan. While it is highly probable the stock will rebuild much sooner than 2025 given its current status, the darkblotched assessment has always been highly uncertain and sensitive to trends in the NMFS trawl survey. The NMFS trawl survey tends to provide highly variable catch per unit of effort (CPUE) trends for darkblotched and other slope rockfish and is not a particularly reliable survey of relative interannual biomass of these species. Further, estimated darkblotched biomass and stock depletion are sensitive to changes in assumed steepness and natural mortality in the assessment. However, given the stock is so close to the rebuilding target and the SSC's recommendation to conduct an update darkblotched assessment next year, it is likely the next stock assessment will not indicate successful stock rebuilding. Changes in the structure of the stock assessment model, which are not allowed in an update, will not influence a different model result in this case. In general, the SSC has recommended against continuing to chase noise in an assessment or rebuilding analysis by always setting the target year to the predicted median time to rebuild (i.e., the year predicted

⁴ Biomass reference points and projections are scaled to unfished spawning biomass and referred to as the *depletion ratio*, which is the biomass estimate divided by the unfished biomass estimate for a particular stock. (In this document references to stock biomass generally refer to spawning stock biomass.)

for the stock to reach the rebuilding target with a 50 percent probability), especially as the predicted target rebuilding year is approached. The extreme outcome of such a strategy when considering rebuilding plan amendments is that there would be a 50 percent probability of succeeding or failing to attain the rebuilding target in the year specified as the target year. In this case, the probability of darkblotched not confirmed to be rebuilt in an update assessment next year is low.

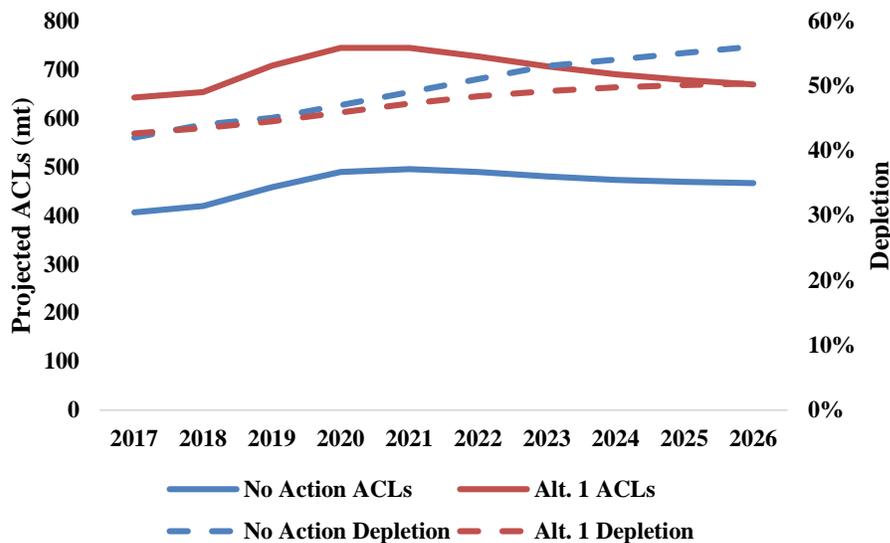


Figure 2-1. Ten-year projections of annual catch limits and predicted depletions for darkblotched rockfish under alternative harvest control rules.

2.2.2 Big Skate Impacts

The preferred alternative for managing big skate is to remove the EC designation and to actively manage the species with stock-specific harvest specifications. The rationale for this action is based on new evidence that big skate are targeted in trawl fisheries and retained for sale in greater amounts than previously understood. When the Council considered designating all skates except longnose skate as EC species, the GMT estimated that catches of big skate averaged 95 mt from 2007–2011 with large landings of Unspecified Skate (see Table 4-33 in the 2015-2016 Harvest Specifications and Management Measures Final Environmental Impact Statement). Subsequent analysis of Oregon port sampling data not available when the Council considered the EC designation indicated about 98 percent of the recent Unspecified Skate landings in Oregon were comprised of big skate. The GMT revised the total mortality estimates of big skate coastwide using these new data (Table 2-4). Such large landings indicates targeting of big skate has occurred and an EC designation was not warranted.

The SSC-endorsed OFL of 541 mt is calculated by applying approximate MSY harvest rates to estimates of stock biomass from the Northwest Fisheries Science Center (NWFSC) West Coast Bottom Trawl Survey (see [Agenda Item H.6.a, Supplemental Attachment 6, November 2013](#)). The survey-based biomass estimate is likely underestimated since big skate are distributed to the shore and no west coast trawl surveys have been conducted shallower than 55 m. This adds a level of precaution to the management of big skate with stock-specific management reducing management uncertainty and the risk of overfishing the stock. There was consideration for managing big skate in a complex with longnose skate, the other actively managed west coast skate species, but the two species have disparate distributions and fishery interactions (longnose is much more deeply distributed than big skate) and that option was not endorsed. The Council chose to set the ACL equal to the ABC with a P* of 0.45.

Table 2-4. 2010-2015 total mortality (mt) of big skate by sector in west coast fisheries.

Sector	2010	2011	2012	2013	2014	2015
Incidental OA						
Landings	3.0	5.2	1.1	3.8	2.0	3.8
Discards	0.0	0.6	0.1	0.0	0.0	0.0
Total	3.0	5.7	1.1	3.8	2.1	3.8
Non-Trawl						
Landings	16.2	9.7	3.3	6.4	8.9	3.3
Discards	1.6	2.7	6.7	5.1	3.3	3.3
Total	17.8	12.4	10.1	11.5	12.2	6.6
Trawl						
Landings	173.2	236.1	227.7	123.6	354.3	276.7
Discards	28.8	35.9	30.6	36.5	43.8	43.8
Total	202.0	272.0	258.3	160.1	398.1	320.4
Tribal						
Landings	3.8	5.5	12.4	10.3	9.7	16.9
Discards	0.1	0.1	0.0	0.0	0.0	0.0
Total	3.8	5.5	12.4	10.3	9.7	16.9
Total All Sectors	226.6	295.7	281.8	185.8	422.1	347.8

2.2.3 California Black Rockfish Impacts

The No Action ACL for black rockfish off California is based on the ACL being set equal to the ABC with a P* of 0.45. Application of this harvest control rule for the next ten years is predicted to maintain the stock above its B_{40%} target (Table 2-5).

The Alternative 1 ACL for black rockfish off California is calculated as a constant catch limit that is predicted to maintain the stock above its B_{40%} target and projected ABCs (using a P* of 0.45) for the next ten years. The 319 mt ACL is projected using the 2015 assessment base model (Cope, *et al.* 2015) and achieves both conditions. While the Alternative 1 ACL is smaller than the No Action ACL in 2017 and 2018, it does provide a measure of management stability. The Alternative 1 harvest control rule, if maintained in the next ten years, provides a slightly higher ACL than the No Action harvest control rule after 2023 (Table 2-5 and Table 2-6). Both alternatives are predicted to have the same impact after ten years with a predicted depletion of 50% (Figure 2-2).

Table 2-5. Harvest projection in mt of OFLs and ACLs, summary biomass (age-3 and older), spawning output, and depletion for the California black rockfish base case model under No Action harvest control rules projected with total projected catch equal to a harvest rate of SPR = 64.9% in 2017 and beyond.

Year	OFL	ACL	Age 3+ biomass	Spawning output	Depletion (%)
2015	354	420	5,773	353	33%
2016	354	420	5,800	396	37%
2017	349	334	5,754	450	42%
2018	347	332	5,747	503	47%
2019	344	329	5,716	538	51%
2020	341	326	5,677	555	52%
2021	338	323	5,640	558	53%
2022	336	321	5,608	554	52%
2023	334	319	5,583	547	52%
2024	333	318	5,565	539	51%
2025	332	318	5,550	532	50%
2026	332	317	5,540	526	50%

Table 2-6. Harvest projection in mt of OFLs and ACLs, summary biomass (age-3 and older), spawning output, and depletion for the California black rockfish base case model under Alternative 1 harvest control rules projected with total projected catch equal to the 319 mt in 2017 and beyond.

Year	OFL	ACL	Age 3+ biomass	Spawning output	Depletion (%)
2015	354	420	5,773	353	33%
2016	354	420	5,800	396	37%
2017	349	319	5,754	450	42%
2018	348	319	5,762	505	48%
2019	346	319	5,744	541	51%
2020	343	319	5,714	559	53%
2021	340	319	5,682	564	53%
2022	338	319	5,652	561	53%
2023	337	319	5,628	554	52%
2024	336	319	5,608	546	51%
2025	335	319	5,591	539	51%
2026	334	319	5,578	533	50%

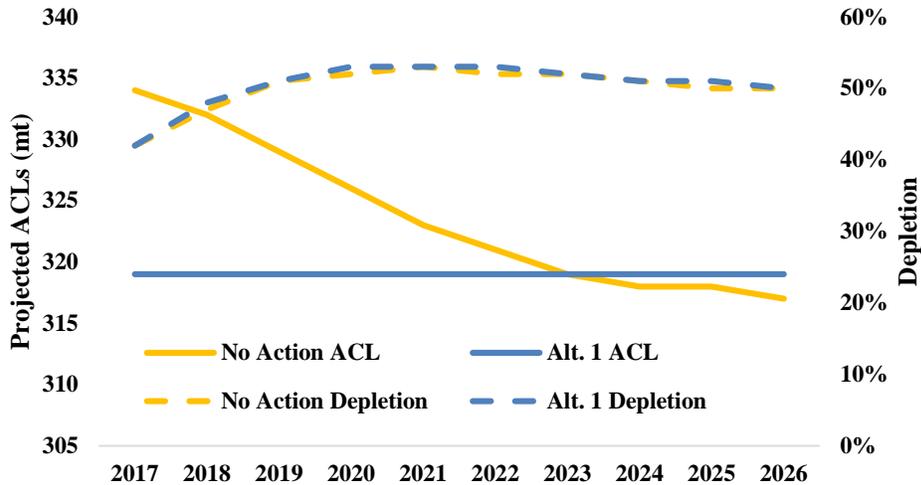


Figure 2-2. Ten-year projections of annual catch limits and predicted depletions for black rockfish off California under alternative harvest control rules.

2.2.4 California Scorpionfish Impacts

Harvest specifications for California scorpionfish are determined using catch-only projections based on the 2005 assessment model (Maunder, *et al.* 2006) and estimates of recent catches by California Department of Fish and Wildlife (Table 2-6). The SSC designated California scorpionfish a category 2 stock, since the assessment was conducted over ten years ago. The SSC noted that the increase in the OFL relative to the 2015-2016 values (289 and 256 mt for 2017-2018 OFLs, relative to 114 and 111 mt for 2015-2016 OFLs) is a consequence of using realized catches in the 2005-2014 period, rather than the projected catches in the 2005 model. Specifically, the 2005 model projected a 2015 depletion level of 48 percent if total catches were realized, but as actual catches in that period were lower than the 2005 projections, the revised projection led to an estimated 2014 depletion of 72 percent. This more optimistic (albeit, considerably uncertain given the age of the assessment) perception of stock status is the primary contributing factor to the increase in estimated OFL relative to the ten-year projections from the 2005 model. The expected total mortality of 111 mt from 2017-2026 in Table 2-6 is based on an annual catch target (ACT) recommended by the Council.

The Alternative 1 ACL of 150 mt was recommended by the GAP as a more precautionary interim measure until a new assessment is conducted. The GAP recommended this ACL should provide sufficient amounts to support satisfactory seasons for the recreational and commercial sectors.

Table 2-7. Estimated total mortality and depletion of California scorpionfish with projected 2017-2026 harvest specifications based on the default harvest control rule and expected total mortality after 2014.

Year	Depletion	OFL	ABC/ACL	Total Mortality
2007	86.5%			138
2008	84.0%			102
2009	82.6%			112
2010	80.7%			105
2011	79.1%			104
2012	77.6%			120
2013	75.6%			115
2014	74.0%			124
2015	72.2%	119	114	114
2016	71.1%	117	111	111
2017	70.3%	289	264	111
2018	69.6%	286	261	111
2019	69.0%	283	259	111
2020	68.5%	281	256	111
2021	68.0%	279	255	111
2022	67.6%	277	253	111
2023	67.2%	276	252	111
2024	66.9%	274	250	111
2025	66.6%	273	249	111
2026	66.4%	272	248	111

2.2.5 Canary Rockfish Impacts

The 2015 canary rockfish assessment estimated depletion of canary rockfish to be 55.5 percent at the start of 2015 (Thorson and Wetzel 2015), which represents a substantial improvement in status from previous canary rockfish assessments. The primary factors driving the improvement in stock status are the use of a higher steepness value, the reduction in harvest due to the rebuilding plan, and above-average recruitments in 2001-2003, 2007, and 2010. The relatively strong effect of steepness on estimated stock status is a reason for concern about the reliability of model results, since steepness is a relatively uncertain parameter value. However it should be noted that even a relatively low steepness of 0.6 (e.g., the low state of nature in the steepness decision table) results in a biomass estimate above the rebuilding target (Table 2-7).

The uncertainty in steepness and the unexpectedly improved status compelled the Council to explore more precautionary harvest control rule alternatives. The GMT also pointed out that stock depletion was predicted to drop below the B_{40%} biomass target by 2019 under the less likely low state of nature (Table 2-7). The Alternative 1 and 2 canary harvest control rules are 50 percent and 33 percent of the No Action ACL, respectively. All three alternatives estimate depletion will remain above the B_{40%} target in the next ten years under the 2015 assessment base model (Table 2-8 and Figure 2-3). However, under the less likely and more pessimistic low state of nature model, the stock is predicted to remain healthy only under the Alternative 1 and 2 harvest control rules; the stock is predicted to fall below the biomass target within ten years to 32% by 2026 under the No Action alternative ((Table 2-8 and Figure 2-4).

Table 2-8. Projected spawning biomass and depletion of canary rockfish under the low state of nature and base models in the 2015 assessment assuming removals under default harvest control rules.

			State of nature			
			Low h = 0.60		Base case h=0.773	
Relative probability of ln(SB_2015)			0.25		0.5	
Default Harvest Control Rule	Year	ACL (mt)	Spawning biomass (mt)	Depletion	Spawning biomass (mt)	Depletion
ACL = ABC (P* = 0.45)	2017	1,714	3,259	42.8%	4,261	56.9%
	2018	1,526	3,135	41.2%	4,147	55.4%
	2019	1,415	3,017	39.6%	4,037	53.9%
	2020	1,346	2,895	38.0%	3,916	52.3%
	2021	1,297	2,771	36.4%	3,787	50.6%
	2022	1,260	2,656	34.9%	3,662	48.9%
	2023	1,231	2,565	33.7%	3,557	47.5%
	2024	1,210	2,501	32.8%	3,480	46.5%
	2025	1,194	2,462	32.3%	3,429	45.8%
	2026	1,180	2,445	32.1%	3,402	45.4%

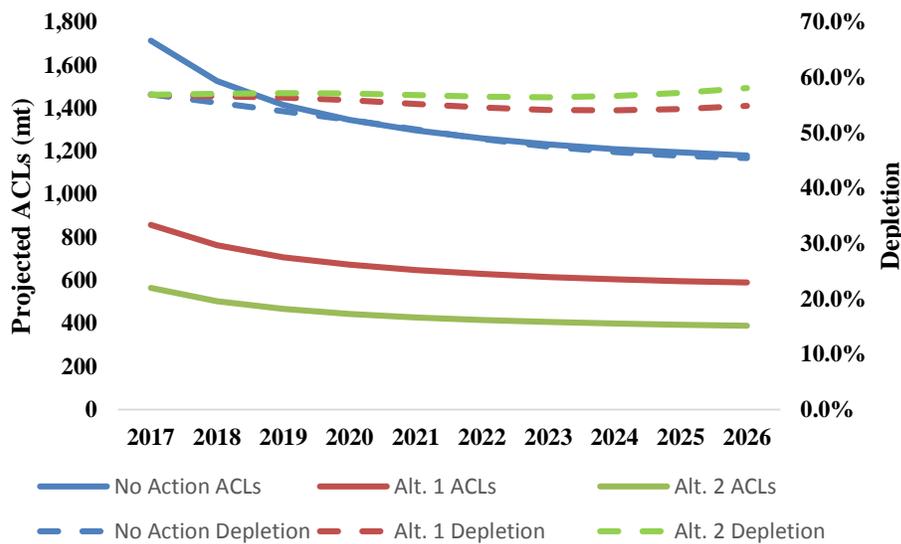


Figure 2-3. Ten-year projections of annual catch limits and depletions for canary rockfish under alternative harvest control rules assuming the base model in the 2015 assessment.

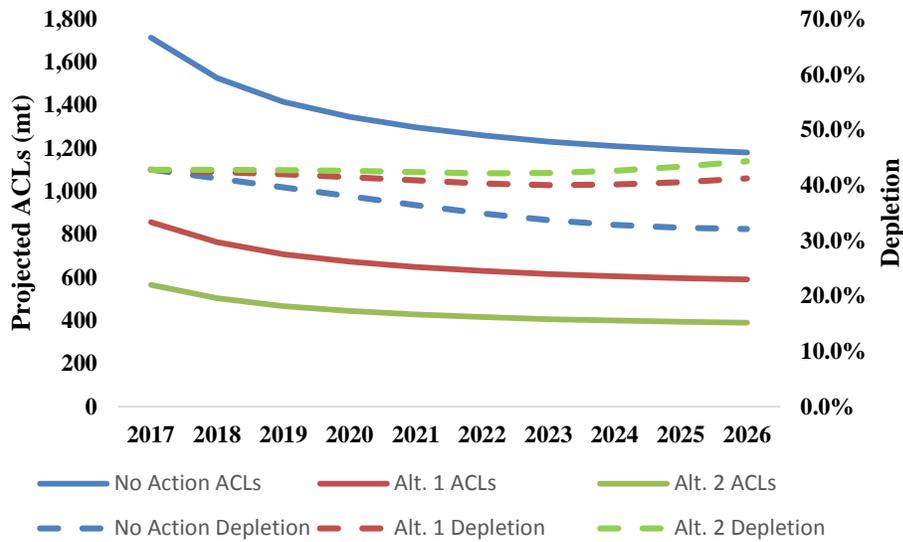


Figure 2-4. Ten-year projections of annual catch limits and depletions for canary rockfish under alternative harvest control rules assuming the low state of nature model in the 2015 assessment.

Table 2-9. Projected harvest specifications, spawning biomass and depletion under the alternatives analyzed for canary rockfish using the base case model in the 2015 assessment.

Year	No Action (Default HCR)				Alt. 1 (50% of No Action ACL)				Alt. 2 (33% of No Action ACL)			
	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion
2017	1,793	1,714	4,261	56.9%	1,793	857	4,261	56.9%	1,793	566	4,261	56.9%
2018	1,661	1,526	4,147	55.4%	1,735	763	4,240	56.6%	1,760	504	4,272	57.0%
2019	1,579	1,415	4,037	53.9%	1,714	707	4,219	56.3%	1,761	467	4,281	57.1%
2020	1,532	1,346	3,916	52.3%	1,725	673	4,184	55.9%	1,791	444	4,275	57.1%
2021	1,502	1,297	3,787	50.6%	1,751	649	4,136	55.2%	1,836	428	4,255	56.8%
2022	1,480	1,260	3,662	48.9%	1,783	630	4,087	54.6%	1,884	416	4,232	56.5%
2023	1,461	1,231	3,557	47.5%	1,815	616	4,055	54.1%	1,932	406	4,225	56.4%
2024	1,445	1,210	3,480	46.5%	1,847	605	4,048	54.0%	1,979	399	4,242	56.6%
2025	1,429	1,194	3,429	45.8%	1,878	597	4,067	54.3%	2,024	394	4,285	57.2%
2026	1,413	1,180	3,402	45.4%	1,909	590	4,108	54.8%	2,068	389	4,349	58.1%

2.2.6 Widow Rockfish Impacts

The 2015 widow rockfish assessment estimated depletion to be at 75.1 percent at the start of 2015 and has increased steadily since a low of 37.3 percent depletion in 1998 (Hicks and Wetzel 2015). Increases in stock size are due to the low level of harvest and strong recruitments in 2008 and 2010. A number of revisions were made to the data used for the current stock assessment, including 1) a new method of index standardization for NWFSC trawl survey using a geo-statistical delta-GLMM model, 2) a new steepness value (0.798) based on an updated meta-analysis of steepness, 3) a prior distribution developed for the natural mortality parameter from an analysis of a maximum age of 54 years, 4) updated methods of expanding fishery length and age composition, and survey conditional age at length, and 5) new ageing error tables. For this assessment, there was a more thorough investigation of available age and length data, increasing the amount of these data relative to previous assessments. In addition, Washington historical landings were reconstructed. The SSC recommended this as a category 1 assessment and the proxy category 1 sigma of 0.36 be used to determine the ABC buffer. The previous 2011 assessment (He, *et al.* 2011) results were considered relatively less certain, and the previously assigned sigma value was 0.41.

The No Action ACL of 2,000 mt per year was previously adopted due to the uncertainty in the 2011 assessment. The 2015 assessment results indicate a much more certain and optimistic perception of current stock depletion (Figure 2-1). The risk to the stock of changing the harvest control rule to the highest ACL allowed in the FMP harvest specification framework (ACL = ABC under a P* of 0.45) is estimated to be low with a predicted depletion in 2026 of 56% (Table 2-9 and Figure 2-6). The stock is projected to remain healthy (i.e., at or above the B_{40%} biomass target) for the next ten years even under the more pessimistic and less likely low state of nature model provided in the 2015 assessment (Table 2-9).

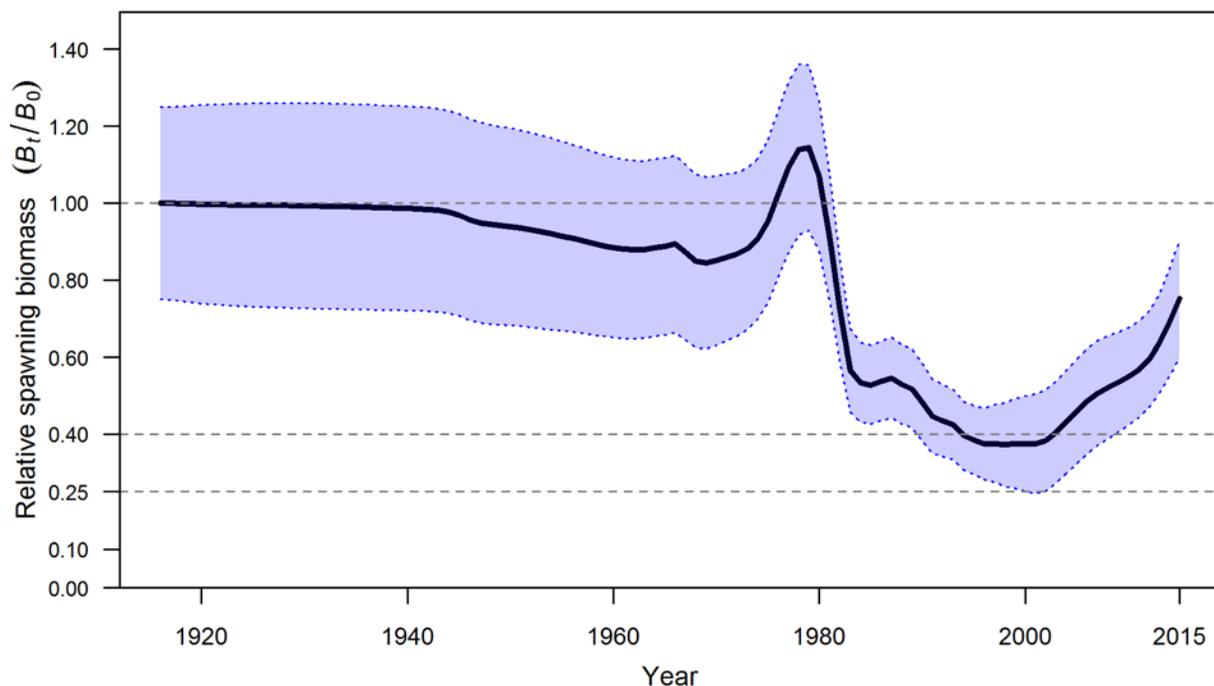


Figure 2-5. Estimated relative spawning biomass (depletion) with approximate 95 percent asymptotic confidence intervals (filled area) for the base case widow rockfish assessment model.

Table 2-10. Projected spawning biomass and depletion of widow rockfish under the low state of nature and base models in the 2015 assessment assuming removals under alternative harvest control rules.

				State of nature			
				Low		Base case	
Relative probability of ln(SB_2013)				0.25		0.5	
Harvest Control Rule	Year	OFL (mt)	ACL (mt)	Spawning biomass (mt)	Depletion	Spawning biomass (mt)	Depletion
No Action (ACL = 2,000 mt)	2015	12,259	2,000	48,360	59%	60,608	75%
	2016	13,368	2,000	51,094	62%	64,599	80%
	2017	14,130	2,000	53,178	64%	67,674	84%
	2018	14,511	2,000	54,831	67%	69,856	87%
	2019	14,746	2,000	56,417	68%	71,533	89%
	2020	14,966	2,000	58,025	70%	72,892	90%
	2021	15,132	2,000	59,510	72%	73,866	92%
	2022	15,200	2,000	60,750	74%	74,413	92%
	2023	15,179	2,000	61,745	75%	74,604	92%
	2024	15,108	2,000	62,549	76%	74,556	92%
	2025	15,017	2,000	63,222	77%	74,369	92%
	2026	14,924	2,000	63,805	77%	74,110	92%
Alt. 1 (ACL = ABC (P* =0.45))	2015	12,259	2000	48,360	59%	60,608	75%
	2016	13,368	2000	51,094	62%	64,599	80%
	2017	14,130	13,508	53,178	64%	67,675	84%
	2018	13,237	12,655	48,794	59%	63,900	79%
	2019	12,375	11,830	45,047	55%	60,314	75%
	2020	11,714	11,198	42,188	51%	57,284	71%
	2021	11,181	10,689	39,951	48%	54,659	68%
	2022	10,691	10,221	38,060	46%	52,260	65%
	2023	10,235	9,784	36,431	44%	50,080	62%
	2024	9,835	9,402	35,056	43%	48,173	60%
	2025	9,502	9,083	33,908	41%	46,561	58%
	2026	9,232	8,826	32,943	40%	45,225	56%

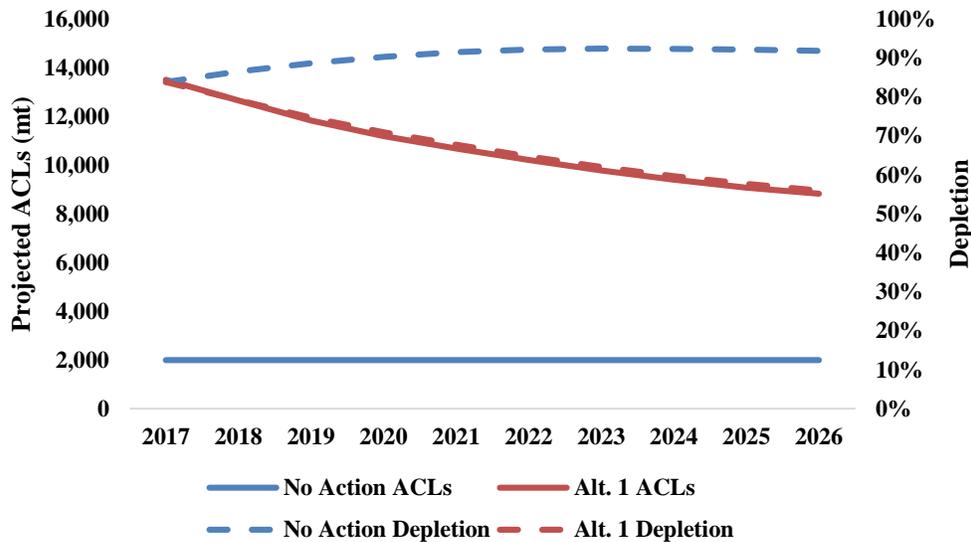


Figure 2-6. Ten-year projections of annual catch limits and depletions for widow rockfish under alternative harvest control rules assuming the base model in the 2015 assessment.

2.2.7 Summary of the Impacts of the Harvest Specifications Alternatives to Groundfish Stocks

Both the MSA and the optimum yield framework described in Chapter 4 of the PCGFMP establish a framework intended to achieve the purpose of the proposed action, which is to prevent overfishing, to rebuild overfished stocks, to ensure conservation, to facilitate long-term protection of EFH, and to realize the full potential of the Nation’s fishery resources (MSA §2(a)(6)). Since the alternatives described in Section 2 are consistent with this framework, the available scientific information shows that the proposed harvest specifications will not result in overfishing (catch exceeding the OFL) or result in the stock becoming overfished within the foreseeable future. Section 4.4 in the PCGFMP describes how scientific uncertainty and management risk tolerance are used to compute a precautionary reduction from the OFL to determine the ABC. The default policy for healthy stocks (biomass above the biomass target / B_{MSY} proxy) is to set the ACL equal to the ABC. For some stocks, a further reduction below the ABC may be applied to mitigate risk or rebuild stock biomass to the target. Fisheries are then managed to attain but not exceed the ACL. These reductions substantially reduce the risk that overfishing will occur. Furthermore, because the biennial process is an adaptive management process, as new information becomes available adjustments can be made to catch limits and harvest policies to minimize the likelihood of a stock becoming overfished and to end overfishing if it has occurred.

The Environmental Impact Statement (EIS) evaluating the 2015-2016 harvest specifications and Amendment 24 also evaluated the long-term impacts of different harvest policies and related HCRs. The preferred alternative in that EIS – use the HCRs in place during the previous biennial period as the default HCRs – is the method used to determine harvest specifications under the No Action alternative. The impact evaluation in that EIS projected stock status over a 10-year period for different states of nature, assuming the full ABC value is harvested in each year. States of nature represent alternative values of a key stock assessment parameter in order to capture uncertainty about its true value. In the impact assessment, these alternative states of nature were used to explore the risk of overfishing and overfished status occurring. This analysis showed that the harvest policies in the PCGFMP have a low risk of resulting in overfishing and overfished status for any managed groundfish stock. As noted, the analysis assumed that the ABC is harvested, while for most stocks the actual harvest is below the ABC. This means that in practice the risk is even lower.

As discussed above, the status of canary rockfish has changed and it will no longer be managed under a rebuilding plan. Under the default policy (ACL=ABC, P*=0.45) there is a risk that the stock could decline below the target reference point (the B_{MSY} proxy of $B_{40\%}$) over the next ten years if 1) the ACL is fully harvested in each year, and 2) the steepness parameter is actually lower than the expected value (see Table 2-7). However, if new information indicated that the stock had declined below $B_{40\%}$ the precautionary reduction (in this case the 40-10 rule) would be applied to determine ACLs in future management cycles. This reduction is intended to return stock size to the target biomass level.

Based on the impact evaluation in the Amendment 24 EIS and relevant new information, the risk that overfishing will occur, or that a stock will become overfished over the long term, is very low when default HCRs are applied under the No Action Alternative.

The proposed harvest specifications under Alternative 1 are the same as No Action with the exception of six stocks as shown in Table 2-10. The HCRs under Alternative 1 are consistent with the optimum yield framework in the PCGFMP and present a low risk of overfishing or decline to overfished status for these six stocks. The ACLs for darkblotched rockfish and widow rockfish would be higher than those under No Action based on the application of alternative HCRs while the ACLs for three stocks would be lower than under No Action. The ACLs for these stocks are even more precautionary than Alternative 1 in terms of the impact of fishing on stock status. As discussed previously, big skate is proposed for reclassification as a managed stock with associated harvest specifications under Alternative 1. The application of stock-specific harvest specifications lowers the risk of fishing impairing stock status compared to the previous EC designation.

Table 2-11. Comparison of alternative harvest specifications. (No Action default specifications proposed for all other stocks under all three alternatives.)

Stock	No Action		Alternative 1		Alternative 2	
	2017-18 ACLs	ACL Basis	2017-18 ACLs	ACL Basis	2017-18 ACLs	ACL Basis
Darkblotched Rockfish	406/419	SPR = 64.9%	641/653	ACL = ABC	Same as Alternative 1	
Big Skate	N/A	N/A	494/494	ACL = ABC	Same as Alternative 1	
Black Rockfish (CA)	334/332	ACL = ABC	319/319	Constant catch ACL	Same as Alternative 1	
California scorpionfish	264/261	ACL = ABC	150/150	Constant catch ACL	Same as Alternative 1	
Canary Rockfish	1,714/1,588	ACL = ABC	763/857	50% of No Action ACL	566/504	33% of No Action ACL
Widow Rockfish	2,000/2,000	Constant catch ACL	13,508/12,655	ACL = ABC	Same as Alternative 1	

Note: For alternatives where the ACL basis is ACL = ABC a P* value of 0.45 is applied.

As discussed in Section 2.2.1, the alternative HCR for darkblotched rockfish is based on the projection that darkblotched rockfish will achieve rebuilt status before the next biennial period begins. The default HCR for healthy stocks (at or above the target reference point) would be implemented under this alternative. This represents a moderately higher risk that the stock could again fall below the target. **As noted above, if a future assessment showed that the stock had fallen below the target, the precautionary HCR, in this case the “40-10 rule” (see Section 4.6.1 in the PCGFMP).** Would be implemented?

As in Section 2.2.6, widow rockfish was declared rebuilt in 2010, but the Council adopted a constant catch HCR that was more precautionary than the default HCR for healthy stocks. The most recent stock assessment

shows that stock biomass is well above the target and projections show that even under the more pessimistic state of nature, stock biomass would decline to the target over 10 years. Widow rockfish was historically a target species, and a higher ACL would allow the development of fisheries for this and co-occurring stocks such as yellowtail rockfish.

Alternative 1 is consistent with the optimum yield framework described in the PCGFMP and present a low risk that any managed stock will be subject to overfishing or become overfished in the foreseeable future.

Alternative 2 is the same as Alternative 1 for all managed groundfish stocks except for canary rockfish. For this stock, which has just been declared rebuilt, a still more precautionary HCR is proposed. As shown in Table 2-7, there is a risk, assuming that the steepness parameter is overestimated, that stock biomass could decline below the biomass target and approach the minimum stock size threshold of $B_{20\%}$. This is the reason for considering the precautionary reduction under both Alternative 1 (50 percent reduction from the default ACL) and Alternative 2 (67 percent reduction from the default ACL).

Alternative 2 is consistent with the optimum yield framework described in the PCGFMP and presents a low risk that any managed stock will be subject to overfishing or become overfished in the foreseeable future and the lowest risk for the recently rebuilt canary rockfish stock.

3. New Management Measures

New management measures may be adopted during the biennial specifications process and include those measures where the impacts have not yet been previously analyzed and/or have not been previously implemented in regulation. The Council is considering several new management measures for implementation in 2017-2018 (Table 3-1). Additionally, some changes to management measures require additional analysis compared to the routine measures, and are highlighted in Table 3-1. Detailed analysis of new management measures and enhanced analysis for selected existing measures is provided in Appendix B, and summary impacts are described in Chapter 4 Integrated Alternatives.

Table 3-1. New Management Measures under Consideration for Implementation in 2017-2018.

Management Measure	Description	Category	FMP Change
RCA Coordinates	Update selected RCA coordinates in California to better approximate depth contours	Correction to Regulations, updated analysis requested	No
Limited Entry and Open Access Fixed Gear Canary Rockfish Retention		Existing routine measure, additional analysis requested	No
Canary Rockfish Retention in California		Existing routine measure, additional analysis requested	No
Big Skate FMP Classification	Change classification from EC to “in the fishery”	New	Yes
Manage Starry Flounder in the Other Flatfish Complex	Manage starry flounder in the Other Flatfish Complex	New	Yes, Amendment 21 allocations and Appendix E
Transfer of Shorebased QP to the Mothership Sector	Allow a limited transfer of QP for selected species from the shorebased IFQ to mothership (MS) co-ops	New	Appendix E
Oregon Flatfish Fishery	Allow the targeting of flatfish species, other than Pacific halibut, seaward of the seasonal depth restriction	New	No
New Inseason Process for California	Grant NMFS authority to change routine management measures in the recreational and commercial fisheries based upon attainment or projected attainment of a Federal harvest limit for black rockfish, canary rockfish, and yelloweye rockfish	New	Yes
Overfished Species Hotspot Closures	Establish areas closed to fishing to reduce overfished species bycatch	New	No
Petrale Sole Seasons	Exempt petrale sole from the season and depth restrictions in the California recreational groundfish fishery	New	No

4. Integrated Alternatives

Integrated alternatives incorporate harvest specifications and routine management measures into discrete management programs in order to facilitate evaluation of environmental impacts. Routine management measures include the allocation of harvest opportunity between commercial and recreational groundfish fisheries, among commercial fishery sectors, and, for the purpose of managing recreational fisheries, among the three West Coast states. Many of these allocations are specified in the PCGFMP, others are specified as part of the biennial management process. Before these allocations are made, amounts may be deducted from ACLs to account for tribal fishery catch, research catch, and catch under exempted fishing permits (EFPs). Routine management measures are intended to regulate catch so that ACLs may be met but not exceeded. New management measures described in Chapter 3 and analyzed in Appendix B could be added to any alternative.

4.1.1 No Action

4.1.1.1 Deductions from the ACL

Deductions from most groundfish ACLs, called off-the-top deductions, are made to account for groundfish mortality in the Pacific Coast treaty Indian tribal fisheries, scientific research, non-groundfish target fisheries (hereinafter incidental open access fisheries), and, as necessary, EFPs. Off-the-top deductions from the sablefish north of 36° N. latitude ACL are slightly different due to the sablefish allocation framework and include groundfish mortality in tribal fisheries, research, recreational fisheries, and EFPs. Sufficient yield set-asides must be available to accommodate the anticipated groundfish mortality from the aforementioned activities to increase the probability that catches will remain at or below the ACLs.

Amounts deducted from the ACL to accommodate groundfish mortality from scientific research, incidental open access fisheries, and EFPs can be modified inseason based on the best available information. The amount estimated to go unharvested could be reapportioned back to the groundfish fishery according to sector needs. The reapportionment can be done through an inseason action published in the *Federal Register* following a Council meeting. At a Council meeting, the Council would review the off-the-top deductions from the ACL and recommend full reapportionment, partial reapportionment, or no reapportionment, based on the allocation framework criteria and objectives outlined in the FMP and managing the risk of exceeding an ACL. The specified amount of groundfish would be reapportioned in proportion to the original allocations for the calendar year, modified to account for Council recommendations with respect to sector needs. Reapportionment would be based on best available information, but would most likely occur later in the year after the September or November Council meetings.

Table 4-1 and Table 4-3 detail the deductions from the ACLs under the No Action Alternative for 2017 and 2018, respectively. The following paragraphs describe how off-the-top deductions were calculated under No Action. Table 4-2 and Table 4-4 detail the allocations analyzed under the No Action Alternative for 2017 and 2018, respectively. Table 4-5 details the deductions from the sablefish ACLs for the No Action Alternative. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-6.

Tribal Fishery: Tribal fisheries consist of trawl (bottom, midwater, and whiting), fixed gear, and troll. The requested tribal amounts are based on those in the 2016 regulations, modified based on tribal requests ([Agenda Item I.9.a, Supplemental Tribal Report, November 2015](#) and [Agenda Item I.9.a, Supplemental Tribal Report 2, November 2015](#)).

Research: Research activities include the NMFS trawl survey, International Pacific Halibut Commission longline survey, and other Federal and state research. The Council approach would be that off-the-top deductions should be equal to the maximum historical scientific research catch from 2005 to 2014, except for yelloweye rockfish. For yelloweye rockfish, the Council adopted a 3.3 mt research set-aside based on anticipated research needs of the International Pacific Halibut Commission (1.1 mt), Washington Department of Fish and Wildlife (1 mt), Oregon Department of Fish & Wildlife (1 mt), and other projects (0.2 mt). If data are available to determine that a set-aside has been exceeded during the fishing year, it would be evaluated by the Council and NMFS. Adjustments could be made to prevent the harvest specifications from being exceeded.

Incidental Open Access: Deductions from ACLs are made to account for groundfish mortality in the incidental open access fisheries. The off-the-top deductions for all species, except longnose skate, were derived from the maximum historical values in the 2007 to 2014 West Coast Groundfish Observer Program (WCGOP) Groundfish Mortality reports (see <http://tinyurl.com/nv3pddm>). The recommended set-aside for longnose skate was based on data from the 2009 to 2014 WCGOP Groundfish Mortality reports, the years in which longnose skate were reported separately from the Other Fish category.

Exempted Fishing Permits: The Council adopted the Nature Conservancy EFP that uses selective pot gear to harvest lingcod ([Agenda Item I.2, Supplemental Attachment 6, November 2015](#)), with the condition that activity be limited to those waters seaward of a line approximating the 75 fathom depth contour. No off-the-top deductions are required for this EFP, since those catches will be covered using QP allocated in the shorebased IFQ fishery or trip limits for non-IFQ species.

At the March 2016 meeting, the Council forwarded the 2017-2018 commercial jig fishing exempted fishing permit (EFP) application ([Agenda Item G.2, Attachment 1, March 2016](#)) for public review and possible final adoption at its June 2016 meeting with the following modifications: (1) include monitoring options of (a) 30 percent observer coverage, (b) 100 percent observer coverage; and (c) 30 percent observer coverage augmented by electronic monitoring; (2) extend the southern boundary for the EFP to Point Conception; (3) add up to three additional vessels to the EFP. The Council adopted set-asides as specified in 2015-16 and reduced the Oregon Department of Fish and Wildlife research set aside for yelloweye by the amount needed for this EFP (0.03 mt). The re-calculated fishery harvest guidelines and allocations will be provided in the June 2016 version of this document.

Recreational (sablefish north of 36° N. latitude only): The allocation framework for sablefish north of 36° N. latitude specifies that anticipated recreational catches of sablefish be deducted from the ACL prior to the commercial limited entry and open access allocations. The set-aside would be the maximum historical value from recreational fisheries from 2004 to 2014 (Table 4-37).

4.1.1.2 Allocating the Fishery HG

The fishery HGs for most species are further allocated between the trawl and non-trawl fisheries. The trawl and non-trawl allocations are based on the percentages adopted under Amendment 21 to the groundfish FMP or decided during the 2017-2018 biennium. Sablefish north of 36° N. latitude is allocated under the Amendment 6 framework, which allocates the commercial HG between the limited entry (trawl and fixed gear) and open access sectors. Further, the FMP outlines criteria for allocating Pacific whiting, darkblotched, POP, and widow between the shorebased IFQ, catcher-processor, and mothership sectors.

For some species, no allocations are necessary since ACL attainment has historically been low due to the lack of market demand, limited access as a result of the RCA configurations, or the need to limit overfished species interactions. Additionally, some species are managed and allocated by the west coast states (e.g., nearshore species).

For any stock that has been declared overfished, the formal trawl/non-trawl and open access/limited entry allocation established under provisions of the FMP and regulations (50 CFR 660.50) may be temporarily revised for the duration of the rebuilding period.

Two-year trawl and non-trawl allocations are decided during the biennial process for those species without long-term allocations or species where the long-term allocation is suspended. The ACLs and allocations for species subject to short-term allocations are indicated in Table 4-2 and Table 4-4. A summary of the basis for the two-year allocations are as follows

- Overfished species allocations were based on the September 2015 scorecard.
- Canary rockfish allocations were based on the September 2015 scorecard.
- Longnose skate was allocated 90 percent to the trawl fishery and 10 percent to the non-trawl fishery, based historical catch (see 2013-2014 EIS Appendix C, Table C-54).
- Big skate was allocated 95 percent to the trawl fishery and 5 percent to the non-trawl fishery, based historical catch from 2000-2015 ([Agenda Item I.9.a, Supplemental GMT Report 3, November 2015](#))
- Shelf rockfish north was allocated 60.2 percent to the trawl fishery and 39.8 percent to the non-trawl fishery, based historical catch from 2005-2008 (see 2011-2012 EIS, Appendix B)
- Shelf rockfish south was allocated 12.2 percent to the trawl fishery and 87.8 percent to the non-trawl fishery, based historical catch from 2005-2008 (see 2011-2012 EIS, Appendix B)

Table 4-1. No Action Alternative. Estimates of tribal, EFP, research (Res.), and incidental OA groundfish mortality in metric tons, used to calculate the fishery HG in 2017.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8	11,705.9
Black (WA)	Washington	305	18.0		-	-	287.0
Black (OR)	Oregon	527			-	0.6	526.4
Black (CA)	California	334					334.0
BOCACCIO	S of 40°10' N. lat.	790			4.6	0.8	784.6
Cabazon (OR)	46°16' to 42° N. lat.	47			-		47.0
Cabazon (CA)	S of 42° N. lat.	150			-	0.3	149.7
California scorpionfish	S of 34°27' N. lat.	264			0.2	2.0	261.8
Canary rockfish	Coastwide	1,714	35.0		7.2	1.2	1,670.6
Chilipepper	S of 40°10' N. lat.	2,607			10.9	5.0	2,591.1
COWCOD	S of 40°10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	406	0.2		2.5	24.5	378.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0	9,751.2
Lingcod	N of 40°10° N. lat.	3,333	250.0		11.7	16.0	3,055.3
Lingcod	S of 40°10° N. lat.	1,251			1.1	6.9	1,243.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34°27' N. lat.	2,894	30.0		13.5	3.3	2,847.2
Longspine thornyhead	S of 34°27' N. lat.	914			1.4	1.8	910.8
Nearshore rockfish north	N of 40°10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40°10' N. lat.	1,163			2.7	1.4	1,158.9
Shelf rockfish north	N of 40°10' N. lat.	2,049	30.0		24.8	26.0	1,968.2
Shelf rockfish south	S of 40°10' N. lat.	1,623			8.6	8.6	1,605.8
Slope rockfish north	N of 40°10' N. lat.	1,755	36.0		9.5	18.6	1,690.9
Slope rockfish south	S of 40°10' N. lat.	707			2.0	17.2	687.8
Other fish	Coastwide	474					474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0	8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2	2,895.1
POP	N of 40°10' N. lat.	171	9.2		5.2	10.0	146.6
Sablefish	N of 36° N. lat.	6,041			See Table 4-5		
Sablefish	S of 36° N. lat.	1,075			3.0	2.0	1,070.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34°27' N. lat.	1,713	50.0		7.2	1.8	1,654.0
Shortspine thornyhead	S of 34°27' N. lat.	906			1.0	41.3	863.7
Spiny dogfish	Coastwide	2,094	275.0		12.5	49.5	1,757.0
Splitnose rockfish	S of 40°10' N. lat.	1,760			9.0	0.2	1,750.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	2,000	200.0		8.2	0.5	1,791.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40°10' N. lat.	6,196	1,000.0		16.6	3.4	5,176.1

a/ The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-2. No Action Alternative. Stock-specific fishery HGs or ACTs and allocations for 2017 (in mt).

Species	Area	Fishery HG	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Black (WA)	N of 46°16'	287.0	None				
Black (OR)	46°16' to 42° N. lat.	526.4	None				
Black (CA)	S of 42° N. lat.	334.0	None				
BOCACCIO	S of 40°10' N. lat.	784.6	Biennial	N/A	188.6	N/A	596.0
Cabezon (OR)	46°16' to 42° N. lat.	47.0	None				
Cabezon (CA)	S of 42° N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	1,670.6	Biennial	N/A	890.0	N/A	780.6
Chilipepper	S of 40°10' N. lat.	2,591.1	Amendment 21	75%	1,943.3	25%	647.8
COWCOD b/	S of 40°10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	378.9	Amendment 21	95%	359.9	5%	18.9
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40°10' N. lat.	3,055.3	Amendment 21	45%	1,374.9	55%	1,680.4
Lingcod	S of 40°10' N. lat.	1,243.0	Amendment 21	45%	559.4	55%	683.7
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34°27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34°27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40°10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40°10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40°10' N. lat.	1,968.2	Biennial	60.2%	1,184.9	39.8%	783.3
Shelf rockfish south	S of 40°10' N. lat.	1,605.8	Biennial	12.2%	195.9	87.8%	1,409.9
Slope rockfish north	N of 40°10' N. lat.	1,690.9	Amendment 21	81%	1,369.6	19%	321.3
Slope rockfish south	S of 40°10' N. lat.	687.8	Amendment 21	63%	433.3	37%	254.5
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684	Amendment 21	100%	266,684	0%	0.0
Petrале sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40°10' N. lat.	146.6	Amendment 21	95%	139.3	5%	7.3
Sablefish	N of 36° N. lat.	0.0	See Table 4-5				
Sablefish	S of 36° N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34°27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34°27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,757.0	None				
Splitnose rockfish	S of 40°10' N. lat.	1,750.8	Amendment 21	95%	1,663.3	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	1,791.3	Amendment 21	91%	1,630.1	9%	161.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40°10' N. lat.	5,176.1	Amendment 21	88%	4,554.9	12%	621.1

a/ The California scorpionfish fishery harvest guideline (261.8 mt) would be further reduced to an annual catch target (ACT) of 111 mt.

b/ The cowcod fishery harvest guideline (8 mt) would be further reduced to an ACT of 4 mt.

c/ The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-3. No Action Alternative. Estimates of tribal, EFP, research (Res.), and incidental OA groundfish mortality in metric tons, used to calculate the fishery HG in 2018.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8	11,644.9
Black (WA)	Washington	301	18.0		-	-	283.0
Black (OR)	Oregon	520			-	0.6	519.4
Black (CA)	California	332					332.0
Blackgill rockfish	S of 40°10' N. lat.	123			0.5	0.1	122.4
BOCACCIO	S of 40°10' N. lat.	741			4.6	0.8	735.6
Cabezon (OR)	46°16' to 42° N. lat.	47			-		47.0
Cabezon (CA)	S of 42° N. lat.	149			-	0.3	148.7
California scorpionfish	S of 34°27' N. lat.	261			0.2	2.0	258.8
Canary rockfish	Coastwide	1,588	35.0		7.2	1.2	1,544.6
Chilipepper	S of 40°10' N. lat.	2,507			10.9	5.0	2,491.1
COWCOD	S of 40°10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	419	0.2		2.5	24.5	391.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0	7,324.2
Lingcod	N of 40°10' N. lat.	3,110	250.0		11.7	16.0	2,832.3
Lingcod	S of 40°10' N. lat.	1,144			1.1	6.9	1,136.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34°27' N. lat.	2,747	30.0		13.5	3.3	2,700.2
Longspine thornyhead	S of 34°27' N. lat.	867			1.4	1.8	863.8
Nearshore rockfish north	N of 40°10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40°10' N. lat.	1,179			2.7	1.4	1,174.9
Shelf rockfish north	N of 40°10' N. lat.	2,047	30.0		24.8	26.0	1,966.2
Shelf rockfish south	S of 40°10' N. lat.	1,624			8.6	8.6	1,606.8
Slope rockfish north	N of 40°10' N. lat.	1,754	36.0		9.5	18.6	1,689.9
Slope rockfish south	S of 40°10' N. lat.	586			2.0	17.2	566.8
Other fish	Coastwide	441					441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0	7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,013	220.0		17.7	3.2	2,772.1
POP	N of 40°10' N. lat.	176	9.2		5.2	10.0	151.6
Sablefish	N of 36° N. lat.	6,299			See Table 4-5		
Sablefish	S of 36° N. lat.	1,120			3.0	2.0	1,115.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34°27' N. lat.	1,698	50.0		7.2	1.8	1,639.0
Shortspine thornyhead	S of 34°27' N. lat.	898			1.0	41.3	855.7
Spiny Dogfish	Coastwide	2,083	275.0		12.5	49.5	1,746.0
Splitnose rockfish	S of 40°10' N. lat.	1,761			9.0	0.2	1,751.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	2,000	200.0		8.2	0.5	1,791.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40°10' N. lat.	6,002	1,000.0		16.6	3.4	4,982.1

^{a/} The Pacific whiting total allowable catch was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-4. No Action Alternative. Stock specific fishery HGs or ACTs and allocations for 2018 (in mt).

Species	Area	Fishery HG	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Black (WA)	N of 46°16'	283.0	None				
Black (OR)	46°16' to 42° N. lat.	519.4	None				
Black (CA)	S of 42° N. lat.	332.0	None				
Blackgill rockfish	S of 40°10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACIO	S of 40°10' N. lat.	735.6	Biennial	N/A	176.8	N/A	558.8
Cabezon (OR)	46°16' to 42° N. lat.	47.0	None				
Cabezon (CA)	S of 42° N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	1,544.6	Biennial	N/A	822.9	N/A	721.7
Chilipepper	S of 40°10' N. lat.	2,491.1	Amendment 21	75%	1,868.3	25%	622.8
COWCOD b/	S of 40°10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	391.9	Amendment 21	95%	372.3	5%	19.6
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40°10' N. lat.	2,832.3	Amendment 21	45%	1,274.5	55%	1,557.8
Lingcod	S of 40°10' N. lat.	1,136.0	Amendment 21	45%	511.2	55%	624.8
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34°27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34°27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40°10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40°10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40°10' N. lat.	1,966.2	Biennial	60.2%	1,183.7	39.8%	782.5
Shelf rockfish south	S of 40°10' N. lat.	1,606.8	Biennial	12.2%	196.0	87.8%	1,410.8
Slope rockfish north	N of 40°10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40°10' N. lat.	566.8		91%	515.8	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684	Amendment 21	100%	266,684	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,663.5	5%	138.6
POP	N of 40°10' N. lat.	151.6	Amendment 21	95%	144.0	5%	7.6
Sablefish	N of 36° N. lat.			See Table 4-5			
Sablefish	S of 36° N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34°27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34°27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,746.0	None				
Splitnose rockfish	S of 40°10' N. lat.	1,751.8	Amendment 21	95%	1,664.2	5%	87.6
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	1,791.3	Amendment 21	91%	1,630.1	9%	161.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40°10' N. lat.	4,982.1	Amendment 21	88%	4,384.2	12%	597.8

a/ The California scorpionfish fishery harvest guideline (258.8 mt) would be further reduced to an ACT of 111 mt.

b/ The cowcod fishery harvest guideline (8 mt) would be further reduced to an ACT of 4 mt.

c/ The Pacific whiting TAC was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-5. No Action Alternative. Estimates of tribal, research, recreational (Rec), and EFP mortality (in mt), used to calculate the fishery sablefish commercial harvest guideline north of 36° N. latitude for 2017 and 2018.

Stock	Year	ACL (mt)	Tribal Share (mt) ^{a/}	Research (mt)	Rec. (mt)	EFP (mt)	Commercial HG (mt)
Sablefish N. of 36° N. lat.	2017	6,041	604	26	6.1	0	5,405
	2018	6,299	630	26	6.1	0	5,637

^{a/} The sablefish allocation to Pacific coast treaty Indian Tribes would be 10 percent of the sablefish ACL for the area north of 36° N. lat. This allocation represents the total amount available to the treaty Indian fisheries before deductions for discard mortality.

Table 4-6. No Action: Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
-										
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFP c/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	188.6	57.3	1.4	0.2	359.9	106.5	139.3	45.0	1.1	0.1
--SB Trawl	188.6	57.3	1.4	0.2	341.0	97.6	122.0	39.1	1.1	0.1
--At-sea whiting MS					7.8	5.2	7.2	2.5		
--At-sea whiting CP					11.0	3.7	10.2	3.4		
Non-Trawl Allocation	596.0	169.8	2.6	2.2	18.9	7.2	7.3	0.5	12.9	12.1
Non-Nearshore	182.1	0.0		0.0		7.0		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.3	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	411.6	169.3		2.2		--		--	3.9	3.7
TOTAL	790.0	232.5	6.0	4.4	406.0	140.9	171.0	69.9	20.0	18.2
2017 Harvest Specification	790	790	10.0	10.0	406	406	171	171	20	20
Difference	0.0	557.5	4.0	5.6	0.0	265.1	0.0	101.1	0.0	1.8
Percent of ACL	100.0%	29.4%	60.0%	43.7%	100.0%	34.7%	100.0%	40.9%	100.0%	91.1%
Key			= not applicable							
		--	= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
-										
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFP c/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	176.8	53.7	1.4	0.2	372.3	106.8	144.0	45.2	1.1	0.0
--SB Trawl	176.8	53.7	1.4	0.2	353.0	97.9	127.0	39.3	1.1	0.0
--At-sea whiting MS					8.0	5.2	7.2	2.5		
--At-sea whiting CP					11.4	3.7	10.2	3.4		
Non-Trawl Allocation	558.8	169.8	2.6	2.2	19.6	7.5	7.6	0.5	12.9	12.1
Non-Nearshore	170.7	0.0		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.2	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	385.9	169.3		2.2		--		--	3.9	3.7
TOTAL	741.0	228.9	6.0	4.4	419.1	141.5	176.0	70.1	20.0	18.1
2017 Harvest Specification	741	741	10.0	10.0	419	419	176	176	20	20
Difference	0.0	512.1	4.0	5.6	-0.1	277.5	0.0	105.9	0.0	1.9
Percent of ACL	100.0%	30.9%	60.0%	43.7%	100.0%	33.8%	100.0%	39.8%	100.0%	90.7%
Key			= not applicable							
		--	= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

4.1.1.3 Harvest Guidelines

Accountability measures that increase the likelihood that total catch stays within the ACL include HGs, which are a specified numerical harvest objective that is not a quota. Attainment of an HG does not require closure of a fishery.

Blackgill Rockfish South of 40°10' N. Latitude

In 2017, blackgill rockfish is a component stock that would be managed within the Slope Rockfish complexes north and south of 40°10' N. latitude. In the south, blackgill rockfish is a precautionary zone stock and a 40:10 adjusted HG is established in the amount of 120 mt. The HG is subject to trawl/non-trawl allocations implemented under Amendment 21 (63 percent to trawl and 37 percent to non-trawl). The 44.5 mt blackgill rockfish share for the non-trawl sector is further allocated 60 percent to limited entry (27 mt) and 40 percent to open access fixed gears (18 mt). Analyses of these trip limits can be found in Section 4.1.1.6. This apportionment reflects the historical distribution of catch between the limited entry and open access fixed gear sectors from 2005 to 2010 (Table 3 in [Agenda Item E.9.b, GMT Report 2, November 2011](#)).

In November 2015, the Council recommended removing blackgill rockfish from the Slope Rockfish complex south of 40°10' N. latitude and establishing new Amendment 26 allocations for blackgill rockfish (41 percent to trawl and 59 percent to non-trawl) and the remaining species in the Slope Rockfish complex south of 40°10' N. latitude (91 percent to trawl and 9 percent to non-trawl). If the Council recommendation is approved by NMFS, the new configurations and allocations would begin in 2018, but would be implemented through a separate action. The Council also chose to examine two apportionment approaches for the 2018 fixed gear trip limits: the status quo (2016 approach) of 60 percent for limited entry and 40 percent for open access, and 70 percent for limited entry and 30 percent for open access. Analyses of these trip limits can be found in Section 4.1.1.6 and Table 4-28.

Blue Rockfish South of 42° N. Latitude

The blue rockfish harvest guideline for the area south of 42° N. latitude is the sum of three components: 1) the assessed stock's contribution to the Minor Nearshore Rockfish complex ABC (south of 40° 10' N. latitude), 2) the contribution for the unassessed portion south of Point Conception, and 3) the contribution to the Minor Nearshore Rockfish complex ABC for the area between 40° 10' N. latitude 42° N. latitude. For 2017 and 2018, this results in a 305 and 311 mt HG, respectively, for blue rockfish south of 42° N. latitude. The OFLs were derived from the 2007 assessment (Key et al. 2008), which was conducted for the portion of the stock in waters off California north of Point Conception at 34°27' N. latitude, plus the contribution for the unassessed area south of Point Conception. The ABCs were derived using a P* of 0.45 for category 2 stocks, which was then adjusted using the 40-10 default harvest policy, as specified in the FMP for species in the precautionary zone. The HG contribution for the unassessed portion of the stock south of Point Conception was calculated by first estimating an OFL using the depletion-corrected average catch (DCAC) methodology and then applying an ABC adjustment (using a P* of 0.45 for a category 3 stock). The HG contribution for the unassessed area was set equal to the ABC, since the stock is assumed to be above B_{MSY} .

Canary Rockfish

As described in Section 2.2.5, the latest canary rockfish assessment indicates that the stock is rebuilt. In addition to the two-year trawl and non-trawl allocations, state-specific HGs are established for the Washington, Oregon, and California recreational fisheries. Additionally, shares have been identified for

the nearshore and non-nearshore fisheries. Table 4-7 summarizes the canary rockfish allocations under No Action.

Table 4-7. No Action Allocations, HGs, and shares of Canary Rockfish.

Sector	2017	2018
Fishery Harvest Guideline	1,670.6	1,544.6
Trawl Allocation	890.0	822.9
<i>Shorebased IFQ</i>	<i>676.1</i>	<i>625.1</i>
<i>Catcher Processor</i>	<i>124.9</i>	<i>115.5</i>
<i>Mothership</i>	<i>89.0</i>	<i>82.3</i>
Non-Trawl Allocation	780.6	721.7
<i>Non-Nearshore</i>	<i>59.4</i>	<i>55.0</i>
<i>Nearshore Fixed Gear</i>	<i>104.8</i>	<i>96.9</i>
<i>Washington Recreational a/</i>	<i>53.2</i>	<i>49.2</i>
<i>Oregon Recreational a/</i>	<i>183.0</i>	<i>169.2</i>
<i>California Recreational a/</i>	<i>380.1</i>	<i>351.4</i>

Nearshore Rockfish North of 40°10' N. Latitude

The West Coast states propose to monitor and manage catches of Minor Nearshore Rockfish north of 40° 10' N. latitude using state-specific HGs. If harvest levels in a particular state approach 75 percent of the state-specific HGs, the states will consult via a conference call and determine whether inseason action would be needed. The HGs for Washington and Oregon would be state HGs and not established in Federal regulations. In California, the HG would be specified in Federal regulation and would apply only in the area between 42° N. latitude to 40°10' N. latitude. If inseason action were needed, the states of Washington and Oregon would take action through state regulation. California would propose changes through Federal regulations. Inseason updates would be provided to the Council at the September and November meetings.

The Council requested analysis of a range of state-specific Minor Nearshore Rockfish HGs north of 40° 10' N. latitude (Table 4-8). The status quo methodology for calculating the HG would use the same proportions of the state-specific HG as in 2016. That is, the northern Minor Nearshore Rockfish commercial HG would be allocated 12.7 percent to Washington, 58.6 percent to Oregon, and 28.7 percent to California. Under Option 1, the states would equally share the ACL contributions for the stocks without state assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states would receive 100 percent of the ACL contribution. For example, Washington would receive 100 percent of the ACL contribution of the Washington China rockfish assessment. Under Option 2, status quo proportions were used to allocate stocks without state-specific assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states would receive 100 percent of the ACL contribution. Analysis of the range of Nearshore Rockfish HG can be found in the description of the Nearshore Commercial, Washington Recreational, Oregon Recreational, and California Recreational fisheries that follows.

Table 4-8. Range of Nearshore Rockfish north of 40° 10' N. latitude HGs.

Stock	State	Option		
		No Action	Option 1	Option 2
Nearshore Rockfish North of 40°10' N. Lat.	WA	13.2	25.6	16.9
	OR	60.5	36.2	46.1
	CA	29.6	41.4	40.2

Range of Canary Rockfish Trawl and Non-Trawl Allocations

The 53 percent trawl and 47 percent non-trawl allocations of canary rockfish used in the integrated alternatives analysis are based on the biennial allocations for 2015-2016. The Council requested a range of allocations be explored including moving 5 to 15 percent of the canary rockfish allocation from the non-trawl sector to the trawl sector or establishing allocations that reflect historical allocations percentages from 1990 to present.

Range of Bocaccio Rockfish Trawl and Non-Trawl Allocations

The 24 percent trawl and 76 percent non-trawl allocations of bocaccio rockfish used in the integrated alternatives analysis are based on the biennial allocations for 2015-2016. The Council requested an analysis that would move from 5 to 15 percent of the bocaccio rockfish allocation to the trawl sector. The analysis indicates that the maximum amount (15 percent) could be moved from the non-trawl sector without disrupting current fishery operations. That is, no additional management measures would be necessary to keep catch within the non-trawl allocation even if the allocation were reduced by 15 percent.

State Quotas

In addition to Federal HGs, there are state quotas for nearshore species that further limit harvest in the commercial nearshore and recreational fisheries. In Oregon, the decision to allocate nearshore species between the commercial and recreational fisheries is made by the Oregon Fish and Wildlife Commission (Commission). The nearshore species that are allocated between the commercial and recreational fisheries by the Commission include kelp greenling, cabezon, black rockfish, and the rockfish species within the Federal minor nearshore rockfish complex. Decisions made by the Commission occur after final Council action to adopt the Federal harvest specifications and are implemented through state regulation only. To facilitate the analysis of the Federal action to establish harvest specifications (i.e., to ensure that the combined removals from the sport and commercial fisheries did not exceed Federal allocations to Oregon as a whole), assumptions were made about the possible state allocations of these nearshore species to the commercial and recreational fisheries (i.e., status quo percentages). These values are placeholders and do not presuppose future action by the Commission.

In California, allocations between the commercial and recreational fisheries are made by the Fish and Game Commission, with the authority to allocate nearshore rockfish, cabezon, and kelp greenling. These allocations were used to support analyses in development of management measures for Federal action.

HG Summary

Yield set-asides and HGs, including quotas established by state entities, are accountability measures that increase the probability that catches will remain at or below the ACLs. Table 4-9 summarizes the HGs proposed for use in management in 2017-2018.

Table 4-9. Harvest Guidelines for 2017-2018.

Species	Description	2017 (mt)	2018 (mt)
Blackgill S. of 40° 10' N. lat.	HG within the Non-Trawl Allocation of the Slope Rockfish complex South of 40° 10' N. lat.	120	N/A
Blue Rockfish S. of 42° N. lat.	HG within the Nearshore Rockfish complex North and South of 40° 10' N. lat.	305	311
Nearshore Rockfish 40° 10' N. lat. to 42° N.	HG within the Nearshore Rockfish complex North and South of 40° 10' N. lat.	29.6	29.6

4.1.1.4 Shorebased Individual Fishing Quota (IFQ) – No Action

Principle management measures for the shorebased IFQ fishery include:

- **Catch Controls:** IFQ and individual bycatch quota (IBQ) for Pacific halibut north of 40° 10' N. latitude are the primary catch control tools in the shorebased IFQ fishery. South of 40° 10' N. latitude, Pacific halibut would be managed with a set-aside. The 2014 IFQ and IBQ used in the analysis of No Action can be found in Table 4-10 and 4-2. Additionally, cumulative monthly landing limits (hereinafter trip limits) for non-IFQ species and Pacific whiting outside the primary season dates apply to each vessel (see regulations Table 1 North and South to Part 660, Subpart D). Once a vessel reaches a limit, the species or species complex can no longer be retained and sold.
- **Accumulation limits:** The maximum number of quota shares (QS) and quota pounds (QP) an entity may control in the shorebased IFQ fishery is limited by accumulation limits (defined in regulation at 50 CFR 660.111). These limits vary according to the management unit for the stock or stock complex and are intended to prevent the consolidation of quota holdings by just a few entities.
- **Carryover provision:** The carryover provision allows a limited amount of surplus QP or IBQ pounds in a vessel account to be carried over from one year to the next or allows a deficit in a vessel account in one year to be covered with QP or IBQ pounds from a subsequent year, up to a carryover limit. The carryover provision is anticipated to increase individual flexibility for harvesters, improve economic efficiency, and achieve OY while preserving the conservation of stocks. The eligible percentages used for the carryover provision may be modified during the biennial specifications and management measures process or based on a Council inseason recommendation, pending NMFS approval. Species eligible for potential issuance of surplus carryover include those where the ABC is larger than the ACL.
- **Monitoring and Reporting:** All trips in the shorebased IFQ fishery are monitored at sea by the WCGOP and landings are tracked by electronic fish tickets, verified by catch monitors. Together, these two programs provide robust, near-real time tracking and reporting of IFQ species and Pacific halibut IBQ.
- **Gear Restrictions:** IFQ species may be harvested with groundfish trawl or legal groundfish non-trawl gear. Trawl gear restrictions prohibit certain types of gear that may be used in rocky habitat, reducing habitat impacts and also limiting overfished species bycatch for those species that inhabit rocky substrate. Further, gear restrictions minimize catch of overfished species while allowing sufficient access to target species. For example, the selective flatfish trawl net, which is required shoreward of the trawl RCA north of 40° 10' N. latitude, reduces rockfish bycatch while efficiently catching flatfish. Scottish seine gear is exempted from trawl RCA closures in the area between 38° N. latitude and 36° N. latitude and depths less than 100 fm because the gear has demonstrated low

bycatch rates of overfished species. IFQ species can also be harvested with legal non-trawl gears.

- RCAs: Vessels harvesting IFQ must abide by RCA closures, which are specified by gear type. For example, vessels fishing with legal groundfish non-trawl gear must abide by the non-trawl RCA, while vessels fishing with bottom trawl gear must abide by the trawl RCA. These RCA features were designed to provide sufficient access to target species while minimizing bycatch of overfished species.
- Bycatch Reduction Areas: Bycatch on Pacific whiting trips can be mitigated by implementing bycatch reduction areas. These area restrictions apply to vessels on Pacific whiting trips using midwater gear during the primary whiting season and limit fishing to depths greater than any of the specified management lines between 75 fm and 150 fm (see regulations at 660.131(c)(4) Subpart D).
- Ocean Conservation Zones: Chinook salmon bycatch on Pacific whiting trips can be mitigated by implementing the ocean salmon conservation zones. These zones apply to vessels on Pacific whiting trips using midwater gear during the primary whiting season and restrict fishing to depths seaward of 100 fm.
- Other Groundfish Conservation Areas (GCA) – Several other GCAs exist and provide overfished species and habitat protection. Though limited bottom trawling occurs south of Point Conception at 34° 27' N. latitude in the Southern California Bight, bottom trawling and other bottom fishing activities are prohibited in two discrete areas called the Cowcod Conservation Areas (CCAs) (Figure 4-1.a). Closed EFH areas are used to protect bottom habitat from the adverse effects of trawl gear (see regulations at 660.75). Three areas off the Washington coast are designed to reduce bycatch of yelloweye rockfish. North Coast Area B and South Coast Area B are closed to commercial fishing (Figure 4-1.a and b). South Coast Area A is a voluntary “area to be avoided” for commercial groundfish fisheries.

Impact (Groundfish Mortality)

The projected groundfish mortality for IFQ species under No Action, as a result of implementing the above-mentioned management measures can be found in Table 4-10 and 4-2, as well as mortality estimates for 2013 and 2014 for comparison. Description of the projection model used for this sector (Matson and Taylor 2015) can be found in Appendix C. Groundfish mortality of non-IFQ species is not projected using a model; however, historical data from 2013 and 2014 are provided for comparison (Table 4-3).

The difference in projected mortality resulting from the No Action Alternative versus the average for 2013 and 2014 varies among species by between a few percent (e.g. Dover sole) to as much as 50 times (for canary rockfish), although projections for most species are quite similar to 2013-2014 estimates. Since the canary rockfish stock was determined to be rebuilt with the new assessment in 2015, allocations under all alternatives have increased dramatically, to levels that should enable targeted fishing of this desirable species. The projected mortality for widow rockfish and bocaccio has also risen dramatically, coincident with large increases in their allocations under all alternatives including No Action. Total catch of widow rockfish is projected to double (compared with 2013 and 2014) under No Action, while bocaccio catch is projected to increase five times. The 2015 bocaccio stock assessment predicted the stock would be rebuilt by the start of 2016. The Alternative 1 and 2 widow rockfish ACLs are higher in the 2017-18 cycle, after a lag following its rebuilt status determination (due to reapportionment issues related to its change in status from bycatch to target).

For these species (bocaccio, canary rockfish, and widow rockfish), historical data from the late 1990s (when the OYs and harvest guidelines were in a similar range of the alternatives, the stocks were not overfished, and species-specific tracking and management were in use) were used to supplement the model reference

data, since the alternatives were well out of range of any allocations under IFQ years. The addition of supplemental historical data was necessary to reasonably inform projections, and it also added uncertainty. Allocation levels under the alternatives are much higher for these species than under IFQ management. During the most recent time period when the amount of fish available to the trawl fishery was in the same range as the alternatives (late 1990s), a much higher proportion of the amount available to the trawl fishery was taken (formal trawl allocations did not exist in the 1990s). An assumption made when using these data was that the relevant market conditions and other constraints (e.g. bycatch) will either be similar enough, or surmountable enough in the current management regime of IFQ, to enable similar proportions of the allocations to be harvested in 2017 and 2018, as informed by the historical data. All data were year-weighted, and model sensitivity was evaluated. Uncertainty and use of historical data are both explained further in Appendix A, Model Descriptions.

Pacific halibut IBQ north of 40° 10' N. latitude

The shorebased IFQ program keeps this sector's bycatch of Pacific halibut IBQ (north of 40° 10' N. latitude) within expectations by requiring that trawlers account for their total mortality of all halibut in round weight (legal- and sublegal-sized). Therefore, to determine a trawl bycatch mortality limit, the amount of halibut pounds available to the trawl fleet is determined annually by converting the expected legal-sized halibut mortality (net weight) into a round weight legal + sublegal-sized amount. To achieve this, the following conversions are applied.

- Net weight to round weight conversion: multiply by the IPHC net weight to round weight conversion factor in use at the time of each year's calculation.
- Legal to legal + sublegal-sized conversion factor: multiply by the ratio of legal-sized halibut to legal + sublegal-sized halibut from the most up-to-date NMFS analysis of trawl fishery bycatch available at the time of each year's calculation.

After these conversions, 10 mt is subtracted to cover bycatch mortality in the at-sea whiting fishery and trawl fishery south of 40° 10' N. lat., and the remainder is issued as IBQ, used by vessels operating in the program.

The formula used to calculate the Pacific halibut trawl bycatch mortality limit and allocation for this sector is specified in the Groundfish FMP at Section 6.3.2.3 under "Allocation of Pacific Halibut" and in the U.S. Codified Federal Regulations (CFR) for groundfish at 50 CFR part 660.55(m). From 2015 forward, 15 percent of the Area 2A total catch exploitation yield (TCEY) for legal-sized halibut (net weight), not to exceed 100,000 pounds, is subtracted from the TCEY to account for expected trawl bycatch mortality of legal-sized halibut (net weight). This means the cap is evaluated before conversions are applied, and is the same under all alternatives. Under the current cap level and 2016 conversion rates, the result is that any TCEY for Area 2A higher than 666,667 pounds yields no further increase to the annual Pacific halibut IBQ mortality limit for the IFQ program. The TCEY used in the calculation is determined by the IPHC annually. The bycatch allocation percent can be adjusted downward or upward (above or below 15 percent) through the biennial specifications and management measures process but the upper bound on the maximum allocations can only be changed through an FMP amendment.

Non-IFQ species

Recent catches (2013 and 2014) for non-IFQ species are shown in Table 4-3, to serve as guidance in lieu of projections, since no model exists for these species. Under No Action, big skate is classified as an EC species and is managed with trip limits (Table 4-13).

Table 4-10. No Action – Shorebased IFQ. Projected mortality for IFQ species and Pacific halibut IBQ under No Action (2017 values), compared to the allocations or set-asides. Year-end estimates of mortality for 2013 and 2014 are provided for reference (right panel).

IFQ Species	Area	No Action 2017		Historical Mortality a/	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	2013 SB IFQ Mortality (mt)	2014 SB IFQ Mortality (mt)
Arrowtooth flounder	Coastwide	2,302.2	11,050.6	2,433.9	1,734.8
BOCACCIO	South of 40°10' N. lat.	57.3	188.6	12.9	9.0
Canary rockfish	Coastwide	538.6	676.1	10.2	10.5
Chilipepper	South of 40°10' N. lat.	353.8	1,943.3	395.0	312.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.22	0.20
DARKBLOTCHED	Coastwide	97.6	341.1	116.3	97.8
Dover sole	Coastwide	7,062.1	45,981.0	7,975.6	6,495.1
English sole	Coastwide	240.7	9,258.6	220.6	237.5
Lingcod	North of 40°10' N. lat.	315.4	1,359.9	340.2	239.2
Lingcod	South of 40°10' N. lat.		559.4	16.7	18.7
Longspine thornyheads	North of 34°27' N. lat.	942.7	2,699.8	1,089.0	898.6
Minor Shelf Rockfish	South of 40°10' N. lat.	66.5	1,149.9	29.8	34.1
Minor Shelf Rockfish	North of 40°10' N. lat.	15.5	195.9	20.2	9.7
Minor Slope Rockfish	North of 40°10' N. lat.	260.6	1,269.6	195.6	184.1
Minor Slope Rockfish	South of 40°10' N. lat.	119.5	433.3	117.4	99.1
Other Flatfish	Coastwide	1,549.2	7,455.4	801.7	840.2
Pacific cod	Coastwide	156.5	1,031.4	154.1	166.0
Pacific halibut c/	North of 40°10' N. lat.	26.1	84.5	33.0	27.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.1	121.9	49.0	40.5
Pacific whiting b/	Coastwide	83,693.1	112,007.3	97,621.3	98,714.1
PETRALE SOLE	Coastwide	2,620.2	2,745.3	2,130.0	2,313.5
Sablefish	North of 36° N. lat.	2,660.0	2,790.1	1,850.8	1,884.3
Sablefish	South of 36° N. lat.	143.9	449.4	90.7	206.2
Shortspine thornyheads	North of 34°27' N.	695.0	1,551.3	828.1	683.2
Shortspine thornyheads	South of 34°27' N.	2.5	50.0	3.7	2.7
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,663.3	46.2	67.1
Starry flounder	Coastwide	10.0	630.9	3.5	14.7
Widow rockfish	Coastwide	1,078.8	1,340.1	411.6	654.0
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.06	0.06
Yellowtail rockfish	North of 40°10' N. lat.	1,401.5	4,254.9	719.3	1,163.6

a/ Historical estimates of mortality were generated using the NMFS Pacific Coast IFQ Program Database (January 2015). Pacific whiting values include inseason allocation reapportionments.

b/ The 2016 Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

c/ Pacific halibut is managed using IBQ, see regulations at §660.140. The 2016 Pacific halibut TAC was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-11. No Action – Shorebased IFQ. Projected mortality for IFQ species and Pacific halibut IBQ under No Action (2018 values), compared to the allocations or set-asides. Year-end estimates of mortality for 2013 and 2014 are provided for reference (

IFQ Species	Area	No Action 2018		Historical Mortality a/	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	2013 SB IFQ Mortality (mt)	2014 SB IFQ Mortality (mt)
Arrowtooth flounder	Coastwide	2,299.8	10,992.6	2,433.9	1,734.8
BOCACIO	South of 40°10' N. lat.	53.7	176.8	12.9	9.0
Canary Rockfish	Coastwide	498.0	625.1	10.2	10.5
Chilipepper	South of 40°10' N. lat.	353.8	1,868.3	395.0	312.3
COWCOD	South of 40°10' N. lat.	0.17	1.4	0.22	0.20
DARKBLOTCHED	Coastwide	97.9	352.8	116.3	97.8
Dover sole	Coastwide	7,062.1	45,981.0	7,975.6	6,495.1
English sole	Coastwide	220.2	6,953.0	220.6	237.5
Lingcod	North of 40°10' N. lat.	291.0	1,259.5	340.2	239.2
Lingcod	South of 40°10' N. lat.		511.2	16.7	18.7
Longspine thornyheads	North of 34°27' N. lat.	939.5	2,560.2	1,089.0	898.6
Minor Shelf Rockfish	South of 40°10' N. lat.	66.4	1,148.7	29.8	34.1
Minor Shelf Rockfish	North of 40°10' N. lat.	15.5	196.0	20.2	9.7
Minor Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	195.6	184.1
Minor Slope Rockfish	South of 40°10' N. lat.	101.5	357.1	117.4	99.1
Other Flatfish	Coastwide	1,319.3	6,349.3	801.7	840.2
Pacific cod	Coastwide	156.5	1,031.4	154.1	166.0
Pacific halibut c/	North of 40°10' N. lat.	26.1	84.5	33.0	27.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.3	126.6	49.0	40.5
Pacific whiting b/	Coastwide	83,693.1	112,007.3	97,621.3	98,714.1
PETRALE SOLE	Coastwide	2,508.7	2,628.5	2,130.0	2,313.5
Sablefish	North of 36° N. lat.	2,776.3	2,912.1	1,850.8	1,884.3
Sablefish	South of 36° N. lat.	149.9	468.3	90.7	206.2
Shortspine thornyheads	North of 34°27' N.	694.5	1,537.0	828.1	683.2
Shortspine thornyheads	South of 34°27' N	2.5	50.0	3.7	2.7
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,664.2	46.2	67.1
Starry flounder	Coastwide	10.0	630.9	3.5	14.7
Widow rockfish	Coastwide	1,078.8	1,340.1	411.6	654.0
YELLOWEYE ROCKFISH	Coastwide	0.08	1.1	0.06	0.06
Yellowtail rockfish	North of 40°10' N. lat.	1,347.9	4,084.2	719.3	1,163.6

a/ Historical estimates of mortality were generated using the NMFS Pacific Coast IFQ Program Database (January 2015). Pacific whiting values include inseason allocation reapportionments.

b/ The 2016 Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

c/ Pacific halibut is managed using IBQ, see regulations at §660.140. The 2016 Pacific halibut TAC was unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-12. Recent mortality estimates for non-IFQ stocks in the shorebased IFQ fishery (mt).

Stock	2013	2014
Big Skate	138	388
California Skate	6	2
Grenadier Unidentified	105	61
Groundfish Unidentified	0	0
Longnose skate	985	901
Pacific Flatnose	8	2
Pacific Grenadier	218	85
Shortbelly rockfish	25	17
Skate Unidentified	17	21
Soupin Shark	2	5
Spiny Dogfish Shark	638	613
Spotted Ratfish	109	96

Table 4-13. Big skate trip limits coastwide for shorebased IFQ fishery for 2017-2018.

JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
5,000	25,000	30,000	35,000	10,000	5,000

Table 4-14. Trawl RCA configuration in regulation as of February 3, 2016.

Area	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
North of 48°10' N. lat.	shore - modified/ 200 fm line	shore - 200 fm line	shore - 150 fm line		shore - 200 fm line	shore - modified 200 fm line
48°10' N. lat. - 45°46' N. lat.	100 fm line - 150 fm line					
45°46' N. lat. - 40°10' N. lat.	100 fm line - modified 200 fm line					
South of 40°10' N. lat.	100 fm line - 150 fm line					

Table 4-15. Non-Trawl RCA configuration in regulation as of February 3, 2016.

Area	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
North of 46°16' N. lat.	shoreline - 100 fm line					
46°16' N. lat. - 42°00' N. lat.	30 fm line - 100 fm line					
42°00' N. lat. - 40°10' N. lat.	20 fm depth contour - 100 fm line ¹					
40°10' N. lat. - 34°27' N. lat.	30 fm line - 150 fm line					
South of 34°27' N. lat.	60 fm line - 150 fm line					

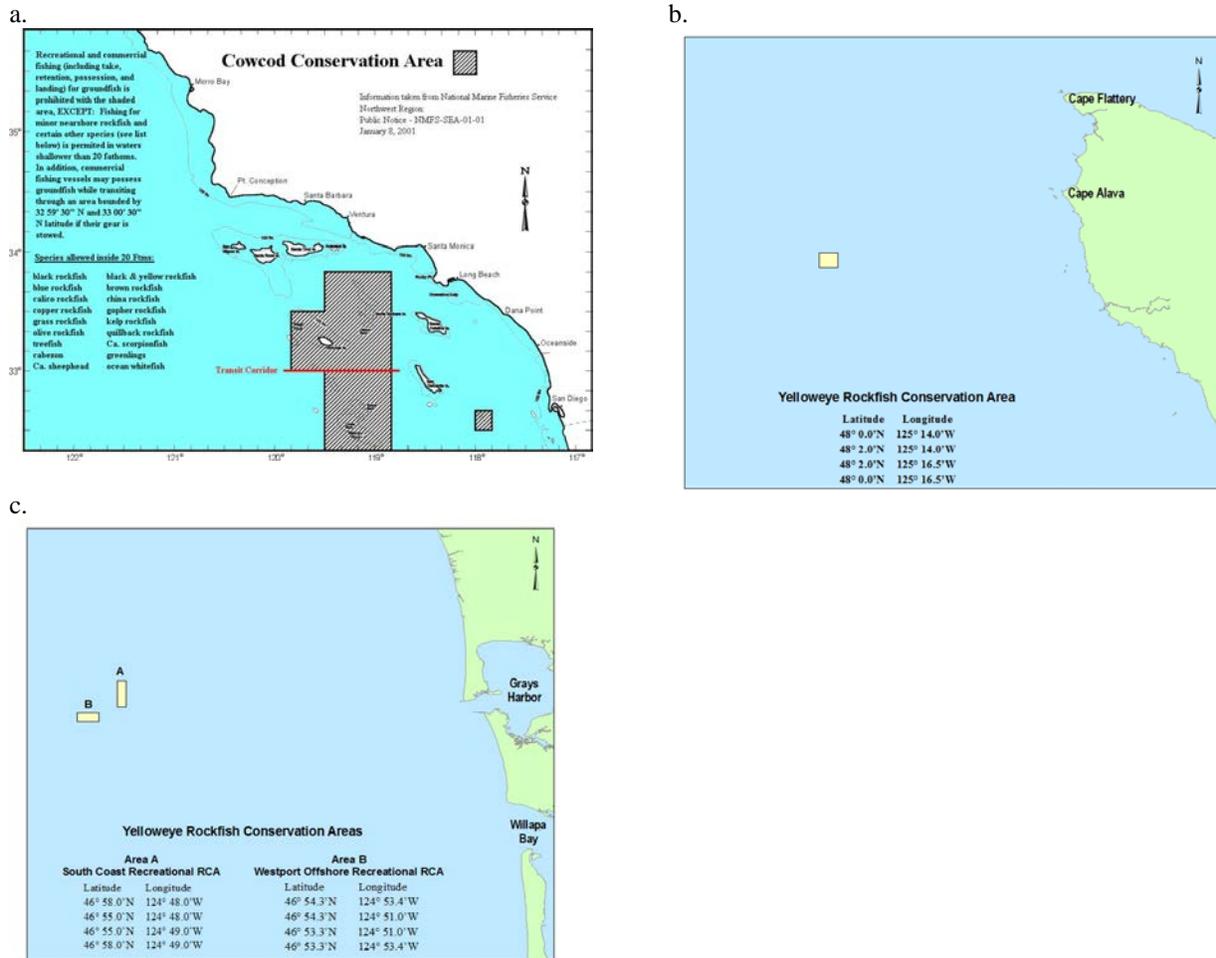


Figure 4-1. No Action – Selected GCAs. a. The current Cowcod Conservation Areas located in the Southern California Bight; b. North Coast Area B, a Yelloweye Rockfish Conservation Area in northern Washington; c. South Coast Area A and B, Yelloweye Rockfish Conservation Areas in southern Washington. South Coast Area A is an area to be voluntarily avoided.

4.1.1.5 At-Sea Whiting Co-ops – No Action

The at-sea sector is composed of catcher-processors and motherships that target Pacific whiting with midwater trawl gear and process at sea. Management measures include allocations for Pacific whiting,

canary rockfish, darkblotched rockfish, Pacific ocean perch (POP), and widow rockfish, and set-asides for bycatch species. Further, measures are established that restrict the Pacific whiting season dates and provide for bycatch reduction areas and ocean salmon conservation zones (see regulations at 660.131).

The at-sea sector is managed under a system of cooperatives (co-ops) that are similar to IFQs except that the harvest privilege is assigned to a group, the co-op, instead of an individual. The members of the group then decide how and when the collectively-held harvest privilege would be used. The trawl rationalization program establishes a set of rules for the formation of co-ops in the at-sea mothership sector that provide a strong incentive for catcher vessels to form co-ops associated with a mothership processor (see regulations at 50 CFR 660.150). In the case of the catcher-processor sector, a single, voluntary co-op has been in existence for some time. In that instance, the allocation to the sector is essentially an allocation to the co-op. Further, a catcher-processor permit endorsement is required, which essentially closes this sector to new entrants; a move intended to lend greater stability to the functioning of the current, voluntary co-op. Regulations at 50 CFR 660.160 further outline the catcher-processor co-op provisions.

Impact (Groundfish Mortality)

Under No Action, the 2017-2018 ACLs for non-whiting species would be established using default harvest control rules (Section 2.1.1). The catcher-processor and mothership co-op allocations for darkblotched rockfish, POP, and widow rockfish would be derived based on the percentages outlined in section 6.3.2.3 of the FMP and regulations at 660.55 (Table 4-16). For canary, two-year allocations are established. For Pacific whiting, the 2015 TAC and associated allocations were used as a proxy for the analysis since the 2017-2018 TAC is established in another process and is not yet available. The allocations may be considered the highest estimate of groundfish mortality since the fishery is managed to stay within the allocations. Alternatively, groundfish mortality in the at-sea sectors can be projected by using a bycatch rate approach or a bootstrap simulation (see Appendix A for model documentation). Table 4-17 shows projections for both catcher-processors and motherships using the average historical bycatch rate from 2011-2014, positively weighted for more recent years, applied to the 2015 whiting TAC as a proxy. Table 4-18 and Table 4-19 use a bootstrap simulation to determine the distribution of bycatch compared to the allocations (Table 4-16) as well the risk of not attaining the whiting TAC. The bootstrap simulation uses individual whiting haul data from 2000-2015. 10,000 simulations were run on the data, with each individual simulated season first randomly selecting a year (e.g., 2003) and then resampling from all individual non-zero (i.e., at least some whiting was caught) hauls within the selected year until a season closure occurred. A closure was only simulated if a sector was projected to either: 1) attain the whiting TAC, or 2) exceed the POP, widow, or darkblotched allocation. Note that due to the wide range of canary allocation alternatives, canary harvest was not restricted during the bootstrap simulation. Historically, canary catches have been quite low in both the mothership and catcher-processor sectors and have not been constraining. Unless behavior were to shift dramatically, the bootstrap simulation should inform the allocation that would not constrain the at-sea fleet. In the projections below, it can be understood that a certain percentage of the time, the sector is projected to land the corresponding value or less as these are a distribution of results. In other words, in Table 4-18, the column labeled 90 percent means that 90 percent of the simulations would land 10.3 mt or less of POP, or that 10 percent of the simulations exceed 10.3 mt and therefore the POP allocation.

Set-asides for bycatch species would be established based on values present in 2016 regulations and if needed, increased to cover the highest of 2014 and 2015 catches (Table 4-20). The Other Fish complex contains nearshore species which are not typically encountered in the at-sea whiting sectors. As such, the Council determined it was not necessary to specify an Other Fish complex set-aside. A range of spiny dogfish set-asides from 163 mt to 725 mt was analyzed in the 2015-2016 EIS along with a risk analysis for all sectors of exceeding the spiny dogfish ACL (see Section B.16, Appendix B). Given the low risk of

exceeding the spiny dogfish ACL, the Council did not recommend spiny dogfish set-asides for the at-sea sectors. A similar approach was used for the 2017-2018 cycle.

Table 4-16. No Action – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under the No Action Alternative for 2017-2018. Historical mortality for 2013 and 2014 by sector is provided (right panel) for reference.

Stock	Area	No Action Allocation				Historical Mortality for CPs and MS b/			
		2017 CP (mt)	2018 CP (mt)	2017 MS (mt)	2018 MS (mt)	2013 CP (mt)	2014 CP (mt)	2013 MS (mt)	2014 MS (mt)
Canary rockfish	Coastwide	124.9	115.5	89.0	82.3	0.2	0.3	0.3	0.4
DARKBLOTCHED	Coastwide	11	11.4	7.8	8.0	2.1	3.4	4.2	7.2
POP	N of 40°10' N. lat.	10.2	10.2	7.2	7.2	4.3	0.3	0.5	3.6
Pacific whiting a/	Coastwide	90,673	90,673	64,004	64,004	78,041	103,266	52,522	62,038
Widow rockfish	Coastwide	170	170	120	120	15.7	4.1	15.5	39.6

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

b/ Pacific whiting mortality estimates were derived from the WCGOP GM Reports and include inseason reapportionments of whiting from the tribal sectors.

Table 4-17: No Action- At-Sea. Projections for the CP and MS sectors under the No Action Alternative for 2017-2018 using average historical bycatch rates (positively weighted for more recent years). No Action allocations are provided on the right for reference.

Stock	Area	No Action Allocation a/				2017/2018 Projection	
		2017 CP (mt)	2018 CP (mt)	2017 MS (mt)	2018 MS (mt)	CP (mt)	MS (mt)
Canary rockfish	Coastwide	124.9	115.5	89.0	82.3	0.3	0.4
DARKBLOTCHED	Coastwide	11	11.4	7.8	8.0	3.7	5.2
POP	N of 40°10' N. lat.	10.2	10.2	7.2	7.2	3.4	2.5
Pacific whiting	Coastwide	90,673	90,673	64,004	64,004	90,673	64,004
Widow rockfish	Coastwide	170	170	120	120	28.2	36.1

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-18: No Action- At-Sea- Catcher-Processor. Landing projections for the CP sector under the No Action Alternative for 2017-2018 using the bootstrap methodology. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations.

Stock	CP All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	90,673	20,699	35,393	53,388	89,201	90,673	90,673	90,673	90,673	90,673	90,673
DARKBLOTCHED	11	0.3	1.2	1.7	2.6	4.8	7.1	9.4	11	12.1	13.6
POP	10.2	0.1	0.2	0.3	1	4.6	8.1	10.3	10.8	12.4	14.4
Widow rockfish	170	3.5	5.7	8.4	14.1	30.5	67	97.2	119	195.3	248.4
Canary rockfish	124.9	0	0.1	0.1	0.2	0.4	0.6	1.1	2.1	3.8	7.3

Table 4-19: No Action- At-Sea- Mothership. Projections for the MS sector under the No Action Alternative for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. No Action allocations are provided on the right for reference. Bolded text indicates values that are higher than the allocations.

Stock	MS All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	64,004	14,536	26,272	39,460	59,164	64,004	64,004	64,004	64,004	64,004	64,004
DARKBLOTCHED	7.8	0.2	0.5	1	2.2	4.3	6.1	7.8	7.9	9.1	10.7
POP	7.2	0.1	0.1	0.3	0.9	1.8	3.4	5.3	7.2	8.1	9.7
Widow rockfish	120	1.6	11.7	15.4	22.7	46	70.1	96	120.2	126.2	143.6
Canary rockfish	89.0	0.1	0.1	0.1	0.3	0.6	1.1	1.9	2.2	12.3	31.9

Table 4-20. No Action – At-Sea. At-sea whiting set-asides and allocations under the No Action Alternative (adopted by the Council in November 2015). Historical mortality for the catcher-processor (CP) and mothership sectors (MS) and the 2016 set-asides in regulations are provided for reference.

No Action Set-Asides			2016 Total Set- Asides	Historical Mortality for CPs and MS a/		
Stock	Area	Total Set- Asides (mt)		2013 (mt)	2014 (mt)	Average 2011-2014 (mt)
PETRALE SOLE	Coastwide	5	5	0.0	0.0	0.0
YELLOWEYE	Coastwide	0	0	0.0	0.0	0.0
Arrowtooth flounder	Coastwide	70	45	14.5	10.7	27.8
Dover sole	Coastwide	5	5	1.1	0.9	0.8
English sole	Coastwide	5	5	0.1	0.0	0.0
Lingcod	N of 40°10' N. lat.	15	15	1.5	0.9	0.7
Longnose skate	Coastwide	5	5	0.6	0.8	0.5
Longspine thornyhead	N of 34°27' N. lat.	5	5	0.0	0.0	0.1
Pacific cod	Coastwide	5	5	0.0	0.0	0.0
Pacific halibut b/	Coastwide	10	10	0.0	0.2	0.3
Sablefish	N of 36° N. lat.	50	50	12.7	16.1	9.7
Shortspine thornyhead	N of 34°27' N. lat.	20	20	0.3	20.4	8.8
Starry flounder	Coastwide	5	5	0.0	0.0	0.0
Yellowtail rockfish	N of 40°10' N. lat.	300	300	269.4	44.5	109.5
Shelf Rockfish north	N of 40°10' N. lat.	35	35	1.8	0.3	1.0
Slope Rockfish north	N of 40°10' N. lat.	100	100	44.6	25.4	59.0
Other Fish	Coastwide	N/A	N/A	12.1	8.2	7.3
Other Flatfish	Coastwide	20	20	0.0	0.0	0.0

a/ WCGOP Groundfish Mortality Reports.

b/ As stated in §660.55 (m), the Pacific halibut set-aside is 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each).

4.1.1.6 Limited Entry and Open Access Fixed Gear Management – No Action

Table 4-21 and Table 4-22 summarizes the principle management measures for the limited entry and open access fixed gear vessels. The sablefish stock is the primary target, in terms of volume and revenue, for both the limited entry and open access fixed gear sectors. A variety of nearshore species (e.g., black rockfish, Nearshore Rockfish complex, cabezon, lingcod, and kelp greenling) are targeted by a large number of vessels, but in relatively low volume.

One non-trawl RCA is implemented for the limited entry and open access fixed gear fisheries (Table 4-21 and Table 4-22). Routine RCA adjustments can be made for four northern subareas bounded by Cape Mendocino at 40° 10' N. latitude, 43° N. latitude, Cascade Head, Point Chehalis at 46.888° N. latitude, and the U.S.-Canada border. These adjustments may be necessary inseason to reduce projected catches of non-target species, typically yelloweye rockfish, while providing access to target species. RCA adjustments can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation (e.g., changing from 125 to 100 fm).

The non-trawl RCA seaward boundary south of 40° 10' N. latitude under the No Action Alternative is defined by management lines specified with waypoints at roughly 150 fathoms (fm) to avoid areas where bocaccio, canary rockfish, and yelloweye rockfish are most abundant.

Other GCAs include the North Coast Area B Yelloweye Rockfish Conservation Area (YRCA) in Washington, which has been closed to limited entry and open access fixed gears since 2007 (Figure 4-1.b). Additionally, the South Coast Areas A and B YRCAs and the “C-shaped” YRCA in waters off northern Washington are voluntary “areas to be avoided” (Figure 4-1.c and Figure 4-2). Fishing is not allowed in the CCAs (Figure 4-1.a) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in Section 4.1.1.6 under the Nearshore section.

The models used project overfished species catches in the limited entry and directed open access fisheries and inform management measures are stratified by area of fishing shoreward (nearshore) or seaward (non-nearshore) of the non-trawl RCA (see Appendix A). Therefore, the estimates of groundfish mortality under No Action and the action alternatives are presented using the same strata.

Table 4-21. No Action – Limited Entry Fixed Gear. Summary of limited entry fixed gear fishery management measures under the No Action Alternative.

Cumulative limits	<ul style="list-style-type: none"> • Cumulative trip limits for most species, specific to geographic area (See regulations Table 2 North and South to Part 660, Subpart E). Changes to the 2016 trip limits include sablefish in Table 4-26 and Table 4-27, blackgill rockfish in Table 4-28, yellowtail rockfish in Table 4-30 , shelf rockfish complex in Table 4-31, black rockfish in Table 4-50, California scorpionfish in Table 4-52, bocaccio in Table 4-34, and canary rockfish in Table 4-47. • Primary sablefish fishery managed with tier limits in Table 4-23. • YELLOWEYE ROCKFISH landings prohibited coastwide • South of 40°10' N. latitude landings of cowcod and bronzespotted rockfish prohibited
Size limits	<p><u>Lingcod</u></p> <ul style="list-style-type: none"> • North of 42° N. lat. minimum size limit 22 inches total length • South of 42° N. lat. minimum size limit 24 inches total length
Gear restrictions	<ul style="list-style-type: none"> • Longline, trap or pot marked at the surface, at each terminal end, with a pole, flag, light, radar reflector, and a buoy • Must be attended at least once every 7 days • Traps must have biodegradable escape panels
Seasons	<ul style="list-style-type: none"> • Primary sablefish fishery from 4/1 to 10/31 • Permit stacking of up to 3 permits is allowed in primary sablefish fishery • Additional seasonal restrictions may be implemented via routine action or the fishery may “close” for some species or some areas during the year through inseason action
GCAs	<p><u>YRCA</u></p> <ul style="list-style-type: none"> • North Coast Commercial YRCA (WA) closed to commercial fixed gears • North Coast Recreational YRCA (WA) is a voluntary area to be avoided • Westport Offshore Recreational YRCA (WA) is a voluntary area to be avoided
	<p><u>CCA</u> Fishing is prohibited in CCAs with the following exceptions:</p> <ul style="list-style-type: none"> • Fishing for “Other Flatfish” when using no more than 12 hooks, #2 or smaller • Fishing for rockfish and lingcod shoreward of 20 fm
	<ul style="list-style-type: none"> • Farallon Islands commercial fishing for groundfish is prohibited shoreward of 10 fm with the following exceptions: Fishing for “Other Flatfish” when using no more than 12 hooks, #2 or smaller • Cordell Banks Commercial fishing for groundfish is prohibited in depths less than 100 fm
	<p><u>EFH</u> Fishing with all bottom contact gear, including longline and pot/trap gear, is prohibited within the following EFH conservation areas: Thompson Seamount, President Jackson Seamount, Cordell Bank (50 fm (91 m) isobath), Harris Point, Richardson Rock, Scorpion, Painted Cave, Anacapa Island, Carrington Point, Judith Rock, Skunk Point, Footprint, Gull Island, South Point, and Santa Barbara. Fishing with bottom contact gear is also prohibited within the Davidson Seamount</p>
Limited Entry Non-trawl RCAs	<ul style="list-style-type: none"> • <u>North of 46°16' N. lat.</u> Shoreline to 100 fm • <u>46°16'- 42° N. lat.</u> 30 to 100 fm • <u>42°-40°10' N. lat.</u> 30 fm depth contour to 100 fm • <u>40°10'-34°27' N. lat.</u> – 30 to 150 fm • <u>South of 34°27' N. lat.</u> – 60 to 150 fm <p>Fishing is prohibited in non-trawl RCAs with the following exception: Fishing for “Other Flatfish” when using no more than 12 hooks, #2 or smaller</p>
Monitoring	<ul style="list-style-type: none"> • VMS required • WCGOP observer coverage when requested
Reporting	<ul style="list-style-type: none"> • VMS declarations

Table 4-22. No Action – Open Access. Summary of open access fishery management measures under the No Action Alternative based on regulations.

Cumulative limits	<ul style="list-style-type: none"> • Cumulative trip limits for most species, specific to gear type and geographic area (See regulations Table 3 North and South to Part 660, Subpart E) Changes to existing trip limits include sablefish in Table 4-26 and Table 4-27, blackgill rockfish in Table 4-28, yellowtail rockfish in Table 4-30, shelf rockfish complex in Table 4-31, black rockfish in Table 4-50, California scorpionfish in Table 4-52, bocaccio in Table 4-35 and canary rockfish in Table 4-47. • YELLOWEYE ROCKFISH landings prohibited coastwide • South of 40°10' N. latitude landings of cowcod and bronzespotted rockfish prohibited
Gear restrictions	<ul style="list-style-type: none"> • Longline, trap, pot, hook-and-line (fixed or mobile), setnet (anchored gillnet or trammel net (south of 38° N. lat. only), spear, and non-groundfish trawl gear for: pink shrimp, ridgeback prawn, and California halibut or sea cucumbers (south of Pt. 38°57.50' N. lat.) <p><u>Non-groundfish trawl gear:</u></p> <ul style="list-style-type: none"> • Is exempt from the limited entry trawl gear restrictions • Footrope (>19") prohibited in EFH closed areas <p><u>Fixed gear:</u></p> <ul style="list-style-type: none"> • Must be marked at the surface, at each terminal end, with a pole, flag, light, radar reflector, and a buoy; vertical hook-and-line gear that is closely tended may be marked only with a single buoy of sufficient size to float the gear • Must be attended at least once every 7 days • Fishing for groundfish with set nets is prohibited in the fishery management area north of 38°00.00' N. lat. • Traps must have biodegradable escape panels • Spears may be propelled by hand or by mechanical means
Seasons	Seasonal restrictions may be implemented via routine action or the fishery may “close” for some species or some areas during the year through inseason action
GCAs	<p><u>YRCA</u></p> <ul style="list-style-type: none"> • North Coast Commercial YRCA (WA) closed to commercial fixed gears • North Coast Recreational YRCA (WA) is a voluntary area to be avoided • Westport Offshore Recreational YRCA (WA) is a voluntary area to be avoided • Salmon Troll YRCA. Fishing for salmon is prohibited
	<p><u>CCA</u> Fishing is prohibited in CCAs with the following exceptions:</p> <ul style="list-style-type: none"> • Fishing for “Other Flatfish” when using no more than 12 hooks, #2 or smaller • Fishing for rockfish and lingcod shoreward of the 20 fm
Open Access non-trawl RCAs	<ul style="list-style-type: none"> • <u>North of 46°16' N. lat.</u> Shoreline to 100 fm • <u>46°16'- 42° N. lat.</u> 30 to 100 fm • <u>42°-40°10' N. lat.</u> 30 fm to 100 fm • <u>40°10'-34°27' N. lat.</u> – 30 to 150 fm • <u>South of 34°27' N. lat.</u> – 60 to 150 fm <p>Fishing is prohibited in non-trawl RCAs with the following exception: Fishing for “Other Flatfish” when using no more than 12 hooks, #2 or smaller</p>
Monitoring	<ul style="list-style-type: none"> • VMS required • WCGOP observer coverage when requested
Reporting	<ul style="list-style-type: none"> • VMS declarations

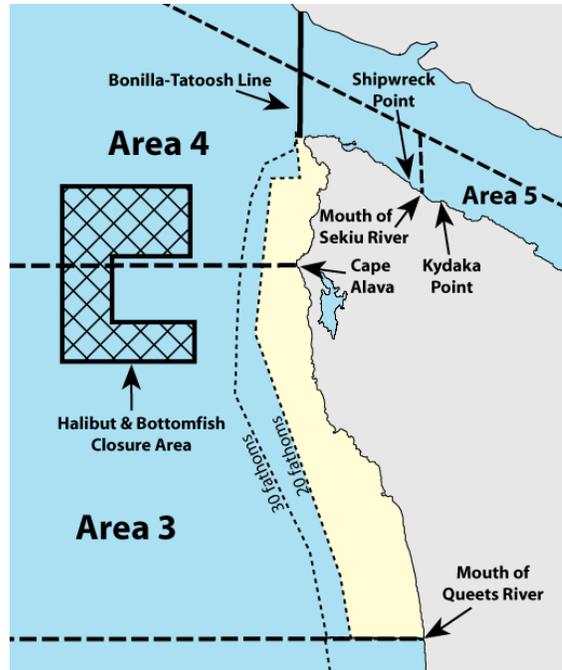


Figure 4-2. No Action. The current “C-shaped” Yelloweye Rockfish Conservation Area in waters off northern Washington where recreational groundfish and Pacific halibut fishing is prohibited.

Trip Limit Analysis

Sablefish

Table 4-23 and Table 4-24 summarize the FMP allocations of sablefish for limited entry and open access north of 36° N. latitude under No Action. South of 36° N. latitude, the FMP allocation of sablefish is 42 percent to the trawl sector and 58 percent to the non-trawl sector. A short-term allocation between the limited entry and open access fixed gear sectors of 55 percent and 45 percent, respectively, would be established. An alternative allocation between sectors of 75 percent to limited entry and 25 percent to open access is also being considered under No Action (Table 4-25). Trip limits intended to attain the allocations under No Action can be found in Table 4-26 for north of 36° N. latitude and Table 4-27 for both two-year allocation alternatives for south of 36° N. latitude.

Table 4-23. No Action: Limited entry sablefish FMP allocations north of 36° N. latitude, based on the default harvest control rule.

Year	Sablefish Com. HG	LE Share	LEFG Share (mt)				Estimated Tier Limits (lbs) a/		
			LE FG Total Catch Share	Landed Catch Share a/	Primary Season Share	LEFG DTL Share	Tier 1	Tier 2	Tier 3
2017	5,405	4,897	2,057	1,983	1,685	297	51,956	23,616	13,495
2018	5,637	5,107	2,145	2,068	1,758	310	54,188	24,631	14,075

a/ The limited entry fixed gear total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-24. No Action: Open access FMP allocations north of 36° N. latitude, based on the default harvest control rule.

Year	OA Total Catch Share (mt)	Directed OA Landed Catch Share (mt) a/
2017	508	490
2018	530	511

a/ The open access total catch share is reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-25. No Action: Short-term sablefish allocations south of 36° N. latitude for the non-trawl sector, limited entry and open access under no action sharing alternative (55 percent to limited entry; 25 percent to open access) and alternative sharing of 75 percent to limited entry; 25 percent to open access.

Year	Commercial HG	Non-Trawl Allocation	Ratio of Limited Entry: Open Access	LE FG Total Catch Share	Directed OA Total Catch Share	LE FG Landed Catch Share a/	Directed OA Landed Catch Share
2017	1,070	621	55:45	341	279	329	269
			75:25	465	155	449	150
2018	1,143	647	55:45	356	291	343	281
			75:25	485	162	468	156

a/ The limited entry and open access fixed gear total catch shares are reduced by the anticipated discard mortality of sablefish, based on WCGOP data from 2002 to 2013. In 2017-2018, 18 percent of the sablefish caught are anticipated to be discarded and 20 percent are expected to die.

Table 4-26. No Action . Sablefish trip limits (lbs) north of 36° N. latitude for limited entry and open access fixed gears.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec
Limited Entry	1,125 weekly/3,375 bimonthly					
Open Access	300 daily/ 1,400 bimonthly/ 2,800 bimonthly					

Table 4-27. No Action . Sablefish trip limits (lbs) south of 36° N. latitude for limited entry and open access fixed gears with informal share noted in parenthesis.

Fishery	Jan-Feb	Mar-Apr	May-Jun	July-Aug	Sept-Oct	Nov-Dec
Limited Entry (55%)	1,500/week					
Limited Entry (75%)	1,700/week					
Open Access (45%)	300 daily/ 1,600 weekly/ 3,200 bimonthly					
Open Access (25%)	300 daily/ 1,600 weekly/ 3,200 bimonthly					

Blackgill Rockfish

In November 2015, the Council recommended removing blackgill rockfish from the slope rockfish complex (south of 40° 10' N. latitude) and manage it with its own separate stock specific specifications beginning in 2018. Amendment 21 allocations (63 percent to trawl and 37 percent to non-trawl) apply to the entire slope rockfish complex south of 40° 10' N. latitude for 2017. In 2018, Amendment 26 allocations apply for blackgill rockfish (41 percent to trawl and 59 percent to non-trawl) and the slope rockfish complex south of 40° 10' N. latitude (91 percent to trawl and 9 percent to non-trawl) individually. The Council also chose to examine two apportionment approaches for the 2018 trip limits: the status quo (2016 approach) 60 percent for the LE fixed-gear sector and 40 percent for the OA sector, and a 70 percent/30 percent apportionment for the LE and OA sectors, respectively. Trip limits for 2017 will remain at the status quo amounts which are the 2016 values in regulation (Table 4-28).

Table 4-28. No Action: Blackgill rockfish trip limits, south of 40° 10' N. latitude for 2017 and 2018 for non-trawl fixed gear sectors.

2017 Trip Limits (pounds)						
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
LE	1,375	1,375	1,375	1,600	1,600	1,600
OA	475	475	475	550	550	550
2018 LE Trip Limits (pounds)						
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
LE at 60%						
No Action	1,375	1,375	1,375	1,600	1,600	1,600
Option 2a	2,500	2,500	2,500	2,500	2,500	2,500
Option 3a	2,750	2,750	2,750	2,750	2,750	2,750
LE at 70%						
Option 2b	3,000	3,000	3,000	3,000	3,000	3,000
Option 3b	3,250	3,250	3,250	3,250	3,250	3,250
2018 OA Trip Limits (pounds)						
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
OA at 40%						
No Action	475	475	475	550	550	550
Option 2a	1,000	1,000	1,000	1,000	1,000	1,000
Option 3a	1,500	1,500	1,500	1,500	1,500	1,500
OA at 30%						
Option 2b	900	900	900	900	900	900
Option 3b	1,200	1,200	1,200	1,200	1,200	1,200

Canary Rockfish

Under No Action, the canary rockfish share to the non-nearshore fishery for 2017 and 2018 is 59.4 mt and 55 mt, respectively. The proposed trip limits for canary rockfish, described within the Nearshore Section (below) and Appendix B, of 300 lbs per two months for LE and 100 lbs per two months for OA are projected to be sufficient to allow non-nearshore fishermen the opportunity to retain the majority of their bycatch. While these trips limits could also accommodate the non-nearshore fleet to begin targeting canary rockfish, this is not expected to happen since historical catch rates (landings) of canary rockfish when targeting could occur in the 1990s are similar to the recent catch rates (bycatch) from which retention was prohibited; thus indicating that when they were allowed to target, they did not.

Yellowtail Rockfish

Yellowtail rockfish is managed as a single stock north of 40°10' N. latitude and is subject to Amendment 21 allocations for the trawl and non-trawl sectors of 88 percent and 12 percent, respectively. Yellowtail rockfish is not formally allocated within non-trawl sectors; that is, the non-trawl commercial LE and OA sectors, as well as the recreational sector, share the non-trawl allocation. The 2017 and 2018 non-trawl allocations north of 40°10' N. latitude are expected to decrease slightly (621.1 mt and 597.8 mt, respectively) compared to the 2016 allocation of 637.7 mt.

Historically, yellowtail rockfish was a target species for both the LE and OA sectors, but landings declined dramatically with implementation of the RCAs to protect overfished rockfish species. From 2011 to 2014, landings in the non-trawl LE and OA sectors have been minimal, averaging less than 1.3 mt per year per vessel. The recreational sector accounted for the majority of yellowtail rockfish mortality in the non-trawl sector, averaging 44.4 mt from 2011-2014 (Table 4-29). Between 2013-2014, only one OA vessel landed

between 30 and 35 percent of the annual maximum amount allowed (2,400 pounds), with all other vessels (LE and OA) landing approximately 10 percent or less of their theoretical maximum amount.

Table 4-29. Total mortality (mt) of yellowtail rockfish in the non-trawl sector north of 40°10' N. latitude, 2011-2014. (data sources: WCGOP)

Year	Commercial Non-trawl (LE and OA)	Recreational	Total	Non-trawl allocation	% Non-trawl allocation
2011	2.4	51.8	54.2	463.8	11.7%
2012	2.4	36.01	38.41	464.6	8.3%
2013	2.1	35.78	37.88	441.2	8.6%
2014	2.9	45.8	48.7	441.7	11.0%

Note: The above commercial values include discard mortality estimates.

Table 4-30 summarizes monthly trip limits and projected impacts for LE and OA sectors north of 40°10' N. latitude under a range of trip limit options. Trip limits range from 400-1,000 lb per month for LE and 300-500 lb per month for OA. Because the non-trawl allocation for yellowtail rockfish complex applies to the entire area north of 40°10' N. latitude, modifications to trip limits north of 40°10' N. latitude were investigated that would apply to the three states. Recreational estimates in Table 4-30 are the average catch from 2011-2014, derived from the annual groundfish mortality reports produced by WCGOP. At the March 2016 meeting, the Council approved an alternative that would allow midwater long-leader recreational groundfish fishing seaward of a line approximating the 40 fm depth curve exclusively off the coast of Oregon (42°00' N. lat. to 46°18' N. lat.) from April-September to target abundant and healthy midwater species while avoiding or minimizing interactions with overfished rockfish species. Supplemental analysis is underway to inform revised yellowtail rockfish mortality estimates for the Oregon recreational fisheries and Table 4-30 will be updated accordingly. Commercial landings assume an estimate discard mortality using a proxy calculated from 2011 and 2014 (WCGOP data). For analytical and managerial ease, monthly limits are assumed the same in each month. The years 2011 through 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior, since the 2015 data aren't available. Projected landings also assume that no or very few additional vessels will participate in the fishery, and those that have participated in the recent fishery will continue to do so.

Table 4-30. Summary of Limited Entry and Open Access monthly trip limits (in lbs) and projected impacts (mt) for non-trawl yellowtail rockfish north of 40°10' N. latitude. Also included is the average recreational mortality from 2011-2014 as a proxy for the projection.

Option	LE/OA Trip limits (pounds)	Projected mortality (mt)			Total projected mortality (mt) a/	Percent of 2017 non-trawl allocation
		LE	OA	Recreational		
No Action	200/200	0.6	1.8	42.4	44.8	7.2%
Opt. 1	400/300	0.9	2.3		45.6	7.3%
Opt. 2	500/400	1.1	2.8		46.3	7.5%
Opt. 3	1,000/500	1.9	3.3		47.6	7.7%

a/ Projected mortalities are based on average landings during 2011-2014. For the combined recreational estimate, a four-year average was derived from the 2011-2014 West Coast Groundfish Observer Program annual groundfish mortality reports.

Although there could be a minor increase in the bycatch of overfished species as a result of increasing trip limits, the amount cannot be quantified. An increase in trip limits could increase some fishing effort but associated overfished species impacts are expected to be minimal because yellowtail rockfish is a schooling fish that tends to be found higher in the water column than those overfished species. Other species typically caught with yellowtail rockfish include sablefish, black rockfish, lingcod, rougheye rockfish, and blue

rockfish. Of these top five species caught with yellowtail rockfish from 2011 to 2014, black rockfish is one that could experience increased catches which may cause it to exceed its harvest limit.

Accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the OA sector because the fishery is unrestricted. These same uncertainties are eliminated or are much lower in the LE sector where effort is limited and fishing behavior is somewhat more easily predicted.

Shelf Rockfish (between 40°10' N. latitude and 34°27' N. latitude)

Although shelf rockfish are managed as a complex for the entire area south of 40°10' N. latitude, trip limit options analyzed herein are only for the management area between 40°10' N. latitude and 34°27' N. latitude for the OA non-trawl fixed-gear sector. Shelf rockfish are not formally allocated within non-trawl sectors, that is, the non-trawl commercial LE and OA sectors, as well as the recreational sector, share the non-trawl allocation. The 2017 and 2018 non-trawl allocations (1,623 mt and 1,624 mt, respectively) are slightly less than the 2016 allocation of 1,625 mt.

Table 4-31 summarizes bi-monthly trip limits for the OA sector between 40°10' and 34°27' N. latitude and corresponding projected impacts for the entire non-trawl sector south of 40°10' N. latitude. For analytical and managerial ease, bi-monthly limits are assumed the same in each period for options 1 and 2. The years 2013 and 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior. Average commercial landings between 40°10' and 34°27' N. latitude during this time period and the 2014 recreational total mortality reported by WCGOP for the area between 40°10' N. latitude and 34°27' N. latitude were added to the analytical options to project mortality for this area. Note that in all trip limit options, Period 2 is closed.

Table 4-31. No Action bi-monthly trip limits options (pounds) for the Shelf Rockfish complex between 40°10' and 34°27' N. latitude for the open access sector and overall non-trawl impacts (mt).

Alternative	Commercial			Recreational	Total	Non-trawl allocation	% of non-trawl allocation
	Trip limits	OA est. mort.	LE est. mort.				
No Action/a	200/300	17.9	2.24	349.0	369.1	1,409.9	26.2%
Opt. 1	400	27.3			378.5		26.8%
Opt. 2	500	33.8			385.0		27.3%

a/ Trip limits are 200 lb/period for Periods 3 and 4 and 300 lb/period for Periods 1, 5, and 6.

Although no effort shift occurred during previous inseason actions, participation in the OA sector has traditionally been more unpredictable than LE, making it difficult to predict catch and fleet behavior; therefore, it is possible that projected landings could be higher than expected if the trip limit is increased sufficiently enough to encourage entry into the fishery by new participants.

Because the OA shelf rockfish trip limit also includes vermilion, and widow rockfishes and chilipepper, consideration was given to the projected impacts to those species, which are well below allowable limits. Vermilion rockfish mortality under No Action is estimated to be 10.7 mt, with that estimate to increase to 21.3 mt under the proposed 500 pound trip limit. For widow rockfish, the No Action estimate is 14.0 mt, with an estimated increase to 27.8 mt at the proposed 500 pound trip limit amount. For chilipepper, the No Action estimate is 0.6 mt, with an estimated increase to 1.1 mt at the proposed 500 pound trip limit. It is likely that the trip limit increase will have an effect on canary rockfish, although the exact amount cannot be quantified. The Council is considering allowing retention of canary rockfish in commercial fixed gear fisheries and the amount of additional impacts to canary rockfish as a result of allowing higher trip limits for shelf rockfish will likely be dependent on those decisions. In other words, depending on the trip limits

chosen for canary rockfish, there may be no additional impacts to canary rockfish as a result of allowing higher shelf rockfish trip limits.

There may be a small increase in the bycatch of overfished species, but at present, no quantifiable method has been explored to determine how much this may be. Any increase in trip limits is expected to increase fishing effort for Shelf Rockfish species, but the amount of the increase is uncertain and cannot be estimated at this time. As noted in prior trip limit analyses, accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the OA sector because the fishery is unrestricted.

Bocaccio

Bocaccio is managed as a single stock for the entire area south of 40°10' N. latitude under two-year trawl and non-trawl allocations. The non-trawl allocation is further sub-divided between the fixed gear sectors and the recreational sector, which is managed under a harvest guideline. Trip limits for limited entry and open access sectors have historically been divided north and south of 34°27' N. latitude - presumably due to differences in encounter rates.

The No Action trip limits for the limited entry fishery between 40°10' – 34°27' N latitude have been in place since June 2007. Prior to 2007, differential trip limits were in effect for shelf rockfish species that caused high discard levels in an attempt to reach all the individual limits ([Agenda Item E.7.b, Supplemental GMT Report, June 2007](#)). Combining the limits was done to allow more flexibility in retention opportunities and reduce overall discard. Since that time, widow rockfish has rebuilt and bocaccio is nearly rebuilt. Allowing for higher individual limits for bocaccio (i.e., removing it from the aggregate shelf rockfish trip limits between 40°10' – 34°27' N. latitude) will help reduce discarding as this stock continues to rebuild and encounters increase.

The 2017 non-trawl allocation for bocaccio south of 40°10' N. latitude is expected to be 790.0 mt and for 2018, 741.0 mt. The No Action bi-monthly cumulative trip limits are summarized in Table 4-32 and Table 4-33. This trip limit analysis proposes to provide trip limits for the LE and OA sectors independent of having bocaccio trip limits as part of the Shelf Rockfish complex.

Recent participation (2013 and 2014) in the LE fixed-gear fishery between 40°10' N. latitude and 34°27' N. latitude was limited, with only three vessels making any bocaccio landings during this time period. A total of 16 LE vessels made landings south of 34°27' N. latitude, with only one vessel landing more than 1,000 pounds total for either year. In the OA sector, 59 vessels landed bocaccio between 40°10' N. latitude and 34°27' N. latitude and 35 made landings south of 34°27' N. latitude. All commercial landings data are derived from PacFIN.

Table 4-32. No Action limited entry trip limits (in pounds) for bocaccio south of 40°10' N. latitude.

	Period 1 Jan/Feb	Period 2 Mar/Apr	Period 3 May/June	Period 4 Jul/Aug	Period 5 Sept/Oct	Period 6 Nov/Dec
Minor Shelf Rockfish, Shortbelly, Widow rockfish (including Bocaccio and Chilipepper between 40°10' – 34°27' N. lat.)						
40°10' – 34°27'	Minor shelf rockfish, shortbelly, widow rockfish, bocaccio & chilipepper: 2,500 lb/2 mo, of which no more than 500 lb may be species other than chilipepper.					
Bocaccio						
40°10' – 34°27'	Bocaccio included under Minor shelf rockfish, shortbelly, widow rockfish & chilipepper limits - see above					
South of 34°27'	750lb/2 months	Closed	750 lb/2 months			

Table 4-33. No Action open access trip limits (in pounds) for bocaccio south of 40° 10' N. latitude.

	Period 1 Jan/Feb	Period 2 Mar/Apr	Period 3 May/June	Period 4 Jul/Aug	Period 5 Sept/Oct	Period 6 Nov/Dec
40°10' – 34°27'	200 lb/2 mo	Closed	100 lb/2 mo		200 lb/2 mo	
South of 34°27'	250 lb/2 mo	Closed	250 lb/ 2 mo			

Table 4-34 summarizes bi-monthly trip limits (in pounds) for the LE sector between 40° 10' and 34° 27' N. latitude and south of 34° 27' N. latitude and corresponding projected impacts for the sector. Bi-monthly trip limits range from 500 to 1,500 lb per two months. For analytical and managerial ease, bi-monthly limits are assumed the same in each period with the exception of the closed period 2 (March/April) south of 34° 27' N. latitude. The years 2013 and 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior. Because there were so few data to model for the LE sector between 40° 10' N. latitude and 34° 27' N. latitude, no real mortality estimates could be generated by model runs. Therefore, only one proposed trip limit option is provided (Option 1), and that is to double the No Action amount of 500 pounds to 1,000 pounds per two-month period. Because the No Action mortality estimate is so low (0.3 mt), it can be reasonably assumed that even with a trip limit that is doubled to 1,000 pounds, the estimated mortality will still be so low that even when combined with the other sectors' mortality it will remain within prescribed levels. This is due, in part, to the low number of vessels that are expected to participate in this fishery.

Table 4-34. Bocaccio bi-monthly trip limits (in pounds) for the LE sector for the two regions of California south of 40° 10' N. latitude and estimated mortality (mt).

40°10' – 34°27'	Trip limit	Estimated mortality
No Action	500	0.3
Option 1	1,000	NA
South of 34°27'		
	Trip limit	Estimated mortality
No Action	500	3.0
Option 1	1,250	5.0
Option 2	1,500	5.9

Note: Commercial data from PacFIN.

Table 4-35 summarizes bi-monthly trip limits for the OA sector between 40° 10' and 34° 27' N. latitude and south of 34° 27' N. latitude and corresponding projected impacts for the sector. Bi-monthly trip limits range from 100 to 800 lb per two months. For analytical and managerial ease, bi-monthly limits are assumed the same in each period with the exception of the closed period 2 (March/April). The years 2013 and 2014 were chosen as the basis for this model because they may better represent current and future fishing behavior.

Table 4-35. Bocaccio bi-monthly trip limits (in pounds) for the OA sector for the two regions of California south of 40°10' N. latitude and estimated mortality (mt).

40°10' – 34°27'	Trip limit	Estimated mortality
No Action	200/100	1.6
Option 1	500	4.9
Option 2	800	7.8
South of 34°27'		
South of 34°27'	Trip limit	Estimated mortality
No Action	250	2.8
Option 1	400	4.4
Option 2	800	8.8

Note: Commercial data from PacFIN.

Table 4-36 provides a summary of all the sectors' mortality estimates (mt) combined by sector and area compared to the 2018 non-trawl allocation of 558.8 mt. This table essentially combines the mortality estimates from Table 4-34 and Table 4-35 and provides an overall total mortality estimate.

Table 4-36. Summary mortality estimates (mt) for bocaccio rockfish by sector and area compared to the 2018 non-trawl commercial LE and OA allocation.

Location and Options	LE	OA	Total	2018 Non-Trawl Allocation	% of allocation
40°10' – 34°27'				558.8	
No Action	0.3	1.6	1.9		0.3%
Option 1	NA	4.9	NA		NA
Option 2	NA	7.8	NA		NA
South of 34°27'					
No Action	3.0	2.8	5.8		1.0%
Option 1	5.0	4.4	9.4		1.7%
Option 2	5.9	8.8	14.7	2.6%	

Note: Commercial data from PacFIN.

Although very little effort shift occurred during previous inseason actions, participation in the OA sector has traditionally been more unpredictable than LE, making it difficult to predict catch and fleet behavior; therefore, it is possible that projected landings could be higher than expected if the trip limit is increased sufficiently enough to encourage entry into the fishery by new participants.

It is likely that trip limit increases can have an effect on canary rockfish and cowcod, although the exact amount cannot be quantified. The Council is considering allowing retention of canary rockfish in commercial fixed gear fisheries and the amount of additional impacts to canary rockfish as a result of allowing higher trip limits for bocaccio will likely be dependent on those decisions. In other words, depending on the trip limits chosen for canary rockfish, there may be no additional impacts to this species

as a result of allowing higher bocaccio trip limits. As noted in prior trip limit analyses, accurately predicting the effects (e.g., effort, fishing behavior, latent capacity) of increased trip limits is difficult in the OA sector because the fishery is unrestricted.

Impact (Groundfish Mortality) – Non-Nearshore North of 36° N. latitude

The non-nearshore model projects mortality of overfished and non-overfished species for the limited entry fixed gear and the open access sectors north of 36° N. latitude and seaward of the non-trawl RCA based on the northern sablefish ACL. The sablefish north stock is the primary target and provides the main source of revenue in both sectors. The bycatch projections are based on the assumption that the limited entry and open access allocations for sablefish are completely harvested.

Historically, interactions with overfished species, primarily yelloweye rockfish and canary rockfish, have required adjustments to management measures in the non-nearshore fisheries. Seaward adjustments of the non-trawl RCA boundary are the main management measure for reducing catches of these two stocks. Changes to the shoreward boundary (e.g., changing from 150 to 100 fm) can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation. Furthermore, if our assumptions about canary rockfish are incorrect (i.e. greater amounts are targeted compared to the past), trip limit adjustments and changes to the RCA boundary can be made even though not considered overfished.

Management measures and projected mortality for the non-nearshore fishery north of 36° N. latitude under No Action is largely influenced by the sablefish ACL, which would be calculated with a P* of 0.40 with a 40:10 adjustment (Section 2.1.1, Table 2-1), and the resulting sablefish allocations (Table 4-23 and Table 4-24). Current trip limits (Table 4-26) would be routinely adjusted to achieve the limited entry and open access sablefish allocations (Table 4-23 and Table 4-24). Trip limits for other species (e.g., Slope Rockfish, Shelf Rockfish, etc.) may also be adjusted to attain the ACL or achieve other conservation goals.

The projected species mortality, as a result of harvesting the sablefish allocations, was evaluated using 2002-2013 WCGOP data in the non-nearshore model (Table 4-39 and Table 4-40). However, canary projections were developed by examining a 300 pound bimonthly trip limit for limited entry and a 100 pound bimonthly trip limit for open access, which was intended to allow the fixed gear fleet to retain previously discarded canary rockfish (Appendix B). Under No Action, trawl and non-trawl allocations were established for overfished species. Further, the non-nearshore fishery was also allocated a share of the non-trawl allocation for bocaccio and yelloweye (Table 4-38). Routine adjustments of the seaward non-trawl RCA (Table 4-21 and Table 4-22) would occur in the event the projected overfished species mortality is expected to exceed the non-nearshore share or non-trawl allocation (Table 4-38). Projected mortality for yelloweye is 0.8 mt for 2017 and 2018 compared to the 0.7 mt share (Table 4-38). By moving the RCA from 100 fm to 125 fm, the projected mortality for yelloweye is reduced to 0.45 mt for 2017 and 0.47 mt for 2018.

However, the non-nearshore fishery has historically not attained or come close to attaining its share. Table 4-37 shows the actual mortality (with discard mortality rates applied), projected mortality, and the non-nearshore share for yelloweye rockfish in the non-nearshore fishery from 2011-2014 (Source: WCGOP GEMM Product). During those years, the fishery has caught less than the 2015/2016 shares (0.5 mt), which are the lowest in recent history due to a transfer of 0.6 mt from the non-nearshore to the nearshore fishery share for the 2015-2016 biennial harvest specifications cycle. Furthermore, the fishery has actually caught less than 70 percent of projected impacts. If trends were to continue, the fishery can be estimated to actually take approximately 0.5 mt of the 0.7 mt share.

Table 4-37. Comparison of actual vs. projected mortality of yelloweye rockfish in the non-nearshore.

Year	Actual	Projected	Percentage of Actual/Projected	Non-Nearshore Share (mt)
2011	0.30	0.9	33%	2.4
2012	0.39	0.7	55%	2.4
2013	0.27	0.5	54%	1.1
2014	0.48	0.7	69%	1.1

RCA changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation (e.g., changing from 125 to 100 fm). Table 4-39 and Table 4-10 contain the projected mortality groundfish for the non-nearshore fishery for 2017 and 2018, respectively.

Table 4-38. No Action – Non-Nearshore fishery: Overfished species shares for the non-nearshore fixed gear fishery under No Action (mt), based on Default Harvest Control Rule.

Stock	Area	Total Projected OFS Mortality 2017/2018 (mt)	Shares 2017/2018 (mt)	Non-Trawl Allocation 2017/2018 (mt)
BOCACCI	S. 40°10' N. lat.	0.0	182.1/170.7	596.0/558.8
COWCOD	S. 40°10' N. lat.	0.0		2.6/2.6
DARKBLOTCHED	Coastwide	7.0/7.3		18.9/19.6
POP	N. 40°10' N. lat.	0.5/0.5		7.3/7.6
YELLOWEYE	Coastwide	0.8/0.8	0.7/0.7	12.9/12.9

Table 4-39. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. latitude (in mt) for 2017 compared to the non-trawl allocation.

Stock	Management Area	Limited Entry	Open Access	Total	Non-Trawl Allocation
Arrowtooth flounder	Coastwide	60.3	10.9	71.2	585.3
Big Skate		7.8	1.4	9.3	
Black rockfish	South of 46°16` N. lat.	0.0	0.0	0.0	
Cabazon	California	0.0	0.0	0.0	
Cabazon	Oregon	0.0	0.0	0.0	
California scorpionfish	South of 34°27` N. lat.	0.0	0.0	0.0	
Canary rockfish b/	Coastwide	0.26	0.07	0.33	780.6
Chilipepper	South of 40°10` N. lat.	0.0	0.0	0.1	647.8
Dover sole	Coastwide	8.3	1.5	9.8	2,420.3
Ecosystem Component Species		82.7	20.8	103.5	
English sole	Coastwide	0.0	0.0	0.0	487.6
Lingcod	North of 40°10` N. lat.	18.6	2.9	21.5	1,680.4
Lingcod	South of 40°10` N. lat.	1.5	2.1	3.6	683.7
Longnose skate	Coastwide	81.5	16.4	98.0	192.7
Longspine Thornyhead	North of 34°27` N. lat.	2.9	0.7	3.6	142.4
Minor nearshore rockfish	North of 40°10` N. lat.	0.1	0.0	0.2	
Minor nearshore rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Minor shelf rockfish	North of 40°10` N. lat.	5.6	1.0	6.7	783.3
Minor shelf rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	1,409.9
Minor slope rockfish	North of 40°10` N. lat.	73.0	13.1	86.1	321.3
Minor slope rockfish	South of 40°10` N. lat.	17.9	7.5	25.4	254.5
Mixed thornyheads		1.4	0.4	1.8	
Other flatfish	Coastwide	0.5	0.1	0.6	830.6
Other groundfish		0.0	0.0	0.0	
Pacific cod	Coastwide	2.3	0.4	2.7	54.5
Pacific hake	Coastwide	0.6	0.1	0.7	0
Rockfish Unid	North of 40°10` N. lat.	1.3	0.2	1.5	
Rockfish Unid.	South of 40°10` N. lat.	1.3	0.4	1.8	
Rougheye Rockfish	North of 40°10` N. lat.	35.6	6.4	42.0	
Rougheye Rockfish	South of 40°10` N. lat.	1.2	0.4	1.6	
Shortbelly rockfish		0.0	0.0	0.0	0
Shortraker Rockfish	North of 40°10` N. lat.	7.5	1.4	8.9	
Shortraker Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortraker/Rougheye Rockfish	North of 40°10` N. lat.	10.5	1.9	12.4	
Shortraker/Rougheye Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortspine Thornyhead	North of 34°27` N. lat.	23.4	5.5	28.9	82.7
Spiny dogfish	Coastwide	204.9	38.2	243.1	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	87.5
Starry flounder	Coastwide	0.0	0.0	0.0	635.9
Widow rockfish	Coastwide	0.0	0.0	0.0	161.2
Yellowtail rockfish	North of 40°10` N. lat.	0.6	0.1	0.8	621.1

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish under No Action is 59.4 mt in 2017.

c/ Includes blackgill rockfish.

Table 4-40. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries north of 36° N. latitude (in mt) for 2018 compared to the non-trawl allocation.

Stock	Management Area	Limited Entry	Open Access	Total	Non-Trawl Allocation
Arrowtooth flounder	Coastwide	62.9	11.3	74.3	582.2
Big Skate		8.2	1.5	9.7	
Black rockfish	South of 46°16` N. lat.	0.0	0.0	0.0	
Cabazon	California	0.0	0.0	0.0	
Cabazon	Oregon	0.0	0.0	0.0	
California scorpionfish	South of 34°27` N. lat.	0.0	0.0	0.0	
Canary rockfish b/	Coastwide	0.26	0.07	0.33	721.7
Chilipepper	South of 40°10` N. lat.	0.0	0.0	0.1	622.8
Dover sole	Coastwide	8.6	1.6	10.2	2,420.3
Ecosystem Component Species		86.3	21.7	108.0	
English sole	Coastwide	0.0	0.0	0.0	366.2
Lingcod	North of 40°10` N. lat.	19.4	3.1	22.5	1,557.8
Lingcod	South of 40°10` N. lat.	1.5	2.2	3.7	624.8
Longnose skate	Coastwide	85.0	17.1	102.2	192.7
Longspine Thornyhead	North of 34°27` N. lat.	3.0	0.7	3.7	135
Minor nearshore rockfish	North of 40°10` N. lat.	0.1	0.0	0.2	
Minor nearshore rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Minor shelf rockfish	North of 40°10` N. lat.	5.9	1.1	7.0	782.5
Minor shelf rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	1,410.8
Minor slope rockfish	North of 40°10` N. lat.	76.2	13.6	89.8	321.1
Minor slope rockfish c/	South of 40°10` N. lat.	18.7	7.8	26.5	51.0
Mixed thornyheads		1.4	0.4	1.8	
Other flatfish	Coastwide	0.5	0.1	0.6	707.7
Other groundfish		0.0	0.0	0.0	
Pacific cod	Coastwide	2.4	0.4	2.8	54.5
Pacific hake	Coastwide	0.6	0.1	0.7	0
Rockfish Unid	North of 40°10` N. lat.	1.3	0.2	1.5	
Rockfish Unid.	South of 40°10` N. lat.	1.4	0.4	1.8	
Rougeye Rockfish	North of 40°10` N. lat.	37.1	6.7	43.8	
Rougeye Rockfish	South of 40°10` N. lat.	1.2	0.4	1.7	
Shortbelly rockfish		0.0	0.0	0.0	0
Shortraker Rockfish	North of 40°10` N. lat.	7.9	1.4	9.3	
Shortraker Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortraker/Rougeye Rockfish	North of 40°10` N. lat.	10.9	2.0	12.9	
Shortraker/Rougeye Rockfish	South of 40°10` N. lat.	0.0	0.0	0.0	
Shortspine Thornyhead	North of 34°27` N. lat.	24.4	5.7	30.1	81.9
Spiny dogfish	Coastwide	213.7	39.9	253.6	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.0	0.1	87.6
Starry flounder	Coastwide	0.0	0.0	0.0	635.9
Widow rockfish	Coastwide	0.0	0.0	0.0	161.2
Yellowtail rockfish	North of 40°10` N. lat.	0.7	0.1	0.8	597.8

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ The non-nearshore share for canary rockfish under No Action is 55 mt for 2018.

c/ Includes blackgill rockfish in projected impacts, but non-trawl allocation reflects complex without blackgill rockfish.

Impact (Groundfish Mortality) – Non-Nearshore South of 36° N. latitude

Management measures and projected groundfish mortality for the non-nearshore fishery south of 36° N. latitude under No Action is largely influenced by the sablefish ACL, which would be calculated with a P* of 0.40 with a 40:10 adjustment (Section 2.1.1 and Table 2-1). Anticipated catch of sablefish south of 36° N. latitude under No Action would be approximately equal to the 2017-2018 sablefish allocations and resulting landed catch shares for limited entry and open access fixed gears (Table 4-25). Trip limits (Table 4-26 and Table 4-27) would be routinely adjusted to achieve the limited entry and open access sablefish allocations (Table 4-25). Trip limits for other species (e.g., Slope Rockfish, Shelf Rockfish, etc.) may also be adjusted to attain the ACL or achieve other conservation goals.

Under No Action, trawl and non-trawl allocations would be established for overfished species. Further, the non-nearshore fishery would be allocated a share of the non-trawl allocation for bocaccio and yelloweye rockfish (Table 4-38). Routine adjustments of the non-trawl RCA (Table 4-21 and Table 4-22) would occur in the event the projected overfished species mortality is expected to exceed the non-nearshore share or non-trawl allocation (Table 4-38). Changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the non-nearshore share or non-trawl allocation (e.g., changing from 125 to 100 fm).

Projected species mortality for the area south of 36° N. latitude was estimated by using the three-year (2012-2014) average of estimated mortality from the WCGOP groundfish mortality reports (Table 4-41). Due to the lack of a model to predict the mortality in this area, it is assumed that 2017 and 2018 mortalities are the same.

Table 4-41. No Action. Projected groundfish mortality for the limited entry and open access fixed gear fisheries south of 36° N. latitude (in mt) for 2017/2018 compared to the non-trawl allocation.

Stock	Management Area	Limited Entry (mt)	Open Access (mt)	Total (mt)	Non-Trawl Allocation a/ (mt)
Arrowtooth flounder	Coastwide		1.9	1.9	585.3
Big Skate		3.0	0.2	3.3	
Chilipepper	South of 40°10` N. lat.	0.1	0.2	0.3	647.8
Dover sole	Coastwide	1.7	0.1	1.9	
Ecosystem Component Species		92.3	2.9	95.2	
Lingcod	South of 40°10` N. lat.	0.2	4.9	5.1	683.7
Longnose skate	Coastwide	4.5	2.5	7.0	185.3
Longspine Thornyhead	North of 34°27` N. lat.	5.3	0.0	5.3	142.4
Longspine Thornyhead	South of 34°27` N. lat.	15.9	0.8	16.6	
Minor nearshore rockfish	South of 40°10` N. lat.		0.1	0.1	
Minor shelf rockfish	South of 40°10` N. lat.	3.3	10.7	14.1	1409.9
Minor slope rockfish b/	South of 40°10` N. lat.	16.5	21.3	37.8	254.5
Mixed thornyheads		0.2	0.0	0.2	
Other flatfish	Coastwide	1.8	1.6	3.4	830.6
Other groundfish		1.1	0.3	1.4	
Pacific cod	Coastwide	0.1	0.1	0.1	54.5
Pacific hake	Coastwide	1.0	0.0	1.0	0
Rockfish Unid.	South of 40°10` N. lat.	0.4	1.0	1.4	
Shortspine Thornyhead	North of 34°27` N. lat.	24.0	1.0	25.1	82.7
Shortspine Thornyhead	South of 34°27` N. lat.	104.5	4.1	108.6	813.7
Spiny dogfish	Coastwide	0.6	3.4	4.0	
Splitnose rockfish	South of 40°10` N. lat.	0.1	0.2	0.2	87.5
Widow rockfish	Coastwide	0.1	0.2	0.3	161.2

a/ The non-trawl allocation includes the non-nearshore, nearshore, and recreational fisheries.

b/ Includes blackgill rockfish; in 2018, blackgill rockfish will be pulled from the complex. The 2018 non-trawl allocation for minor slope rockfish is 51.0 mt.

Impact (Groundfish Mortality) - Nearshore – No Action

The nearshore model projects mortality of overfished species based on the expected landings of nearshore species by the limited entry and opens access sectors shoreward of the non-trawl RCA coastwide. The majority of vessels participating in nearshore commercial fisheries do not hold Federal limited entry permits. The most common gear used is jig gear; however, some vessels use longline gear to target nearshore species and, in fewer instances, pots or traps are used in the nearshore fishery.

California and Oregon limit entry to the nearshore groundfish fishery by requiring a state limited entry permit to take nearshore groundfish species (Washington does not allow a nearshore commercial fishery). Therefore, while these fisheries are considered open access federally, participation is limited by the states. In Oregon, more conservative state quotas than those specified in Federal regulations exist for most nearshore species, and state trip limits apply in these cases. State trip limits are designed to stay within nearshore species quotas while providing a year-round opportunity, if possible. Detailed descriptions of the state nearshore fisheries can be found in the 2015-2016 EIS (PFMC and NMFS 2015). Federal

management measures for west coast nearshore commercial groundfish fisheries are typically stratified north and south of 40° 10' N. latitude, with some measures stratified north and south of 42° N. latitude and others stratified south of 34° 27' N. latitude.

There are state quotas (Section 4.1.1.3) as well as Federal limits (Table 4-6, Table 4-7, and Table 4-42) that restrict landings in the commercial nearshore fishery. In the event the projected overfished species mortality is expected to exceed the nearshore share or non-trawl allocation, routine adjustments of the shoreward non-trawl RCA (Table 4-21 and Table 4-22) or reduced trip limits for nearshore species could occur. RCA changes can also be accommodated to provide greater access to target species when overfished species mortality is projected to be within the nearshore share or non-trawl allocation (e.g., changing from 20 to 30 fm).

The No Action Alternative is based on the expectation that landings in the nearshore fishery will be similar to recent historical average landings from 2010-2014 (Table 4-43 and Table 4-44), which are lower than most of the state quotas with the following exceptions: (1) California north of 40°10' N. latitude black rockfish landings reflect the estimated 2015 landings (Table 4-49, 108 mt); (2) Oregon will attain their full nearshore rockfish allocations by liberalizing the conservative state trip limits that were adopted in 2015; (3) Oregon landings of kelp greenling will increase to better utilize the allocation; and (4) lingcod landings in Oregon will continue to linearly increase from year to year.

Nearshore fishery landings are influenced by a variety of factors, including weather and market conditions, and can vary annually (Table 4-44). As such, there is substantial uncertainty surrounding the estimated landings under No Action and the action alternatives, which in turn may influence the projected overfished species mortality and socioeconomic analysis. In the event fishery performance is better than the five-year average, mortality of groundfish species will be higher; however, the fishery will still be managed to ensure combined commercial and recreational catches stay within the non-trawl allocation.

The following trip limit adjustments are proposed for the nearshore fishery under No Action: reductions for black rockfish in California north of 40°10' N. latitude (Table 4-50), increases for canary rockfish coastwide (see discussion below), and increases for California scorpionfish south of 34°27' N. latitude (Table 4-52). The remaining management measures would be the same as in the 2016 Federal regulations (Table 4-21 and Table 4-22). The nearshore fishery is projected to attain their yelloweye rockfish share of the non-trawl allocation (Table 4-45). Accordingly, deviations in any of the factors that affect bycatch (e.g., catch, effort, bycatch rates) could result in the fishery exceeding their share. In the event the projected overfished species mortality is expected to exceed the nearshore share or non-trawl allocation, routine adjustments of the shoreward non-trawl RCA or reduced trip limits for nearshore species could occur.

Table 4-42. No Action. Non-Trawl Allocations, Nearshore Shares, and State Shares under No Action.

2017				State Shares	
Stock	Area	Non-Trawl Allocation	Nearshore Share	OR	CA
BOCACCIO	South of 40°10' N. Lat.	596	2.3	N/A	
YELLOWEYE	Coastwide	12.9	2	1.4	0.6
Canary rockfish	Coastwide	780.6	104.8	28	76.8

2018				State Shares	
Stock	Area	Non-Trawl Allocation	Nearshore Share	OR	CA
BOCACCIO	South of 40°10' N. Lat.	558.8	2.2	N/A	
YELLOWEYE	Coastwide	12.9	2	1.4	0.6
Canary rockfish	Coastwide	721.7	96.9	25.9	71

Table 4-43. No Action. Expected landings under the No Action Alternative, which are the average landings for the commercial nearshore fishery from 2010-2014 unless noted. Target species landings by area are also shown in the far right panel. The 2017 quotas (or HGs) for Oregon are provided in parenthesis. Quotas for Oregon are the state partition of Federal allocations to the Oregon “commercial nearshore fishery,” with the remainder to the Oregon sport fisheries.

Stock	Area	Total (mt) 2017-2018	By Area for 2017-2018			
			OR Total (mt)	CA Total (mt)	40°10'-42° N lat. (mt)	S. of 40°10' N. lat. (mt)
Black rockfish	OR	126	126 (126)a/			
Black rockfish	CA	100		100	95	5
Cabezon	OR	23.6	23.6 (30)			
Cabezon	CA	65.5	N/A	65.5	2.5	63
Canary Rockfish b/	OR&CA	12.5	1.9	10.6	2	8.6
Kelp greenling	OR	30	30 c/			
Kelp greenling	CA	3.8	N/A	3.8	0.4	3.4
Lingcod	N. 40°10' N. lat.	68.6	65 d/	3.6	3.6	
Lingcod	S. 40°10' N. lat.	21.2	N/A	21.2		21.2
Nearshore Rockfish N. e/	N. 40°10' N. lat.	22.7	17.5 (17.5)a/	5.2	5.2	
--Blue rockfish		10.6	7	3.6	3.6	
--Other Nearshore Rockfish		12.1	10.5	1.6	1.6	
Nearshore Rockfish S.	S. 40°10' N. lat.	80.7	N/A		N/A	
--Blue rockfish		2.7	N/A	2.7		2.7
--Shallow Nearshore Rockfish f/		49	N/A	49	N/A	49
--Deeper Nearshore Rockfish g/		29	N/A	29	N/A	29

a/ The nearshore commercial fishery Oregon is projected to catch their entire allocations of black rockfish and nearshore rockfish, which are not federal allocations rather presumptive state allocation (to the Oregon nearshore fishery) from within the federal Oregon allocations ACL (for black rockfish) or HG for nearshore rockfish

b/ Canary rockfish landings are projections based on trip limits of 100 lbs for OA and 300 lbs for LE. These are not preferred trip limits by the states, rather a middle-ground starting point for analysis.

c/ Oregon landings of kelp greenling are expected to rise beyond average since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

d/ Lingcod landings in Oregon have shown a constant yearly increase and are expected to increase in the future at the same rate.

e/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, treefish, calico, and quillback rockfish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

f/ Shallow Nearshore Rockfish consists of black-and-yellow rockfish, China rockfish, gopher rockfish, grass rockfish, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

g/ Deeper Nearshore Rockfish consists of black rockfish, blue rockfish, brown rockfish, calico rockfish, copper rockfish, olive rockfish, quillback rockfish, and treefish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

Table 4-44. Annual landings and averages for nearshore species from 2010-2014.

Stock	Area	2010	2011	2012	2013	2014	Avg.
Black rockfish	OR	100.1	96.7	95.7	106.0	121.6	104.0
Black rockfish	CA	51.5	26.4	24.0	35.3	40.2	35.5
Calif scorpionfish	CA	2.8	3.1	3.0	1.7	0.9	2.3
Cabezon	OR	23.5	29.4	28.8	19.8	15.4	23.4
Cabezon	CA	21.5	30.6	28.4	27.8	29.3	27.5
Kelp greenling a/	OR	18.3	20.8	19.0	21.8	15.4	19.0
Kelp greenling	CA	1.6	2.0	5.0	5.5	4.6	3.7
Lingcod	N. 40°10' N. lat.	24.1	33.6	38.5	48.7	46.2	38.2
--OR b/		20.2	30.1	35.2	45.5	42.1	34.6
--CA		3.9	3.5	3.3	3.2	4.1	3.6
Lingcod	S. 40°10' N. lat.	13.8	17.0	18.2	24.8	31.6	21.1
Nearshore Rockfish N. c/	N. 40°10' N. lat.	15.7	24.9	24.4	18.7	12.8	19.3
--Blue rockfish (OR)		4.0	6.6	6.8	5.0	3.9	5.3
--Blue rockfish (CA)		3.4	5.1	2.8	2.1	1.4	3.0
--Other Nearshore Rockfish (OR)		6.5	11.3	12.0	10.5	6.9	9.4
--Other Nearshore Rockfish (CA)		1.8	1.9	2.8	1.1	0.6	1.6
Nearshore Rockfish S. c/	S. 40°10' N. lat.	84.8	91.0	79.7	87.3	89.0	86.4
--Blue rockfish		1.4	2.0	1.3	3.5	5.1	2.7
--Shallow Nearshore Rockfish d/		52.8	55.8	46.5	47.6	49.2	50.4
--Deeper Nearshore Rockfish e/		30.7	33.3	32.0	36.2	34.7	33.4

a/ Oregon landings of kelp greenling are expected to rise beyond average (19 mt, Table 4-44) since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

b/ Lingcod landings in Oregon have shown a constant yearly increase (Table 4-44a/ The nearshore commercial fishery Oregon is projected to catch their entire allocations of black rockfish and nearshore rockfish, which are not federal allocations rather presumptive state allocation (to the Oregon nearshore fishery) from within the federal Oregon allocations ACL (for black rockfish) or HG for nearshore rockfish

b/ Canary rockfish landings are projections based on trip limits of 100 lbs for OA and 300 lbs for LE. These are not preferred trip limits by the states, rather a middle-ground starting point for analysis.

c/ Oregon landings of kelp greenling are expected to rise beyond average since the 2015 assessment found that stock to be more robust than previously thought, and that historical harvests have been below target. In response, Oregon is expected to increase state trip limits of kelp greenling to better utilize the stock.

d/ Lingcod landings in Oregon have shown a constant yearly increase and are expected to increase in the future at the same rate.

e/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, treefish, calico, and quillback rockfish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

f/ Shallow Nearshore Rockfish consists of black-and-yellow rockfish, China rockfish, gopher rockfish, grass rockfish, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

g/ Deeper Nearshore Rockfish consists of black rockfish, blue rockfish, brown rockfish, calico rockfish, copper rockfish, olive rockfish, quillback rockfish, and treefish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

) and are expected to increase in the future at the same rate.

c/ Nearshore Rockfish totals consists of black-and-yellow, blue, China, gopher, grass, kelp, brown, olive, copper, calico, and quillback rockfish and treefish. These species are part of the Nearshore Rockfish complex north and south of 40°10' N. latitude.

d/ Shallow Nearshore Rockfish consist of black-and-yellow, China, gopher, grass, and kelp rockfish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

e/ Deeper nearshore consists of black, blue, brown, calico, copper, olive, and quillback rockfish, and treefish south of 40°10' N. latitude. These species are part of the Nearshore Rockfish complex south of 40°10' N. latitude.

Table 4-45. No Action - Nearshore. Projected overfished species (OFS) mortality (mt) compared to the overfished species shares for 2017-2018 (mt).

Stock	Area	Total Projected OFS Mortality 2017-2018	Projected OFS Mortality and shares by Area for 2017-2018			
			Oregon Total (Share)	CA Total (Share)	40°10' – 42° N. lat.	S. of 40°10' N. lat.
BOCACCIO	S. 40°10' N. lat.	0.5	N/A	0.5	N/A	0.5
COWCOD	S. 40°10' N. lat.	0	N/A	0	N/A	0
DARKBLOTCHED	Coastwide	0.2	0.1	0.1	0	0.1
POP	N. 40°10' N. lat.	0	0	0	0	0
PETRALE	Coastwide	0	0	0	0	0
YELLOWEYE	Coastwide	2.0	1.4 (1.4)	0.6 (0.6)	0.5	0.1

Additional Management Measures Analyzed

Range of Nearshore Rockfish HGs

The Council requested analysis of a range of state-specific Minor Nearshore Rockfish HGs north of 40°10' N. latitude (Table 4-8). The state-specific HGs for Oregon and California are further allocated within the state processes between the commercial and recreational fisheries (Section 4.1.1.3). Projections in Table 4-43 assume status quo sharing (i.e., same proportions as in 2015-2016) of the Nearshore Rockfish HG north of 40° 10' N. latitude to each of the states.

Option 1

Under Option 1, the states equally share the ACL contributions for the stocks without state assessment boundaries. For stocks that have state-specific stock assessment boundaries, the states receive 100 percent of the ACL contribution (e.g., WA receives 100 percent of the ACL contribution of the WA China rockfish assessment). For the nearshore commercial fishery, the projected mortality for all species, except Minor Nearshore Rockfish north of 40°10' N. latitude, remains the same as displayed in Table 4-43 and Table 4-45 under Option 1. In Oregon, the allocation and associated landings of Minor Nearshore Rockfish north of 40°10' N. latitude would be 10.3 mt, which is 58 percent of landings under the status quo sharing option (17.5 mt). The California HG is higher under Option 1, compared to No Action; however increased trip limits for the commercial fishery are not proposed because no additional mortality of yelloweye can be accommodated (Table 4-45).

Option 2

Under Option 2, status quo proportions were used to allocate stocks without state-specific assessment boundaries (not equal shares as with Option 1). For stocks that have state-specific stock assessment boundaries, the states receive 100 percent of the ACL contribution (e.g., WA receives 100 percent of the ACL contribution of the WA China rockfish assessment). For the nearshore commercial fishery, the projected mortality for all species, except Minor Nearshore Rockfish north of 40°10' N. latitude, remains the same as displayed in Table 4-43 and Table 4-45 under Option 2. In Oregon, the allocation and associated

landings of Minor Nearshore Rockfish north of 40°10' N. latitude would be 13.0 mt, which is 74 percent of landings under the status quo sharing option (17.5 mt). The California HG is higher under Option 1, compared to No Action; however increased trip limits for the commercial fishery are not proposed because no additional mortality of yelloweye rockfish can be accommodated (Table 4-45).

Table 4-46. Allocations of nearshore rockfish north of 40° 10' N. to Oregon and California nearshore fisheries for the three allocation alternatives, projected landings for blue rockfish species and the other nearshore rockfish, and total mortality of yelloweye rockfish. All other impacts are the same as in Table 4-43. Allocations for Oregon are not Federal allocations, rather the presumptive state allocations of the Oregon Federal HG to the “Oregon commercial nearshore fishery.”

	Status Quo a/	Option 1 b/	Option 2 c/
Oregon HG Commercial and Recreational	60.5	36.2	46.1
<i>Estimated Total Nearshore Rockfish Landings OR d/</i>	17.5	10.3	13
--Blue rockfish (OR)	7	4.1	5.2
--Other Nearshore Rockfish (OR)	10.5	6.2	7.8
California HG Commercial and Recreational	29.6	41.4	40.2
<i>Estimated Total Nearshore Rockfish Landings CA e/</i>	5.2	5.2	5.2
--Blue rockfish (CA)	3.6	3.6	3.6
--Other Nearshore Rockfish (CA)	1.6	1.6	1.6

a/ Same proportions (status quo) of the total fishery HG applied to each of the states.

b/ For stocks with state-specific assessment boundaries, states receive their entire respective component ACL. For stocks without, the states equally share (33.3 percent to each).

c/ For stocks with state-specific assessment boundaries, states receive their entire respective component ACL. For stocks without, the same proportions (status quo) are used.

d/ Estimated landings for Oregon do not represent Federal allocations, rather the presumptive state allocations of the Oregon Federal HG to the Oregon commercial nearshore fishery.

e/ Estimated landings for California do not represent Federal allocations, rather the presumptive landings under a given HG.

Canary Rockfish Trip Limits

Canary rockfish was declared rebuilt in 2016 and therefore trip limits, in lieu of a prohibition on retention as in 2016, are proposed for the 2017-2018 management cycle and beyond. These trip limit would apply north and south of 40° 10' N. latitude for both the limited entry and open access sectors. The same set of limits would also apply to both the non-nearshore and nearshore fisheries; however, given that the highest density of canary rockfish occurs from 50 to 100 fm (PFMC 2014), the majority of the catch is expected in the nearshore fishery. For California, the trip limit structure would apply to north and south of the 40° 10' N. latitude management line for both the limited entry and open access non-trawl fixed-gear sectors in each management area, with the fishery open to the limited entry sector year-round between 42° N. latitude and 34° 27' N. latitude and closed March/April south of 34° 27' N. latitude, and open year-round to the open access sector north of 40° 10' N. latitude and closed March/April south of 40° 10' N. latitude. The limited entry and open access closure south of 34° 27' N. latitude is being proposed because it would match the existing trip limit structure now in place for the Shelf Rockfish complex. By establishing a canary rockfish bi-monthly trip limit structure that matches the Shelf Rockfish complex, it would provide for a uniform approach for monitoring, management, and law enforcement. It would also be least likely to alter the current fishing behavior of the fleet.

The starting point for the trip limit analysis was to establish limits at a level to accommodate incidental bycatch while not establishing a target fishery. In April 2016, the Council is scheduled to adopt the preliminary preferred trip limit structure, and as such the objective (e.g., providing for targeting) and associated values may change. For limited entry, a 300 lb/two month limit was used because it would allow the relatively few vessels that participate in the nearshore fishery to retain most or all their canary bycatch. Further, the limit would allow the limited entry non-nearshore vessels to retain most or all their canary bycatch, which is near zero (i.e., typically less than 1 mt for the primary and DTL fisheries combined, and with 99.2 percent of observed limited entry non-nearshore trips catching zero canary rockfish). A range of limits from 0 to 300 lb/two month period for the open access sector were analyzed (see Appendix A) since canary rockfish encounters are relatively prevalent by these vessels (i.e., total nearshore impacts are typically 5-15 mt per year, and ~20 percent of trips encounter canary).

A two-stage bootstrap projection model was used to project landings and discard mortality of canary rockfish in the nearshore fishery under the range of open access trip limits (left panels in Table 4-47). Outcomes include a non-targeting scenario and a 14 percent targeting scenario, which is hypothesized to be the potential targeting rate based on the level of targeting that was presumed to have occurred in the historical fishery when targeting was permitted (Appendix A). Only the 14 percent targeting scenario is presented in Table 4-47 because it is expected that some targeting will occur, even under the lower trip limit scenarios. The estimated mortality in the open access fishery was then combined with the expected mortality from the limited entry sector, under a 300 lb/two month limit, to estimate total mortality of canary for the entire fixed gear sector (right panel in Table 4-47). The range of fixed gear mortality of canary rockfish (6.1 to 18.9 mt, Table 4-47) under the trip limits is well within the nearshore share (104.8 and 96.8 mt, Table 4-42).

Based on the bootstrap analysis, open access trip limits of 100 and 150 lb/two months are expected to be the most effective for maximizing retention of bycatch (Table 4-47, 89 percent and 95 percent retention, respectively) while limiting potential impacts from targeting. Trip limits below 100 lb per month would result in greater discarding of bycatch, but would also result in the lowest total mortality.

To streamline the economic analysis (Section 4.2), a single projection of canary rockfish landings was requested, and, as such, a single trip limit had to be selected from the nine presented in Table 4-47. The 100 lb/two month limit for open access was selected because it closely meets the goal of allowing fishermen to retain a majority of their canary rockfish bycatch (i.e., 89.3 percent).

Table 4-47. Projected impacts to canary rockfish in the nearshore fishery for open access trip limits ranging from 0-300 lbs per period and with LE fixed at 300 lbs for all (except non-retention). Open access trip limits assume 14 percent targeting, based on historical practices.

Open Access Estimates						Nearshore Total Mortality (mt) a/	Regional Landings (lbs.) b/		
OA Trip Limit	Landings (lbs.)	Discarded (lbs.)	Total (lbs.)	% Landed	% Discarded		N 42°	40°10'-42°	S 40°10'
0	0	25550	25550	0.0%	100.0%	6.1	0	0	0
10	6,205	19,894	26,099	23.8%	76.2%	7.6	953	995	4,257
25	12,637	14,288	26,925	46.9%	53.1%	9.2	1,941	2,027	8,669
50	19,928	8,372	28,300	70.4%	29.6%	11.1	3,062	3,196	13,671
100	27,714	3,336	31,050	89.3%	10.7%	13.4	4,258	4,444	19,012
150	32,055	1,745	33,800	94.8%	5.2%	15.0	4,925	5,140	21,990
200	35,322	1,227	36,549	96.6%	3.4%	16.3	5,427	5,664	24,231
250	38,310	989	39,299	97.5%	2.5%	17.6	5,886	6,144	26,281
300	41,105	945	42,050	97.8%	2.2%	18.9	6,315	6,592	28,198

a/ Totals are for LE and OA vessels combined for the nearshore fishery and assume a 300 lb/two month limit for limited entry. The canary rockfish mortality in the non-nearshore fishery is expected to be approximately 1 mt.

b/ Regional values were partitioned from the total based on average (2010-2014) total mortality (15.4% to N 42°; 16.0% to 40°10'-42°; 68.6% to S 40°10')

Black Rockfish Trip Limits

Black rockfish is managed as a single stock south of 42° N. latitude. Trip limit options analyzed herein are for California's management area north of 40° 10' N. latitude for the LE and OA non-trawl fixed-gear sectors. The 2017 black rockfish ACL is 334 mt and is 332 mt for 2018. Prior to 2017 (2015 and 2016) black rockfish was managed under an ACL harvest control rule constant catch strategy shared with Oregon at 1,000 mt. In California, black rockfish is shared by the commercial and recreational sectors. The 2015-2016 commercial trip limits (in pounds) for black rockfish north of 40° 10' N. latitude are described in Table 4-48, which would remain in effect absent the routine adjustments proposed here.

Participation in the northern nearshore fishery, of which black rockfish is a component, is relatively small with approximately 20 individuals who hold a deeper nearshore fish species permit allowing them to catch and land black rockfish. Landings in 2015 (preliminary) were substantially greater than in previous years and even exceeded those in the late 2000s (Table 4-49).

Table 4-48. 2016 bi-monthly cumulative trip limits (in lbs) for limited entry and open access fixed-gear black rockfish north of 40° 10' N. latitude.

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
8,500	8,500	8,500	6,000	6,000	6,000

Note: Federal trip limit regulations stipulate that of the above amounts, no more than 1,200 lb of which may be species other than black rockfish.

Table 4-49. Commercial black rockfish landings (mt) in California north of 40° 10' N. latitude from 2005 to 2015 by the limited entry and open access fixed-gear sector. Note that the 2015 landings total is a preliminary projection.

Year	Landings (mt)
2005	69.7
2006	58.0
2007	79.4
2008	80.9
2009	86.7
2010	48.2
2011	22.2
2012	16.9
2013	27.1
2014	34.0
2015	108.5

(Data source: PacFIN)

Table 4-50 summarizes bi-monthly trip limits for the LE and OA sectors north of 40° 10' N. latitude, proposed for the 2017-2018 management cycle, and corresponding projected impacts. Bi-monthly trip limits range from 6,000 to 8,500 lb per two months. For analytical and managerial ease, bi-monthly limits are assumed the same in each period for the two action alternatives. Commercial landings north of 40° 10' N. latitude during this time period were adjusted by including discard mortalities to the analytical options to project mortality for this area.

Table 4-50. Summary of black rockfish bi-monthly trip limits (in pounds) for the limited entry and open access fixed-gear sectors north of 40°10' N. latitude and corresponding projected mortality impacts (mt).

	Trip Limits (pounds)						Projected mortality (mt)
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	
No Action	8,500 lb/2 mo			6,000 lb/2 mo			108.5
Option 1	7,000 lb/2 mo						94.1
Option 2	6,000 lb/2 mo						80.6

Participation in the black rockfish fishery has been unpredictable in recent years in northern California. After the 2011 tsunami event, fishery infrastructure in some northern California ports was damaged and landings were severely curtailed. However, since then, the fishery is rebounding with steadily increasing landings. Preliminary data suggest that the 2015 fishing season may be an anomaly - excellent fishing conditions, coupled with a poor Dungeness crab season in the first part of the year contributed to higher than expected landings. Although the non-trawl RCA shoreward boundary was adjusted in 2015 from 20 fathoms to 30 fathoms, fishing continued to take place in waters shallower than 20 fathoms to better accommodate the live fish market.

Since the total amount of black rockfish that is available to the fishery in 2017 and 2018 was decreased by approximately 80 mt from the previous two-year cycle, the Council is considering the possibility of decreased trip limits for black rockfish to keep the mortality within acceptable limits.

California Scorpionfish Trip Limits

California scorpionfish is managed as a single stock, with trip limit options analyzed for both the LE and OA non-trawl fixed-gear sectors combined. Proposed trip limit increases are examined in an effort to provide the commercial sector a modest increase in its harvest opportunity. The bi-monthly trip limits for LE and OA sectors in 2016, which would be in effect absent any routine adjustment proposed by the Council, are described in Table 4-51. For 2015-2016, California scorpionfish south of 34° 27' N. latitude was not managed to sector-specific allocations, and this will carry through to 2017 and 2018. California scorpionfish are not formally allocated between the trawl or non-trawl sectors, nor are they formally allocated within the non-trawl sector (i.e., the non-trawl sector is shared among LE, OA, and recreational). The 2017 and 2018 ACLs, south of 34° 27' N. latitude are expected to increase to 150 mt per year, with a Council-adopted ACT of 111 mt.

Table 4-51. Summary of limited entry and open access bi-monthly trip limits (in pounds) for California scorpionfish in 2016.

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
1,200	Closed	1,200	1,200	1,200	1,200

Despite an increased ACL for 2017 and 2018, participation in the commercial California scorpionfish fishery south of 34° 27' N. latitude is limited and is expected to continue as such, with the 2011-2014 annual average of 27 vessels operating in all commercial sectors combined. Within the commercial sectors, hook-and-line and trap vessels averaged 0.13 mt per year with trawlers averaging 0.16 mt annually. Data indicate that no participants attained greater than 35 percent of their annual limit, with all but two vessels taking less than five percent of the allowable annual limit. Historically, the recreational sector has accounted for the majority of the take of California scorpionfish.

A range of higher trip limits was explored for LE and OA sectors (Table 4-52). Cumulative bi-monthly trip limits are the amounts (pounds) that each vessel may land during a given two-month period when fishing is allowed. Projected landings mortality are based on average landings during 2012-2013 and factor in a proxy discard mortality from the 2014 WCGOP estimate. The recreational projected mortality uses the 2015 estimate from RecFIN.

Table 4-52. Summary of limited entry and open access bi-monthly trip limits (in lbs) and projected impacts (mt) for California scorpionfish south of 34° 27' N. latitude.

Options	Commercial		Recreational projected mortality (mt)	Total	Percent of 2017 ACT
	Trip limit (pounds)	Projected mortality (mt)			
No Action	1,200	4.7	96.7	101.4	91.4%
Opt. 1	1,500	5.5		102.2	92.1%
Opt. 2	1,700	6.1		102.8	92.6%

All of the trip limits analyzed are expected to keep overall mortality within allowable limits. Given the low proportion of total mortality originating from the commercial fishery, and the small number of participants capped by the requirement to hold a nearshore fishery permit, it is believed that increasing the commercial trip limit will not pose a significant risk of exceeding the ACT.

4.1.1.7 Tribal Fisheries – No Action

Tribal fisheries consist of trawl (bottom, midwater, and whiting), fixed gear, and troll. Principle management controls in the tribal fisheries include allocations, set-asides, HGs, and trip limits. Tribal set-asides are outlined in Table 4-1 and Table 4-3. The Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) would conduct their groundfish fisheries in 2017-2018 with the allocations and management measures as described in Table 4-53.

Table 4-53. The No Action : Tribal fishery based on current regulations and those proposed for 2017-2018.

Management Measures	<p>Black Rockfish</p> <p>For the commercial harvest of black rockfish off Washington State, a treaty Indian tribes' harvest guideline is set at 30,000 lb for the area north of Cape Alava, WA (48°09.50' N. lat.) and 10,000 lb for the area between Destruction Island, WA (47°40' N. lat.) and Leadbetter Point, WA (46°38.17' N. lat.). This harvest guideline applies and is available to the Pacific Coast treaty Indian tribes. There are no tribal harvest restrictions for black rockfish in the area between Cape Alava and Destruction Island.</p> <p><u>Sablefish</u> The sablefish allocation to Pacific coast treaty Indian Tribes is 10 percent of the sablefish ACL for the area north of 36° N. lat. and is reduced by 1.5 percent (decreased from 1.6 percent in 2016) for estimated discard mortality.</p> <p><u>Lingcod</u> are subject to an overall catch of 250 mt for all treaty fishing.</p> <p><u>Pacific whiting</u> -The tribal allocation for 2015 is 56,888 mt.</p> <p><u>Pacific cod</u> - Managed to the tribal HG of 500 mt.</p> <p><u>Petrable sole</u> – are subject to a fleetwide harvest target of 220 mt. Trawl vessels are restricted to small footrope trawl gear.</p> <p><u>Yellowtail rockfish</u> – in the directed midwater trawl fisheries are subject to annual catch of 1,000 mt for the entire fleet, per year.</p> <p><u>Spiny dogfish</u> – are subject to an expected total catch of 275 mt per year.</p> <p><u>Rockfish</u> - Full retention. Rockfish taken during open competition tribal commercial fisheries for Pacific halibut would not be subject to trip limits.</p> <p><u>Thornyheads</u></p> <ul style="list-style-type: none"> • Shortspine thornyhead cumulative trip limits are 17,000-lb per 2 months, limited to 50 mt annually. • Longspine thornyhead cumulative trip limits are 22,000-lb per 2 months, limited to 30 mt annually. <p><u>Canary rockfish</u> 300 lb per trip</p> <p><u>YELLOWEYE ROCKFISH</u> 100 lb per trip</p> <p><u>Makah Tribe midwater trawl fisheries:</u></p>
---------------------	--

	<p>Landings of widow rockfish must not exceed 20 percent of the weight of yellowtail rockfish landed (was 10 percent in 2016), for a given vessel, throughout the year for a total catch of 200 mt. These limits may be adjusted by the tribe inseason to minimize the incidental catch of canary rockfish and widow rockfish, provided the catch of yellowtail rockfish does not exceed 1,000 mt for the fleet.</p> <p><u>Minor Nearshore rockfish</u>, 300 lb per trip limit per species or species group, or to the non-tribal limited entry trip limit for those species if those limits are less restrictive than 300 lb per trip.</p> <p><u>Minor Shelf Rockfish and Slope Rockfish</u>. Redstripe rockfish are subject to an 800 lb trip limit. Shelf (excluding redstripe rockfish), and Slope Rockfish groups are subject to a 300 lb trip limit per species or species group, or to the non-tribal limited entry fixed gear trip limit for those species if those limits are less restrictive than 300 lb per trip. Limited entry fixed gear trip limits are specified in the regulations (Table 2 (North) in 660.00 Subpart E)</p> <p><u>Other rockfish</u> 300 lb per trip limit per species or species group, or to the non-tribal limited entry trip limit for those species if those limits are less restrictive than 300 lb per trip.</p> <p><u>Flatfish and Other Fish (small footrope bottom trawl)</u> For Dover sole, English sole, Other Flatfish, and arrowtooth flounder trip limits will be established in tribal regulation only and adjusted in-season to stay within the overall harvest targets and overfished species limits. This is a change from 2016 where the following limits were in place: Dover sole, English sole, Other Flatfish had 110,000 lbs per 2 months and arrowtooth flounder was 150,000 lbs per 2 months.</p> <p><u>Spiny dogfish</u> are managed within the limited entry trip limits for non-tribal fisheries.</p>
EFH	<ul style="list-style-type: none"> • EFH closures in tribal U&A fishing areas do not apply to tribal fisheries
RCA	<ul style="list-style-type: none"> • RCA closures in tribal U&A fishing areas do not apply to tribal fisheries
Monitoring	<ul style="list-style-type: none"> • The Makah Tribe shoreside observer program to monitor and enforce Makah limits
Reporting	<ul style="list-style-type: none"> • VMS declarations for trawl only

Impact (Groundfish Mortality)

For the 2017-18 fishing seasons all tribal fisheries will be managed not to exceed set-asides, and HGs. Trip limits will be subject to in-season adjustments in order to utilize tribal set-asides, and HGs.

All midwater landing limits were subject to inseason adjustments to minimize the take of both canary and widow rockfish. Full rockfish retention programs, where all overfished and marketable rockfish are retained, as well as a Makah trawl observer program, were in place to provide catch accountability.

4.1.1.8 Washington Recreational – No Action

Primary catch controls for the Washington recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. Yelloweye rockfish is the overfished stock primarily caught in the Washington recreational fishery. Seaward adjustments of the recreational RCAs, which focuses fishing effort in the nearshore area where yelloweye rockfish encounters and mortality of discarded fish are lower, are the main management measure for reducing catches of this stock. Under the No Action Alternative, Washington recreational fisheries would operate under the ACLs that are generated by applying the default HCR from the 2015-2016 cycle (Section 2.1.1) including a 20 mt ACL for yelloweye rockfish and 1,714 and 1,588 mt canary rockfish ACLs for 2017 and 2018 respectively, and the associated Washington

recreational HGs of 3.3 mt for yelloweye rockfish and 53.2 and 49.2 for canary rockfish in 2017 and 2018 respectively (Table 4-54).

The west coast states will be responsible for tracking and managing catches of Nearshore Rockfish north of 40°10' N. latitude. If harvest levels in Washington approach 75 percent of the state-specific HG (Table 4-54), the state of Washington will consult with the other west coast states via a conference call and determine whether inseason action is needed. The HG for Washington would be a state HG and not established in Federal regulations (Table 4-54). In the event inseason action is needed, the state of Washington would take action through state regulation. Inseason updates would be provided to the Council at the September and November meetings.

Table 4-54. No Action – Washington Recreational. Harvest guidelines (HG) for the Washington recreational fisheries under the No Action Alternative.

Species	HG (mt)	
	2017	2018
Canary Rockfish	53.2	49.2
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish	13.1	13.1

Groundfish Seasons and Area Restrictions

Season Structure

Under the No Action Alternative, two options for groundfish seasons would be considered. The status quo Washington recreational season would be open year-round for groundfish (Table 4-55), except lingcod (see the Section on Lingcod Seasons and Size Limits). The Option 1 groundfish season would be open from March 15 through October 15 and closed from October 16 through March 14 (Table 4-56). Note that although the groundfish fishery dates would be modified under Option 1, the status quo lingcod season dates would remain in effect for each Marine Area. The Option 1 recreational groundfish season is not expected to result in significant changes to groundfish mortality because very little fishing effort occurs in Marine Areas 1-4 from October through February. The primary purpose of this option is to cap groundfish fishing effort at current levels and minimize additional effort that could potentially develop in the future.

Depth restrictions are the primary tool used to keep recreational mortality of yelloweye rockfish within specified HGs. Because the 2017-2018 yelloweye rockfish HG for Washington recreational fisheries changes very little from what was in place in the previous management period, no changes to depth restrictions are being proposed. Under the No Action Alternative, two rockfish sub-limit options are being considered. Option 2 would allow retention of one canary rockfish due to the need to minimize encounters with yelloweye rockfish, which continues to drive management measures for Washington recreational fisheries. Projected mortality for canary rockfish does increase as a result of allowing retention under Option 2 but falls well below the HG under the No Action Alternative. However, projected mortality estimates do not account for changes to angler behavior resulting from allowing canary rockfish retention after many years of prohibiting retention of canary rockfish. See the section entitled Inseason Management Response below for tools that could be implemented if necessary to keep total mortality within specified HGs.

Restrictions limiting the depth where groundfish fisheries are permitted are more severe in the area north of the Queets River (Marine Areas 3 and 4) where yelloweye and canary rockfish abundance is higher and therefore caught incidentally at a higher rate. Depth restrictions are fewer in the south coast where incidental catch of yelloweye and canary becomes progressively less. Washington coastal management areas are shown in Figure 4-3. Table 4-55 summarizes key features of the Washington recreational regulations under the No Action Alternative status quo option. Table 4-56 summarizes key features of the Washington recreational regulations under the No Action Alternative Option 1.

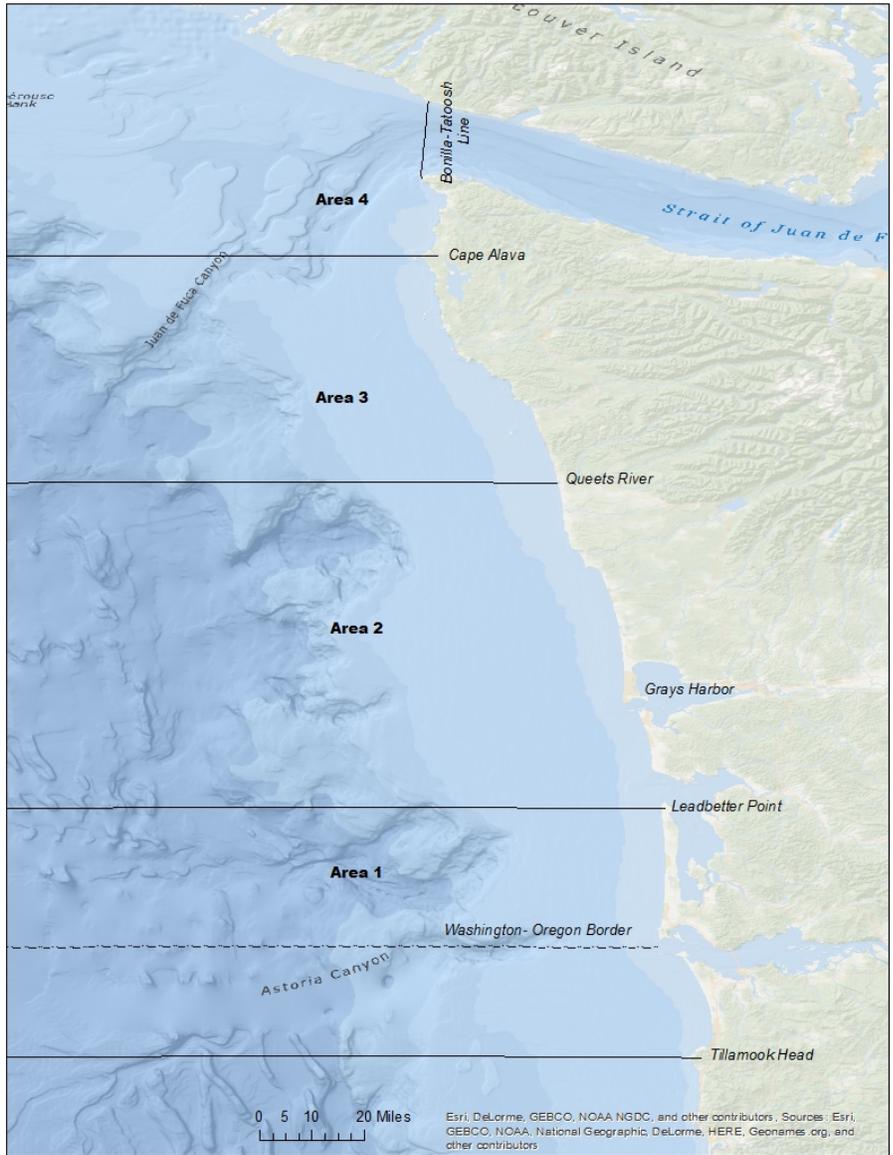


Figure 4-3. No Action. Washington Recreational Management Areas.

Table 4-55. No Action. Status Quo Washington Recreational Seasons and Groundfish Retention Restrictions.

Marine Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
3 & 4 (N. Coast)	BF Open				BF Open <20 fm May 9 - Labor Day a/			BF Open					
2 (S. Coast)	BF Open b/		BF Open <30 fm Mar 15 - June 15 b/ c/ d/ e/		BF Open b/								
1 (Col. River)	BF Open g/				BF Open f/g					BF Open g/			

a/ Retention of lingcod, Pacific cod and sablefish allowed >20 fm on days when Pacific halibut is open.

b/ Retention of lingcod prohibited seaward of line drawn from Queets River (47°31.70' N. Lat. 124°45.00' W. Lon.) to Leadbetter Point (46° 38.17' N. Lat. 124°30.00' W. Lon.) year round except on days open to the primary halibut fishery.

c/ Retention of sablefish and Pacific cod allowed > 30 fm from May 1- June 15.

d/ Retention of rockfish allowed > 30 fathoms

e/ Retention of lingcod allowed > 30 fathoms on days that the primary halibut season is open.

f/ Retention of groundfish, except sablefish, flatfish other than halibut, and Pacific cod, prohibited during the all-depth Pacific halibut fishery

g/ Retention of lingcod prohibited seaward of line drawn from Leadbetter Point (46° 38.17' N. Lat. 124°21.00' W. Lon.) to (46° 28.00' N. Lat. 124°21.00' W. Lon.) year round.

Table 4-56. No Action. Option 1 Washington Recreational Seasons and Groundfish Retention Restrictions, which includes a bottomfish closure from October 16 through March 14.

Marine Area	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
3 & 4 (N. Coast)	BF Closed		BF Open		BF Open <20 fm May 9 - Labor Day a/			BF Open		BF Closed		
2 (S. Coast)	BF Closed		BF Open <30 fm Mar 15 - June 15 b/ c/ d/ e/		BF Open b/						BF Closed	
1 (Col. River)	BF Closed		BF Open		BF Open f/g					BF Closed		

a/ Retention of lingcod, Pacific cod and sablefish allowed >20 fm on days when Pacific halibut is open.

b/ Retention of lingcod prohibited seaward of line drawn from Queets River (47°31.70' N. Lat. 124°45.00' W. Lon.) to Leadbetter Point (46° 38.17' N. Lat. 124°30.00' W. Lon.) year round except on days open to the primary halibut fishery.

c/ Retention of sablefish and Pacific cod allowed > 30 fm from May 1- June 15.

d/ Retention of rockfish allowed > 30 fathoms

e/ Retention of lingcod allowed > 30 fathoms on days that the primary halibut season is open.

f/ Retention of groundfish, except sablefish, flatfish other than halibut, and Pacific cod, prohibited during the all-depth Pacific halibut fishery

g/ Retention of lingcod prohibited seaward of line drawn from Leadbetter Point (46° 38.17' N. Lat. 124°21.00' W. Lon.) to (46° 28.00' N. Lat. 124°21.00' W. Lon.) March 15 - Oct 15.

North Coast (Marine Areas 3 and 4)

The retention of bottomfish is prohibited seaward of a line approximating 20 fm from May 9th through the first Monday in September (Labor Day), except lingcod, Pacific cod and sablefish can be retained seaward of 20 fm on days that Pacific halibut fishing is open. Outside of this time period, two options are under consideration. The status quo option (Table 4-55) provides 150 days more fishing opportunity compared to Option 1 (Table 4-56). Fishing for, retention, or possession of groundfish and Pacific halibut is prohibited in the C-shaped YRCA (Figure 4-4).

South Coast (Marine Area 2)

The retention of bottomfish, except rockfish, is prohibited seaward of 30 fm from March 15 through June 15, except sablefish and Pacific cod retention is allowed May 1 through June 15. Retention of lingcod is allowed seaward of 30 fm on days open to the primary Pacific halibut season. Fishing for, retention, or possession of lingcod is prohibited in deepwater areas seaward of a line extending from 47°31.70' N. latitude, 124°45.00' W. longitude to 46°38.17' N. latitude, 124°30.00' W. longitude year-round, except as allowed on days open to the Pacific halibut fishery (Figure 4-4). Fishing for, retention or possession of bottomfish or Pacific halibut is prohibited in the South Coast YRCA and Westport Offshore YRCA (Figure 4-4). Outside of this time period, two options are under consideration. The status quo option (Table 4-55) provides 150 days more fishing opportunity compared to Option 1 (Table 4-56).

Columbia River (Marine Area 1)

Retention of bottomfish, except sablefish, flatfish other than halibut, and Pacific cod, is prohibited with halibut onboard from May 1 through September 30, and fishing for, retention, or possession of lingcod in deepwater areas seaward of a line extending from 46°38.17' N. latitude, 124°21.00' W. longitude to 46°28.00' N. latitude, 124°21.00' W. longitude is prohibited year-round (Figure 4-4). Outside of this time period, two options are under consideration. The status quo option (Table 4-55) provides 150 days more fishing opportunity compared to Option 1 (Table 4-56).

Area Restrictions

Under the No Action Alternative, fishing for, retention, or possession of groundfish and halibut during the Washington recreational groundfish and Pacific halibut fisheries would be prohibited in the C-shaped YRCA in the north coast and the South Coast and Westport YRCAs in the south coast (Figure 4-4.a and b).

Fishing for, retention, or possession of lingcod would be prohibited seaward of a line connecting the following coordinates from the Queets River (47°31.70' N. latitude, 124° 45.00' W. longitude) to 46°28.00' N. latitude, 124°21.00' W. longitude, year-round except as allowed in Washington Marine Area 2 on days open to the primary Pacific halibut fishery (Figure 4-4.c).

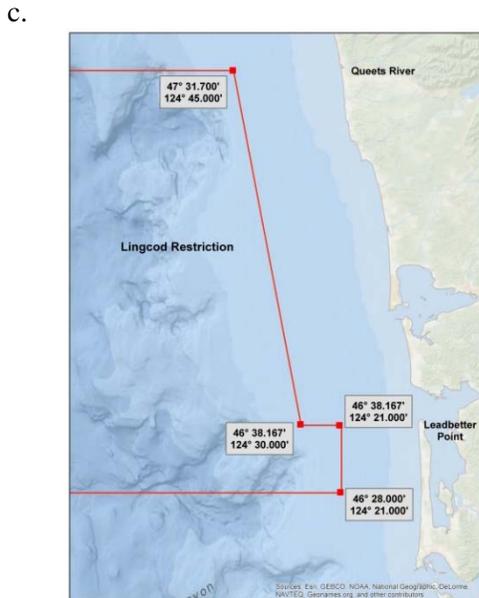
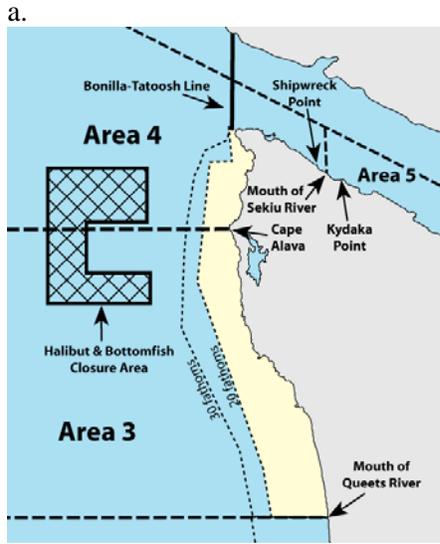


Figure 4-4. No Action Washington recreational area restrictions. a. C-Shaped YRCA; b. Washington South Coast and Westport YRCAs; c. Lingcod Restricted Area.

Groundfish Bag Limits

Under the No Action Alternative, two rockfish sub-bag limit options would be considered in addition to status quo. The two options differ from status quo by having reduced rockfish sub-limits. Option 1 would reduce the rockfish sub-bag limit from 10 to 8 rockfish per angler per day. Option 2 would reduce the rockfish sub-bag limit from 10 to 7 rockfish per angler per day which could include up to one canary rockfish.

- Status Quo: The recreational groundfish bag limit, including rockfish and lingcod, would be 12 fish per day. Of the 12 recreational groundfish allowed to be landed per day, sub-limits of 10 rockfish, and two lingcod would apply. Retention of canary and yelloweye rockfish would continue to be prohibited. The recreational bag limit would also include a sub-limit of two cabezon in Marine Areas 1-3 and one cabezon in Marine Area 4.
- Option 1: The recreational groundfish bag limit, including rockfish and lingcod, would be 12 fish per day. Of the 12 recreational groundfish allowed to be landed per day, sub-limits of 8 rockfish, and two lingcod apply. Retention of canary and yelloweye rockfish would continue to be prohibited. The recreational bag limit also includes a sub-limit of two cabezon in Marine Areas 1-3 and one cabezon in Marine Area 4.
- Option 2: The recreational groundfish bag limit, including rockfish and lingcod, would be 12 fish per day. Of the 12 recreational groundfish allowed to be landed per day, sub-limits of 7 rockfish including up to 1 canary rockfish, and two lingcod apply. Retention of yelloweye rockfish would continue to be prohibited. The recreational bag limit also includes a sub-limit of two cabezon in Marine Areas 1-3 and one cabezon in Marine Area 4.

Lingcod Seasons and Size Limits

The lingcod season in Marine Areas 1 through 3 (Washington-Oregon border at 46°16' N. latitude to Cape Alava at 48°10' N. latitude) would be open from the Saturday closest to March 15 through the Saturday closest to October 15. Marine Area 4 (Cape Alava to the U.S. Canadian border) would be open from April 16 through October 15, or the Saturday closest to October 15; whichever is earlier.

Under the No Action Alternative, the lingcod seasons and size limits by area would be as follows:

- Marine Areas 1-3: March 18 through October 14 in 2017 and March 17 through October 13 in 2018. Minimum size, 22 inches.
- Marine Area 4: April 16 through October 14 in 2017 and April 16 to October 13 in 2018. Minimum size, 22 inches.

Cabezon Size Limit

Under the No Action Alternative, there is an 18 inch minimum size limit for cabezon in Marine Area 4 (Cape Alava to the U.S. Canadian border).

Pacific Halibut Seasons

It is expected that the Pacific halibut seasons in 2017-2018 would be similar to the halibut seasons in 2015-2016. There are no changes to the restrictions on groundfish retention during the Pacific halibut season proposed under the No Action Alternative.

Additional Management Measures Analyzed

Season dates, lingcod closed areas, and rockfish sub-bag limits, in addition to status quo management measures, would be used to keep recreational harvests of overfished species within specified HGs.

Under the No Action Alternative, three Nearshore Rockfish HGs are being considered. The Washington HG options are 13.12 mt (Status Quo methodology), 25.6 mt (Option 1), and 16.93 mt (Option 2) for both 2017 and 2018. Under management measures being considered for the No Action Alternative, Nearshore Rockfish mortality is projected to be lower than the all of HG options (Table 4-57). See Inseason Management Response below for tools that could be implemented if necessary to keep total mortality within specified HGs.

Under the No Action Alternative, changes to the lingcod closure will be considered. Changes being considered would refine the current closed area by moving the southern boundary of the closed area to the north to increase access to healthy rockfish stocks while still minimizing encounters with yelloweye rockfish. WDFW will work with stakeholders to develop specific changes to the coordinates and will have a more detailed alternative specified and analyzed for April 2016.

Inseason Management Response

Projected mortality for Washington's recreational fishery is based upon the previous season's harvest estimated by the Ocean Sampling Program (OSP) and incorporated in Recreational Fishery Information Network (RecFIN). It should be noted that the precision of recreational groundfish catch estimates based upon previous seasons would continue to be influenced by factors such as the length and success of salmon and halibut seasons, weather and unforeseen factors.

Washington's OSP is able to produce estimates of groundfish catch with a one month lag time. Management measures such as more restrictive depth closures, area closures, groundfish retention restrictions, or changes to seasons can be considered and implemented through emergency changes to state regulations if inseason catch reports indicate that recreational harvests of overfished species or non-overfished species are exceeding pre-season projections to the point where HGs are at risk of being exceeded.

Impact (Groundfish Mortality)

Projected mortality for overfished and non-overfished species under the No Action Alternative is summarized in Table 4-57. The No Action Alternative includes rockfish sub-bag limit options and a recreational season option. Only the rockfish sub-bag limit options impact projected mortality for yelloweye, canary, and black rockfish. The recreational season option that would close the groundfish fishery from October 15 through March 14 is expected to have no effect on projected mortality because there is very little fishing effort and catch during this period. Fishing effort that would normally occur during the closed period may shift to months adjacent to the closed period (March and October) and result in little impact compared to recent years but may prevent future winter fishing effort from increasing.

The rockfish sub-bag limits had the most impact on projected mortality of black rockfish as the proportion of black rockfish caught is very high compared to other species of rockfish. Under the rockfish sub-bag limit Option 1, where the sub-bag limit would be reduced from 10 to 8 rockfish, canary rockfish retention would not be permitted. Under this Option, projected canary mortality is 1.6 mt. Under the Option 2, the rockfish sub-bag limit would be reduced from 10 to 7 rockfish, including the retention of up to one canary rockfish. Option 2 results in an increase in projected impacts for canary rockfish (2.60 mt) and a further reduction in projected impacts to black rockfish. Canary rockfish projected impacts under both rockfish

sub-bag limit options are substantially lower than the recreational HG of 53 mt and 49 mt for canary rockfish in 2017 and 2018, respectively. As stated above, management measures in place for the Washington recreational fishery continue to be driven by the need to keep yelloweye mortality under small harvest guidelines. These measures limit access to canary rockfish and keep projected impacts low even under rockfish bag limit alternatives that allow the retention of canary rockfish after many years of being a prohibited species. Projected canary rockfish impacts do not take into account changes in angler behavior that may lead to targeting; however, inseason management responses are available to control catch.

Yelloweye rockfish mortality is projected to be reduced slightly from status quo under both of the bag limit options (Table 4-57). It is difficult to know how yelloweye mortality will be affected under Option 2 which allows retention of canary rockfish, since canary rockfish retention has been prohibited for several years. Anglers may mistake yelloweye rockfish for canary rockfish and the lower projected impacts may not be realized or could be higher than projected. For these reasons, a precautionary approach is being taken with changes to rockfish bag limits that allow the retention of canary rockfish.

Table 4-57. No Action – Washington Recreational. Projected mortality under the No Action Alternative, including bag limit Options 1 and 2.

Stock	2017/2018	
	Bag Limit Option 1	Bag Limit Option 2
Canary Rockfish	1.60	2.60
YELLOWEYE ROCKFISH	2.73	2.56
Black Rockfish	253.43	215.18
Lingcod	112.00	112.00
Nearshore Rockfish	5.00	5.00
Blue Rockfish	1.17	1.17
Quillback Rockfish	1.14	1.14
Copper Rockfish	0.87	0.87
China Rockfish	1.47	1.47
Brown Rockfish	-	-
Grass Rockfish	-	-
Yellowtail Rockfish	37.37	37.37
Vermilion Rockfish	1.00	1.00
Cabezon	5.00	5.00
Kelp Greenling	1.20	1.20

4.1.1.9 Oregon Recreational – No Action

Primary catch controls for the Oregon recreational fishery are season dates, depth closures, bag limits, and GCAs, including YRCAs. The No Action Alternative analyzes the Oregon recreational fishery under the default HCR ACLs and Oregon recreational HGs or presumed state quotas (Table 4-58).

The west coast states will be responsible for tracking and managing catches of Nearshore Rockfish north of 40°10' N. latitude, as described in Section 0. If harvest levels in Oregon approach 75 percent of the state-specific HG (Table 4-8), the state of Oregon will consult with the other west coast states via a conference call and determine whether inseason action is needed. The HG for Oregon would be a state HG

and not established in Federal regulations (Table 4-54). In the event inseason action is needed, the state of Oregon would take action through state regulation. Inseason updates would be provided to the Council at the September and November meetings.

Table 4-58. No Action. Oregon recreational Federal harvest guidelines (HG) or state quotas under the No Action Alternative (mt).

Stock	2017 HG a/	2018 HG a/
Canary Rockfish	183.0	169.2
YELLOWEYE ROCKFISH	3.0	3.0
Black Rockfish OR ^{b/}	400.1	394.7
Greenlings c/	41.1	34.9
Nearshore Rockfish North of 40°10' N. Lat. d/	44.5	44.5

a/ Federal HG are established for canary and yelloweye rockfish only. The state process in Oregon establishes quotas for black rockfish, blue rockfish, other Nearshore Rockfish, and greenlings (all species). The state quotas, which are yet to be determined are not intended to be implemented in Federal regulation, they are only provided as information.

b/ The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.

c/ Includes kelp and other greenlings. The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.

d/ Includes blue rockfish. The state of Oregon has a Federal HG for Nearshore Rockfish North of 40°10' N. Lat. of 50.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive share based on 2015 recreational and commercial sharing percentages in Oregon State Regulations.

Groundfish Seasons and Area Restrictions

Season structure

Under the No Action Alternative, the Oregon recreational groundfish fishery would be open offshore year-round, except from April 1 to September 30 when fishing is only allowed shoreward of 40 fathoms, as defined by waypoints (Figure 4-5). This is the season structure in place in 2016. Closing the fishery deeper than 40 fathoms from April 1 to September 30, months when angler effort and yelloweye rockfish encounters are greatest, mitigates mortality of yelloweye rockfish. Canary rockfish and Minor Nearshore Rockfish Complex North species would be part of the ten fish marine bag (no sub-bag limits). Projected mortality of yelloweye and canary rockfish are within the Federal HGs, therefore the shore-based fishery would be open year-round.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bottomfish Season	Open all depths			Open < 40 fm a/						Open all depths		
Marine Bag Limit b/	Ten (10)											
Lingcod Bag Limit	Three (3)											
Flatfish Bag Limit c/	Twenty Five (25)											

a/ From April 1 through September 30, the marine bag limit is Ten (10) fish per day, of which no more than one (1) may be cabezon.

b/ Marine bag limit includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine, and smelt

c/ Flounders, soles, sanddabs, turbot and halibuts except Pacific halibut

Figure 4-5. Oregon recreational groundfish season structure and bag limits under the No Action Alternative.

Area Closures

The Stonewall Bank YRCA has been in place since 2006 and would also remain under the No Action alternative (Figure 4-6). The YRCA is located approximately 15 miles west of the Port of Newport and consists of the high-relief area of Stonewall Bank, an area of high yelloweye rockfish encounters. No recreational fishing for groundfish and Pacific halibut can occur within this YRCA, which is bounded by the waypoints contained in Table 4-58.

Two Options for extending the status quo Stonewall Bank YRCA for 2017-2018 recreational fisheries, should they become necessary, are also shown in Figure 4-6 and are defined by the coordinates in Table 4-59.

Table 4-59. Coordinates for the Stonewall Bank currently as specified in regulation, for the expanding the Stonewall Bank area closure under.

Current		Option 2		Option 3	
Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
44°37.458' N.	124°24.918' W.	44°41.7594' N.	124°30.018' W.	44°38.544' N	124°27.4122' W
44°37.458' N.	124°23.628' W.	44°41.7348' N.	124°21.603' W.	44°38.544' N	124°23.8554' W
44°28.710' N.	124°21.798' W.	44°25.2456' N.	124°16.944' W.	44°27.132' N	124°21.501' W
44°28.710' N.	124°24.102' W.	44°25.2942' N.	124°30.1404' W.	44°27.132' N	124°26.8944' W
44°31.422' N.	124°25.500' W.	44°41.7594' N.	124°30.018' W.	44°31.302' N	124°28.3476' W

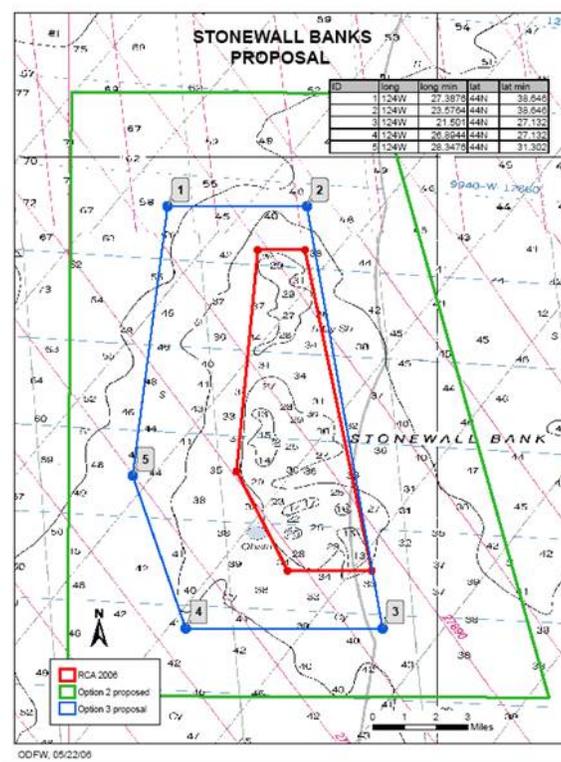


Figure 4-6. The Stonewall Bank Yelloweye Rockfish Conservation Area where recreational fishing for groundfish and Pacific halibut is prohibited with two options for expanding the closed area.

Groundfish Bag Limits and Size Limits

Under the No Action Alternative, the marine fish daily bag limit of 10 fish in aggregate that was allowed in 2016 Oregon recreational fisheries would carry forward for 2017-2018 (Figure 4-5).

The marine bag includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine and smelt. A flatfish daily bag limit of 25, which includes all soles and flounders except Pacific halibut, was allowed in addition to the marine fish daily bag limit. Additionally a three-fish bag limit was allowed for lingcod. Retention of yelloweye rockfish was prohibited in 2016 and would continue to be prohibited under the No Action Alternative. In 2016, a one-fish sub-bag limit of canary rockfish was allowed. With canary rockfish rebuilt and the increased ACL, and Oregon recreational HG, canary rockfish would become part of the 10-fish marine fish daily bag limit, there would be no sub-limit.

The following minimum size limits applied to the 2016 Oregon recreational fisheries and would be carried forward under the No Action Alternative:

- Lingcod – 22 in.
- Cabezon – 16 in.
- Kelp greenling – 10 in.

Pacific Halibut

Under the No Action Alternative, the recreational Pacific halibut fisheries should be able to proceed as in 2016, in regards to days and areas open, etc., depending on the halibut quota. Since 2009, only sablefish and Pacific cod may be retained in the Pacific halibut fishery at any depth in the area north of Humbug Mountain, Oregon. Beginning in 2015, other flatfish species were also allowed. South of Humbug Mountain, groundfish may be retained in areas open to groundfish (e.g., less than 30 fm) when halibut are onboard the vessel. It is expected that groundfish retention in the all-depth Pacific halibut fishery would be similarly limited in 2017-2018 under the No Action Alternative.

Additional Considerations

Under the No Action Alternative, three Nearshore Rockfish HGs are being considered. The Oregon HG options are 60.5 mt (Status Quo methodology), 36.2 mt (Option 1), and 46.1 mt (Option 2) for both 2017 and 2018. Depending on the sharing of the Minor Nearshore Rockfish Complex N of 40°10' allocation between the states, reduced bag limits (i.e. species specific sub-bag limits) for species in this complex may be necessary to keep impacts within the Oregon recreational fishery state cap. Currently there is a 3-fish sub-bag limit for blue rockfish and no retention of copper, quillback, or China rockfish specified in state regulations. Adjustments to routine and currently available management measures would be used to keep recreational harvests of overfished species within specified Federal HGs under No Action.

At its March 2016 meeting, the Council is scheduled to take final action regarding the development of a midwater recreational fishery for yellowtail rockfish in Oregon. If the Council recommendation is approved by NMFS and recommend for implementation by Oregon, then increased yellowtail rockfish mortality may occur. This increased mortality would be within the established limits.

New Management Measures

Two additional management measures were analyzed for the Oregon recreational fisheries: removing the kelp greenling minimum size limit and allowing fishing for flatfish (other than Pacific halibut) outside of the 40-fathom seasonal depth restriction (Appendix B).

Additionally, a variety of season structure (depths and months) were modeled to determine potential mortality to overfished species.

Inseason Management Tools

Oregon has a responsive port-based monitoring program through ORBS, and regulatory processes in place to track mortality and take actions inseason if necessary. The following are suggested management measures that could be implemented inseason if the fishery does not proceed as expected.

Inseason management tools, designed to mitigate mortality, include bag limit adjustments (including non-retention), length limit adjustments, gear restrictions, and season, days per week, depth, and area closures.

Season, depth, days open per week, and area closures are the primary inseason tools for keeping total impacts within the Oregon recreational sector-specific harvest targets for yelloweye, canary, and black rockfish, and the Minor Nearshore Rockfish complex north of 40°10' N latitude. If catch rates indicate that the harvest targets for any of these species would be reached prematurely, offshore depth closures may be adjusted inseason at 30, 25, or 20 fathoms depending on species. Additionally, days per week may also be closed to reduce mortality. Regulations would depend upon the timing of the determination for their need.

Adjustments to the marine fish daily bag limit to no more than 10 fish may be implemented to achieve season duration goals in the event of accelerated or decelerated black rockfish or Nearshore Rockfish Complex species harvest. The lingcod daily bag limits may be adjusted to no more than 3 fish in the event the marine bag limit changes or the halibut catch limit is reduced from 2015 levels. Season and/or area closures may also be considered if harvest targets are projected to be attained. Closing one or more days per week is an inseason tool that could be used to limit mortality. Closing certain days each week would help lengthen the duration of a fishery approaching an HG.

Non-retention and length restrictions are the inseason tools used for cabezon and greenling species, as release survival is very high. They may also be used to reduce mortality of nearshore species, such as black rockfish and other Nearshore Rockfish Complex species.

Gear restrictions and/or release technique requirements may be implemented to reduce the impact of overfished rockfish since a variety of descending devices are available. The SSC recommended and Council-approved mortality rates for canary and yelloweye rockfish when descending devices are used were implemented in 2014.

Directed yellowtail rockfish and/or flatfish fisheries may be implemented inseason, as were implemented in 2004, in the event of a closure of the recreational groundfish fishery due to attainment Federal or state HGs or targets. Specific gear restrictions may be implemented in the event that yellowtail rockfish fishing remains open during a groundfish closure. Additionally, the fishery may be expanded to waters seaward of the RCA, promoting directed yellowtail rockfish opportunity. Fisheries would be monitored to ensure that mortality of yelloweye rockfish are within the harvest targets/guidelines.

In the event that the duration of total season is reduced from 12 months; the nearshore waters are closed to groundfish fishing due to management of nearshore species; or the Pacific halibut catch limit is reduced from 2015 levels, the fishery may be expanded to waters seaward of the RCA that is in effect at the time, promoting directed yellowtail rockfish and offshore lingcod opportunity. Fisheries would be monitored to ensure that mortality of yelloweye rockfish is not in excess of the HG.

Impacts (Projected Mortality)

The annual projected mortality presented in Table 4-60 is anticipated, given the season structure and bag limits detailed above, with the exception of canary rockfish. The projected impacts for canary rockfish are highly uncertain. All data that is used in the model is for time periods when anglers were encouraged to avoid canary rockfish, and were required to discard when encountered. Limited retention of canary rockfish was allowed beginning in 2015 when a one fish sub-bag limit was put into place. Inseason tracking through November 2015, with a one fish sub-bag limit, estimated the projected mortality to be 14.8 mt, only 2.3 mt less than what the model is projecting for a 10 fish bag limit for the entirety of 2017. With an increased bag limit, mortality would be expected to be greater than under a one fish sub-bag limit; however the model currently does not have enough retention data (only one year with a one fish sub-bag limit) to provide a certain estimate (i.e. the estimate is highly uncertain). Yelloweye rockfish impacts continue to be the most constraining in terms of setting the season structure under No Action.

At the March 2016 meeting, the Council approved an alternative that would allow midwater long-leader recreational groundfish fishing seaward of a line approximating the 40 fm depth curve exclusively off the coast of Oregon (42°00' N. lat. to 46°18' N. lat.) from April-September to target abundant and healthy midwater species while avoiding or minimizing interactions with overfished rockfish species. Supplemental analysis is underway to inform revised groundfish mortality estimates for the Oregon recreational fisheries.

Table 4-60. No Action – Oregon Recreational. Projected Mortality (mt) of species with Oregon recreational specific allocations under the No-Action Alternative.

Stock	Projected Mortality
Canary rockfish	17.1
YELLOWEYE ROCKFISH	2.9
Black Rockfish OR	353.2
Greenlings ^{a/}	6.4
Nearshore Rockfish North of 40°10' N. lat. ^{b/}	35.6

^{a/} Includes kelp and other greenlings

^{b/} Includes blue rockfish. The state of Oregon has a Federal HG of Nearshore Rockfish North of 40°10' N. Lat. of 60.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries.

Table 4-61 shows the recent mortality of the ten most landed species in the Oregon recreational fishery, including black rockfish. Species in Table 4-61, other than black rockfish, had not been modeled prior to 2015-2016. This table represents recent mortality under similar season structure and bag limits to what will be in place under the No Action Alternative.

Table 4-61. No Action – Oregon Recreational. Recent mortality (mt) of the ten most landed species in the Oregon recreational fishery under the season structure, bag limits, area restrictions, etc. in the No-Action Alternative.

Species	2010	2011	2012	2013	2014	Average
Black Rockfish	302.4	206.1	217.4	312.8	346.7	277.1
Lingcod	82.8	105.9	148.9	215.5	169.3	144.5
Nearshore Rockfish	32.8	36.6	45.9	37.3	26.6	35.8
Blue Rockfish ^{a/}	22.0	21.4	26.1	23.9	18.8	22.4
Quillback Rockfish	4.2	5.7	8.8	5.6	3.5	5.6
Copper Rockfish	3.8	5.9	7.2	4.1	2.5	4.7
China Rockfish	2.6	3.4	3.7	3.6	1.7	3.0
Brown Rockfish	0.1	0.1	0.0	0.1	0.0	0.1
Grass Rockfish	0.1	0.0	0.0	0.0	0.0	0.0
Cabezon	16.5	17.5	15.5	12.6	9.3	14.3
Yellowtail Rockfish	7.5	11.6	13.9	15.7	11.6	12.1
Kelp Greenling	6.8	7.4	7.0	7.9	3.9	6.6
Vermillion Rockfish	4.6	6.0	9.2	6.2	3.7	5.9
Canary Rockfish	3.2	3.2	2.7	3.4	3.0	3.1
YELLOWEYE ROCKFISH	2.1	2.1	3.3	3.1	2.6	2.6
Sablefish	0.1	0.5	0.3	0.8	0.8	0.5

^{a/} Blue Rockfish was managed separately from the rest of the nearshore rockfish complex under Oregon state regulations through 2014

4.1.1.10 California Recreational – No Action

Under No Action, trawl and non-trawl allocations for overfished species and canary rockfish would be established (Table 4-62). The California recreational fishery was allocated a share of the non-trawl allocation, through use of a HG, for bocaccio, canary rockfish, and yelloweye rockfish to ensure that total non-trawl catches remained within the non-trawl allocations for these species. Further, there is a 198.3 mt Federal HG for blue rockfish south of 42° N. latitude within the Nearshore Rockfish complex which is shared by both commercial and recreational sectors. Additionally, a HG would be in place for Nearshore Rockfish north of 40°10' N latitude; the Council is considering three HG options which range from 29.6 mt (Option 1) to 41.4 mt (Option 2) in 2017. In California these HG's would be shared by both commercial and recreational fisheries.

Table 4-62. No Action – California Recreational: Overfished species allocations (mt) to the non-trawl sector and shares (mt) for the California recreational fisheries under No Action in 2017 and 2018 as in the 2016 in the 2015-2016 FEIS.

Stock	Non-Trawl Allocation	California Recreational HG
BOCACCIO	596.0/558.8	411.6/385.9
Canary rockfish	780.6/721.7	380.1/351.4
COWCOD	2.6	
DARKBLOTCHED	18.9/19.6	
Nearshore rockfish North of 40°10' N lat.		29.6
POP	7.3/7.6	
PETRALE SOLE	144.8/138.6	
YELLOWEYE ROCKFISH	12.9	3.9

Groundfish Seasons and Area Restrictions

The 2017-2018 California recreational groundfish season structure options and projected mortality are based on CDFW's updated RecFISH model. Model projections were calculated for the five recreational groundfish management areas using updated 2013 and 2014 RecFIN estimates; overfished species mortality are reported statewide. Figure 4-7. California Recreational Management Areas. Figure 4-7 displays the five recreational groundfish management areas in California.

In California, the recreational fisheries for 2017-2018 are constrained by black rockfish and yelloweye rockfish. As a result, four different options were explored to examine possible opportunities and tradeoffs between season length and depth, while remaining within allowable limits. This range of options was in part informed by public input gathered during five public workshops.

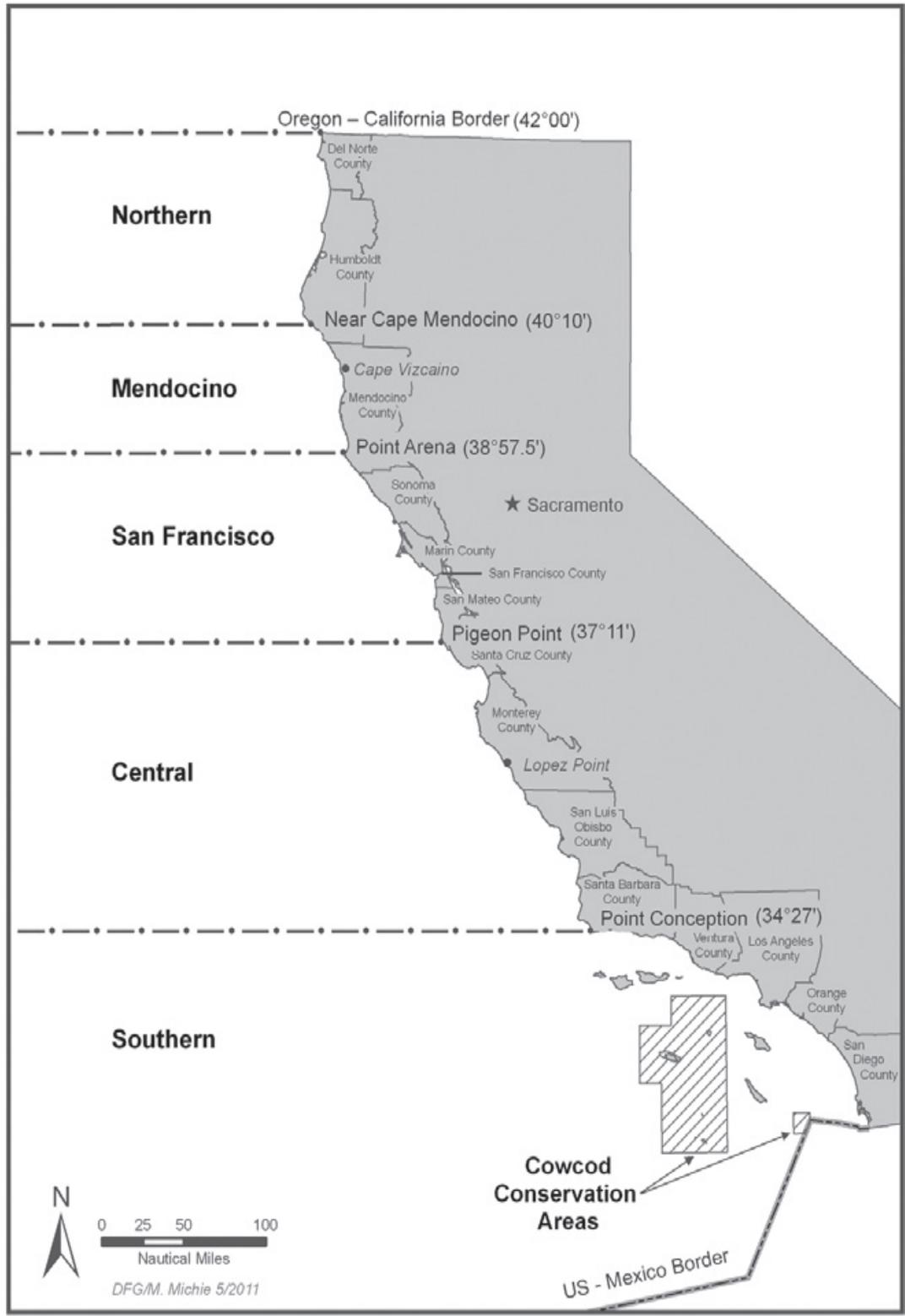


Figure 4-7. California Recreational Management Areas.

Option 1

Option 1 examines projected mortality assuming the same season structure that was in place for 2016 (Figure 4-8). The 2016 season structure for California scorpionfish would remain unchanged (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 15 – Oct 31 <20 fm						Closed	
Mendocino	Closed				May 15 – Oct 31 <20 fm						Closed	
San Francisco	Closed			April 15 – Dec 31 <30 fm								
Central	Closed			April 1 – Dec 31 <40 fm								
Southern	Closed	Mar 1 – Dec 31 <60 fm										

Figure 4-8. Option 1: California recreational groundfish season structure assuming the same season structure as in 2016.

Option 2

In the management areas north of Point Arena, Option 2 explores providing additional season length and removing depth restrictions during the winter months. Black rockfish are important to the recreational fishery in the Northern Management Area and this option attempts to provide additional opportunities in light of reductions to the allowable take of black rockfish. While black rockfish historically are less important to the Mendocino Management Area, this area has the shortest season lengths due to high yelloweye rockfish encounters. Providing access to increased depth in the Northern area is intended to reduce pressure on black rockfish, while retaining the 2016 depth restriction during months expected to have higher effort is necessary to minimize yelloweye rockfish impacts (Figure 4-9). The 2016 season structure would remain in place for all management areas south of Point Arena including the season structure for California scorpionfish (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	All Depth				May 15 – Sept 30 <20 fm						All Depth	
Mendocino	Closed				May 15 – Sept 31 <20 fm						Nov1- Dec31<30fm	
San Francisco	Closed			April 15 – Dec 31 <30 fm								
Central	Closed			April 1 – Dec 31 <40 fm								
Southern	Closed	Mar 1 – Dec 31 <60 fm										

Figure 4-9. Option 2: California recreational groundfish season structure with length and depth modifications north of Point Arena; 2016 season structure would remain in place south of Point Arena.

Option 3

Under Option 3, the 2016 season structure would remain in place in all management areas, except that the depth restriction would be liberated by 10 fm in all management areas north of Point Conception (Figure 4-10). By increasing the allowable depth in those areas north of Point Conception pressure on black rockfish would likely be reduced while remaining within allowable impacts for yelloweye rockfish. The 2016 season structure for California scorpionfish would also remain unchanged (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed				May 15 – Oct 31 <30 fm						Closed	
Mendocino	Closed				May 15 – Oct 31 <30 fm						Closed	
San Francisco	Closed			April 15 – Dec 31 <40 fm								
Central	Closed			April 1 – Dec 31 <50 fm								
Southern	Closed	Mar 1 – Dec 31 <60 fm										

Figure 4-10. Option 3: California recreational groundfish season structure maintaining the 2016 season length, while liberalizing the 2016 depth restriction by 10 fm north of Point Conception.

Option 4

Option 4 explores the tradeoff between season length and an all depth fishery in all management areas (Figure 4-11). Due to yelloweye rockfish impacts, season length must be limited to three months to remain within allowable limits. Impacts to all target species are greatly reduced under Option 4 compared to the other options. The 2016 season structure for California scorpionfish would also remain unchanged (i.e., January 1 through August 31).

Management Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Northern	Closed						All Depth			Closed		
Mendocino	Closed						All Depth			Closed		
San Francisco	Closed						All Depth			Closed		
Central	Closed						All Depth			Closed		
Southern	Closed						All Depth			Closed		

Figure 4-11. Option 4: California recreational groundfish season structure under an all depth fishery statewide.

Additional Considerations

Minor Nearshore Rockfish Harvest Guideline North of 40° 10' N. latitude.

At its September meeting, the Council chose to consider three different options for the Minor Nearshore Rockfish HG north of 40° 10' N lat. The California HG varies among the options, ranging from a low of 29.6 mt (Option 1) to a high of 41.4 mt (Option 2) in 2017; these values increase in 2018. The Minor Nearshore Rockfish HG is shared between the commercial and recreational fisheries in California. The season structure options presented here would apply under each of the Nearshore Rockfish north of 40° 10' N. lat. HG alternatives.

New Management Measures

Overfished Species Hotspot Closures

Over the winter, CDFW conducted a series of five public workshops, where locations of overfished species (OFS) hotspots were identified by the public. Given that black rockfish constrains opportunities in the recreational fishery, allowing increased opportunity in deeper depths may be a viable option to relieve pressure on black rockfish. However, given that encounters with OFS are likely to increase as effort is

shifted to deeper depths, the OFS Hotspot closures identified by the public are likely a viable method to reduce those impacts.

It should be noted that in 2009, four yelloweye rockfish conservation areas (YRCA) were adopted in the Northern and Mendocino Management Areas for use in management. To date, these YRCAs have not been implemented and would remain available under all alternatives. Utilizing these YRCAs in combination with OFS Hotspot closures could further mitigate OFS impacts, especially if liberalizing depth restrictions are contemplated.

New Inseason Process

A new inseason process is being considered for select species in the event that target amounts are attained, thereby allowing NMFS in consultation with CDFW to modify the season structure, bag limits and/or close portions of the recreational fishery. In addition to OFS hotspot closures, this measure would be another mechanism to keep mortality within allowable limits, especially if access to deeper depths is contemplated.

Exempt Petrale Sole from Season and Depth Restrictions

CDFW received a request to allow retention of petrale sole outside of the groundfish season structure (i.e. similar to Pacific sanddab). Petrale sole are encountered when targeting other species (e.g. Pacific halibut and Pacific sanddabs), therefore allowing year round retention would reduce regulatory discards while fishing for other species.

Groundfish Bag Limits and Size Limits

Under all Alternatives and season structure options, a statewide 10 fish rockfish, cabezon, and greenling (RCG) complex bag limit with a sub-bag limit of 3 cabezon would remain in place. Retention of bronzespotted rockfish, cowcod, and yelloweye rockfish would continue to be prohibited. The following bag limits would also apply:

- California scorpionfish – 5 fish
- Leopard shark – 3 fish (state regulations only)
- Soupfin shark – 1 fish (state regulations only)

There is no bag limit for Pacific sanddab, petrale sole and starry flounder. A bag limit of 10 fish of any one species within the 20 finfish maximum bag limit would apply to the remaining species in the Groundfish FMP.

The following minimum size limits for the California recreational fisheries would remain in place under all Alternatives and season structure options:

- California scorpionfish – 10 inches
- Cabezon – 15 inches
- Kelp greenling – 12 inches
- Leopard shark – 36 inches (state regulations only)
- Lingcod – 22 inches

Additional Considerations

Modifications to sub-bag or bag limits are not expected to impact angler trips and impacts to overfished species are anticipated to be minimal if any.

Black rockfish – In 2016, the black rockfish sub-bag limit was five fish within the 10 fish RCG complex bag limit. However, due to a lower annual catch limit for 2017 and 2018, further reductions to the black rockfish sub-bag limit in some or all areas will likely be required to remain within allowable limits under all season structure options, except Option 4.

A range of sub-bag limits from two to five fish was explored. Projected mortality for the range of bag limits can be found in Table 4-63 through Table 4-66. A three fish sub-bag limit would be needed statewide under season structure Options 1 and 3; while under Option 2 a statewide sub-bag limit of two fish would be needed. Under Option 4 a five-fish sub-bag limit can be accommodated statewide.

Bocaccio – CDFW received a request from industry to increase the sub-bag limit for bocaccio. In 2016, the sub-bag limit for bocaccio was three fish within the 10 fish RCG complex bag limit. Since the recreational HG of bocaccio will be increasing in 2017 and 2018 an increase of the sub-bag limit can be accommodated under all the season structure options.

A range of sub-bag limits from four to 10 fish was explored. Projected mortality for a three and four fish sub-bag limit under the various season structure options can be found in Table 4-63, Table 4-64, Table 4-65, Table 4-66 under Options 1 through 4, respectively.

Canary Rockfish – Canary rockfish was declared rebuilt in 2015. Since the recreational HG will be increasing for 2017 and 2018 allowing limited retention (i.e. sub-bag limit within the 10 fish RCG limit) can be accommodated under all season structure options.

A range of sub-bag limits from one to five fish was explored. Projected mortality for non-retention and a one fish sub-bag limit under the various season structure options can be found in Table 4-63, Table 4-64, Table 4-65, and Table 4-66 under Options 1 through 4, respectively. Projected mortality under various sub-bag limits from two to five fish is provided in Appendix B.

Lingcod – CDFW received a request from industry to reduce the lingcod bag limit from three fish to two fish. In recent years lingcod catches in the recreational sector have increased and attainment of the non-trawl allocation for lingcod south of 40° 10' N. latitude has been high.

A range of bag limits from two to three fish was explored. Projected mortality for a two and three fish bag limit under the various season structure options can be found in Table 4-63, Table 4-64, Table 4-65, and Table 4-66 under Options 1 through 4, respectively.

Impact (Groundfish Mortality)

CDFW closely monitors yelloweye rockfish and cowcod – performing weekly tracking using preliminary California Recreational Fisheries Survey (CRFS) field reports. These preliminary CRFS reports are converted into an anticipated catch value in metric tons using catch and effort data from previous years. This weekly "proxy" value is then used to approximate catch during the five to eight week lag time in CRFS catch estimates. In addition to weekly tracking, CDFW also tracks catch of target species inseason once estimates are available. If angler effort or bycatch of overfished groundfish species changes dramatically from prior years, actual mortality can be higher or lower than projected. Based on the inseason tracking, if any allowable limits are projected to be attained inseason, CDFW could take action to slow and/or reduce catches. This could include closing one or more recreational groundfish management areas, restricting recreational fishery seasons, modifying depth restrictions and/or bag limits.

California's RecFISH model is used to project mortality in the recreational fishery and is explained in greater detail in Appendix A. In general, for months and/or depths which have not been open in recent

years, the proportion of catch by depth and time during a historic period with a year round, all-depth fishery is used to back-calculate expected mortality in an unregulated season; the desired months and depths are then selected and the projected mortality summed to determine the projected mortality of a given species for the season structure under consideration. While this is the best available science, there are some known uncertainties, particularly when projecting mortality from deeper depths; further, for species where encounters are relatively rare events (e.g., yelloweye rockfish), data availability is limited in some depth bins.

One assumption is that angler behavior during the historic period will be similar to that of the current fishery. However, anglers during the historic period did not have to avoid or limit interactions with nearshore stocks, as will likely be needed in 2017 and 2018 (e.g. black rockfish). Further, allowing access to previously closed depths may also create an ‘opener’ effect. As a result, greater than expected effort may shift to deeper depths and while this may likely occur, the amount of effort shifting to deeper depths cannot be quantified. However, utilizing existing YRCAs and implementing additional OFS hotspot closures may be viable options to mitigate uncertainty in the model.

Option 1

Table 4-63 provides projected mortality under season structure Option 1. Season structure under Option 1 is provided in Figure 4-8. A five fish sub-bag limit for black rockfish cannot be accommodated statewide under this season structure option; however a three fish sub-bag limit can.

Model uncertainty is relatively minimal when compared to the other season structure options because the season structure is similar to 2016. Provided behavior does not change dramatically in 2017 and 2018, mortality is expected to be similar to previous years with the same season structure.

Table 4-63. California Recreational Season Structure Option 1: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	137.0 (146.3)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	23.6 (30.3)	380.1/351.4	780.6/721.7
COWCOD	2.1		2.6
YELLOWEYE ROCKFISH	1.5	3.9	12.1
Black Rockfish (3)	(226.8)		
Blue Rockfish	138.3	305/311	
Cabazon	33.4		
California Scorpionfish	96.7		
Greenlings	10.1		
Lingcod N. of 40°10' N. lat. (2)b/	74.6		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	482.2 (402.2)		515.3/624.8
Widow Rockfish	25.7		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	5.6		
Nearshore Rockfish S. of 40°10' N. lat.	329.1		

a/ Includes non-nearshore, nearshore, and recreational.

b/ Only includes the area between 42° N. lat. and 40° 10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40° 10' N lat.

Option 2

Table 4-64 provides projected mortality under season structure Option 2. Season structure under Option 2 is provided in Figure 4-9. A five fish sub-bag limit for black rockfish cannot be accommodated statewide under this season structure option; this option can only be accommodated with a two fish sub-bag limit statewide.

Model uncertainty is greater under Option 2 when compared to Option 1. The uncertainty is created by allowing for an all-depth fishery in the Northern Management Area; coupled with allowing an additional 10 fm in the Mendocino Management Area which generally experiences the highest yelloweye rockfish impacts in California. As a result, actual mortality may differ from projections.

Table 4-64. California Recreational Season Structure Option 2: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation ^{a/}
BOCACCIO (4)	137.0 (146.3)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	23.5 (30.2)	380.1/351.4	780.6/721.7
COWCOD	2.1		2.6
YELLOWEYE ROCKFISH	1.9	3.9	12.1
Black Rockfish (2)	(152.9)		
Blue Rockfish	135.0	305/311	
Cabazon	33.3		
California Scorpionfish	96.7		
Greenlings	10.5		
Lingcod N. of 40°10' N. lat. (2) b/	94.3 (74.2)		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	469.4 (392.0)		515.3/624.8
Widow Rockfish	26.0		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	9.7		
Nearshore Rockfish S. of 40°10' N. lat.	325.8		

a/ Includes non-nearshore, nearshore, and recreational.

b/ Only includes the area between 42° N. lat. and 40° 10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40° 10' N lat.

Option 3

Table 4-65 provides projected mortality under season structure Option 3. Season structure under Option 3 is provided in Figure 4-10. A five fish sub-bag limit for black rockfish cannot be accommodated statewide under this season structure option; however a three fish sub-bag limit can.

Because Option 3 maintains the 2016 season length, while providing a 10 fm liberalization from the 2016 depth restriction, model uncertainty is less than that of Option 2 which allows for increased depth north of Point Arena.

Table 4-65. California Recreational Season Structure Option 3: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	159.3 (169.3)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	33.0 (42.3)	380.1/351.4	780.6/721.7
COWCOD	2.2		2.6
YELLOWEYE ROCKFISH	3.7	3.9	12.1
Black Rockfish (3)	(202.2)		
Blue Rockfish	146.1	305/311	
Cabazon	31.1		
California Scorpionfish	96.7		
Greenlings	9.2		
Lingcod N. of 40°10' N. lat. (2) b/	76.0 (59.9)		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	483.5 (401.8)		515.3/624.8
Widow Rockfish	30.3		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	6.4		
Nearshore Rockfish S. of 40°10' N. lat.	341.8		

a/ Includes non-nearshore, nearshore, and recreational.

b/ Only includes the area between 42° N. lat. and 40°10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40°10' N. lat.

Option 4

Table 4-66 provides projected mortality under season structure Option 4. Season structure under Option 4 is provided in Figure 4-11. All bag limits under consideration (including those in place in 2016) can be accommodated under Option 4. A statewide five fish sub-bag limit for black rockfish can be accommodated under this season structure option.

Model projections under Option 4 have the highest uncertainty due to allowing an all-depth fishery statewide.

Table 4-66. California Recreational Season Structure Option 4: Projected mortality (mt) in the California Recreational fisheries, non-trawl allocations and harvest guidelines under No Action in 2017 and 2018. Values in parenthesis indicate the bag limits other than status quo under consideration and resulting projected mortality.

Stock	Projected Mortality	California Recreational HG	Non-Trawl Allocation a/
BOCACCIO (4)	173.3 (80.7)	411.6/385.9	596.0/558.8
Canary Rockfish (1)	35.6 (45.2)	380.1/351.4	780.6/721.7
COWCOD	1.2		2.6
YELLOWEYE ROCKFISH	3.3	3.9	12.1
Black Rockfish (5)	135.9		
Blue Rockfish	64.1	305/311	
Cabazon	13.5		
California Scorpionfish	96.7		
Greenlings	4.1		
Lingcod N. of 40°10' N. lat. (2)b/	35.2 (27.7)		1342.5/1557.8
Lingcod S. of 40°10' N. lat. (2)	287.9 (241.1)		515.3/624.8
Widow Rockfish	19.5		169.2/161.2
Nearshore Rockfish N. of 40°10' N. lat.	5.0		
Nearshore Rockfish S. of 40°10' N. lat.	159.4		

a/ Includes non-nearshore, nearshore, and recreational.

b/ Only includes the area between 42° N. lat. and 40°10' N. lat., while the non-trawl allocation is applicable for the entire area north of 40°10' N. lat.

Projected Petrale Sole Mortality

Currently, petrale sole is allowed to be retained within the groundfish season structure with no size or bag limit. WCGOP total mortality reports indicate mortality of petrale sole has been minimal in the recreational fishery (Table 4-67). While it is likely that some increased effort may be realized by exempting petrale sole from the groundfish season structure, it cannot be quantified. However, if mortality in the California recreational sector were to increase 5 times, the highest mortality in recent years (1.1 mt in 2013), the resulting 5.5 mt, combined with the highest mortality in the remaining non-trawl sectors (2.1 mt in 2013), could be accommodated within the non-trawl allocation (144.8 mt and 138.6 mt in 2017 and 2018, respectively). If inseason tracking indicates that mortality is tracking higher than expected, several actions can be taken, including closing the fishery.

Table 4-67. Total mortality of petrale sole in the California recreational fishery, 2011-2014 from WCGOP Total Mortality Report.

Year	Mortality (mt)
2011	0.5
2012	0.7
2013	1.1
2014	0.9

4.1.2 Alternative 1

Table 4-68 through Table 4-71 contain the harvest specifications, off-the-top deductions, and allocations analyzed under Alternative 1. Notable changes from No Action include higher ACLs for darkblotched and widow rockfish along with lower ACLs for canary rockfish, black rockfish in California, and California scorpionfish. A description of the HCR used to calculate the ACLs can be found in Section 2.1.1. A description of the calculations for the off-the-top deductions can be found in Section 4.1.1.1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-72.

Table 4-68. Alternative 1. 2017 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other ACL values are the same as under No Action.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8	11,705.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	305	18.0		-	-	287.0
Black (OR)	Oregon	527			-	0.6	526.4
Black (CA)	California	319					319.0
BOCACCIO	S of 40°10' N. lat.	790			4.6	0.8	784.6
Cabazon (OR)	46°16' to 42° N. lat.	47			-		47.0
Cabazon (CA)	S of 42° N. lat.	150			-	0.3	149.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	857	35.0		7.2	1.2	813.6
Chilipepper	S of 40°10' N. lat.	2,607			10.9	5.0	2,591.1
COWCOD	S of 40°10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	641	0.2		2.5	24.5	613.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0	9,751.2
Lingcod	N of 40°10° N. lat.	3,333	250.0		11.7	16.0	3,055.3
Lingcod	S of 40°10° N. lat.	1,251			1.1	6.9	1,243.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34°27' N. lat.	2,894	30.0		13.5	3.3	2,847.2
Longspine thornyhead	S of 34°27' N. lat.	914			1.4	1.8	910.8
Nearshore rockfish north	N of 40°10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40°10' N. lat.	1,163			2.7	1.4	1,158.9
Shelf rockfish north	N of 40°10' N. lat.	2,049	30.0		24.8	26.0	1,968.2
Shelf rockfish south	S of 40°10' N. lat.	1,623			8.6	8.6	1,605.8
Slope rockfish north	N of 40°10' N. lat.	1,755	36.0		9.5	18.6	1,690.9
Slope rockfish south	S of 40°10' N. lat.	707			2.0	17.2	687.8
Other fish	Coastwide	474					474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0	8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2	2,895.1
POP	N of 40°10' N. lat.	171	9.2		5.2	10.0	146.6
Sablefish	N of 36° N. lat.	6,041			See Table 4-5		
Sablefish	S of 36° N. lat.	1,075			3.0	2.0	1,070.0
Shortbelly	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34°27' N. lat.	1,713	50.0		7.2	1.8	1,654.0
Shortspine thornyhead	S of 34°27' N. lat.	906			1.0	41.3	863.7
Spiny dogfish	Coastwide	2,094	275.0		12.5	49.5	1,757.0
Splitnose	S of 40°10' N. lat.	1,760			9.0	0.2	1,750.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	13,508	200.0		8.2	0.5	13,299.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40°10' N. lat.	6,196	1,000.0		16.6	3.4	5,176.1

Table 4-69. Alternative 1. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt). All other values are the same as under No Action.

Species	Area	Fishery HG or ACT	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46°16'	287.0	None				
Black (OR)	46°16' to 42° N. lat.	526.4	None				
Black (CA)	S of 42° N. lat.	319.0	None				
BOCACCIO	S of 40°10' N. lat.	784.6	Biennial	N/A	188.6	N/A	596.3
Cabezon (OR)	46°16' to 42° N. lat.	47.0	None				
Cabezon (CA)	S of 42° N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	813.6	Biennial	N/A	433.5	N/A	380.1
Chilipepper	S of 40°10' N. lat.	2,591.1	Amendment 21	75%	1,943.3	25%	647.8
COWCOD b/	S of 40°10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	613.9	Amendment 21	95%	583.2	5%	30.7
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40°10° N. lat.	3,055.3	Amendment 21	45%	1,374.9	55%	1,680.4
Lingcod	S of 40°10° N. lat.	1,243.0	Amendment 21	45%	559.4	55%	683.7
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34°27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34°27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40°10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40°10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40°10' N. lat.	1,968.2	Biennial	60.2%	1,184.9	39.8%	783.3
Shelf rockfish south	S of 40°10' N. lat.	1,605.8	Biennial	12.2%	195.9	87.8%	1,409.9
Slope rockfish north	N of 40°10' N. lat.	1,690.9	Amendment 21	81%	1,369.6	19%	321.3
Slope rockfish south	S of 40°10' N. lat.	687.8	Amendment 21	63%	433.3	37%	254.5
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40°10' N. lat.	146.6	Amendment 21	95%	139.3	5%	7.3
Sablefish	N of 36° N. lat.		See Table 4-5				
Sablefish	S of 36° N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34°27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34°27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,757.0	None				
Splitnose	S of 40°10' N. lat.	1,750.8	Amendment 21	95%	1,663.3	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	13,299.3	Amendment 21	91%	12,102.4	9%	1,196.9
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40°10' N. lat.	5,176.1	Amendment 21	88%	4,554.9	12%	621.1

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-70. Alternative 1. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other values are the same as under No Action.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8	11,644.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	301	18.0		-	-	283.0
Black (OR)	Oregon	520			-	0.6	519.4
Black (CA)	California	319					319.0
Blackgill	S of 40°10' N. lat.	123			0.5	0.1	122.4
BOCACCIO	S of 40°10' N. lat.	741			4.6	0.8	735.6
Cabezon (OR)	46°16' to 42° N. lat.	47			-		47.0
Cabezon (CA)	S of 42° N. lat.	149			-	0.3	148.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	763	35.0		7.2	1.2	719.6
Chilipepper	S of 40°10' N. lat.	2,507			10.9	5.0	2,491.1
COWCOD	S of 40°10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	653	0.2		2.5	24.5	625.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0	7,324.2
Lingcod	N of 40°10° N. lat.	3,110	250.0		11.7	16.0	2,832.3
Lingcod	S of 40°10° N. lat.	1,144			1.1	6.9	1,136.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34°27' N. lat.	2,747	30.0		13.5	3.3	2,700.2
Longspine thornyhead	S of 34°27' N. lat.	867			1.4	1.8	863.8
Nearshore rockfish north	N of 40°10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40°10' N. lat.	1,179			2.7	1.4	1,174.9
Shelf rockfish north	N of 40°10' N. lat.	2,047	30.0		24.8	26.0	1,966.2
Shelf rockfish south	S of 40°10' N. lat.	1,624			8.6	8.6	1,606.8
Slope rockfish north	N of 40°10' N. lat.	1,754	36.0		9.5	18.6	1,689.9
Slope rockfish south	S of 40°10' N. lat.	586			2.0	17.2	566.8
Other fish	Coastwide	441					441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0	7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting a/	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,013	220.0		17.7	3.2	2,772.1
POP	N of 40°10' N. lat.	176	9.2		5.2	10.0	151.6
Sablefish	N of 36° N. lat.	6,299			See Table 4-5		
Sablefish	S of 36° N. lat.	1,120			3.0	2.0	1,115.0
Shortbelly	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34°27' N. lat.	1,698	50.0		7.2	1.8	1,639.0
Shortspine thornyhead	S of 34°27' N. lat.	898			1.0	41.3	855.7
Spiny dogfish	Coastwide	2,083	275.0		12.5	49.5	1,746.0
Splitnose	S of 40°10' N. lat.	1,761			9.0	0.2	1,751.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	12,655	200.0		8.2	0.5	12,446.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40°10' N. lat.	6,002	1,000.0		16.6	3.4	4,982.1

^{a/} Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-71. Alternative 1. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt). All other values are the same as under No Action.

Species	Area	Fishery HG or ACT	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46°16'	283.0	None				
Black (OR)	46°16' to 42° N. lat.	519.4	None				
Black (CA)	S of 42° N. lat.	319.0	None				
Blackgill	S of 40°10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACIO	S of 40°10' N. lat.	735.6	Biennial	N/A	176.8	N/A	558.8
Cabezon (OR)	46°16' to 42° N. lat.	47.0	None				
Cabezon (CA)	S of 42° N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	719.6	Biennial	N/A	383.4	N/A	336.2
Chilipepper	S of 40°10' N. lat.	2,491.1	Amendment 21	75%	1,868.3	25%	622.8
COWCOD b/	S of 40°10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	625.9	Amendment 21	95%	594.6	5%	31.3
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40°10' N. lat.	2,832.3	Amendment 21	45%	1,274.5	55%	1,557.8
Lingcod	S of 40°10' N. lat.	1,136.0	Amendment 21	45%	511.2	55%	624.8
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34°27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34°27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40°10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40°10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40°10' N. lat.	1,966.2	Biennial	60.2%	1,183.7	39.8%	782.5
Shelf rockfish south	S of 40°10' N. lat.	1,606.8	Biennial	12.2%	196.0	87.8%	1,410.8
Slope rockfish north	N of 40°10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40°10' N. lat.	566.8		91%	515.8	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,663.5	5%	138.6
POP	N of 40°10' N. lat.	151.6	Amendment 21	95%	144.0	5%	7.6
Sablefish	N of 36° N. lat.		See Table 4-5				
Sablefish	S of 36° N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34°27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34°27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,746.0	None				
Splitnose	S of 40°10' N. lat.	1,751.8	Amendment 21	95%	1,664.2	5%	87.6
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	12,446.3	Amendment 21	91%	11,326.1	9%	1,120.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40°10' N. lat.	4,982.1	Amendment 21	88%	4,384.2	12%	597.8

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore the 2015 values were used.

Table 4-72. Alternative 1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFP c/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	188.6	57.3	1.4	0.2	359.9	107.6	139.3	45.0	1.1	0.1
--SB Trawl	188.6	57.3	1.4	0.2	341.0	98.7	122.0	39.1	1.1	0.1
--At-sea whiting MS					7.8	5.2	7.2	2.5		
--At-sea whiting CP					11.0	3.7	10.2	3.4		
Non-Trawl Allocation	596.0	169.8	2.6	2.2	18.9	7.2	7.3	0.5	12.9	12.1
Non-Nearshore	182.1	0.0		0.0		7.0		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.3	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	411.6	169.3		2.2		--		--	3.9	3.7
TOTAL	790.0	232.5	6.0	4.4	406.0	142.0	171.0	69.9	20.0	18.2
2017 Harvest Specification	790	790	10.0	10.0	406	406	171	171	20	20
Difference	0.0	557.5	4.0	5.6	0.0	264.0	0.0	101.1	0.0	1.8
Percent of ACL	100.0%	29.4%	60.0%	43.7%	100.0%	35.0%	100.0%	40.9%	100.0%	91.1%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFP c/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	176.8	53.7	1.4	0.2	372.3	107.6	144.0	45.2	1.1	0.0
--SB Trawl	176.8	53.7	1.4	0.2	353.0	98.7	127.0	39.3	1.1	0.0
--At-sea whiting MS					8.0	5.2	7.2	2.5		
--At-sea whiting CP					11.4	3.7	10.2	3.4		
Non-Trawl Allocation	558.8	169.8	2.6	2.2	19.6	7.5	7.6	0.5	12.9	12.1
Non-Nearshore	170.7	0.0		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.2	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	385.9	169.3		2.2		--		--	3.9	3.7
TOTAL	741.0	228.9	6.0	4.4	419.1	142.3	176.0	70.1	20.0	18.1
2017 Harvest Specification	741	741	10.0	10.0	419	419	176	176	20	20
Difference	0.0	512.1	4.0	5.6	-0.1	276.7	0.0	105.9	0.0	1.9
Percent of ACL	100.0%	30.9%	60.0%	43.7%	100.0%	34.0%	100.0%	39.8%	100.0%	90.7%
Key			= not applicable							
		--	= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

4.1.2.1 Harvest Guidelines and Other Allocations

The canary rockfish recreational HGs as well as the nearshore and non-nearshore shares are lower under Alternative 1 (Table 4-73), compared to No Action (Table 4-7), coincident with the decrease in the ACL. The HGs described under No Action (Section 0) for blackgill rockfish in 2017, blue rockfish south of 42° N. latitude, California scorpionfish south of 34°27' N. latitude, and Minor Nearshore Rockfish north of 40°10' N. latitude would also apply under Alternative 1.

Table 4-73. Alternative 1 Allocations, HGs, and shares of Canary Rockfish.

Sector	2017	2018
Fishery Harvest Guideline	813.6	719.6
Trawl Allocation	433.5	383.4
<i>Shorebased IFQ</i>	329.3	291.2
<i>Catcher Processor</i>	60.8	53.8
<i>Mothership</i>	43.3	38.3
Non-Trawl Allocation	380.1	336.2
<i>Non-Nearshore</i>	28.9	25.6
<i>Nearshore Fixed Gear</i>	51.0	45.1
<i>Washington Recreational a/</i>	25.9	22.9
<i>Oregon Recreational a/</i>	89.1	78.8
<i>California Recreational a/</i>	185.1	163.7

a/ Values represent HGs which may be adjusted within the non-trawl allocation.

4.1.2.2 Overview of Management Measures

The following bullet points summarize management measure changes by sector under Alternative 1. A more detailed discussion of management measures by sector follows. New measures, discussed in Chapter 3 and analyzed in Appendix B, could also be implemented.

- Trawl Sectors: Notable changes include higher trawl allocations for darkblotched and widow rockfish and lower allocations for canary rockfish compared to No Action. Accordingly, the shorebased IFQ and allocations to the at-sea whiting co-ops would be higher for darkblotched and widow rockfishes and lower for canary rockfish, compared to No Action.
- Non-Trawl Sector: Notable changes include higher non-trawl allocations for darkblotched and widow rockfishes and lower allocations for canary rockfish, compared to No Action.
 - The non-nearshore and nearshore shares of canary rockfish would decrease, compared to No Action; however, the RCA and trip limit options described under No Action would still apply under Alternative 1.
 - Tribal fisheries would operate under the same management measures as No Action.
 - Washington, Oregon, and California recreational fisheries would have lower canary rockfish HGs under Alternative 1; however the fishery would still operate under the same management measures described under the No Action Alternative.
 - The black rockfish ACL in California is lower under Alternative 1, than under No Action; however management measures remain the same.

4.1.2.3 Shorebased IFQ – Alternative 1

The trawl RCA structure under Alternative 1 is the same as No Action (Tables 4-4 and 4-5). Allocations and projections differ between Alternative 1 and No Action only for three species; canary, darkblotched, and widow rockfishes. The canary rockfish allocation under Alternative 1 is half of the No Action alternative, and so is the projection, since canary rockfish catch has co-varied responsively with changes in the allocation, both under IFQ and trip limit management. The darkblotched rockfish allocation under Alternative 1 is more than 60 percent higher than under No Action; the projection is only slightly higher under Alternative 1, since darkblotched rockfish catch has not shown appreciable responsiveness to changes in the allocation, under IFQ. Both the allocation and the projected catch are more than eight times higher for widow rockfish under Alternative 1 than under No Action, since catch of widow rockfish has been highly responsive to changes in the allocation in both IFQ and historical data.

Table 4-74. Alternative 1 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 1 for 2017 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 1 2017		No Action 2017	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,302.2	11,050.6	2,302.2	11,050.6
BOCACCI	South of 40°10' N. lat.	57.3	188.6	57.3	188.6
Canary rockfish	Coastwide	262.3	329.3	538.6	676.1
Chilipepper	South of 40°10' N. lat.	353.8	1,943.3	353.8	1,943.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	98.7	552.7	97.6	341.1
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	240.7	9,258.6	240.7	9,258.6
Lingcod	North of 40°10' N. lat.	315.4	1,359.9	315.4	1,359.9
Lingcod	South of 40°10' N. lat.		559.4		559.4
Longspine thornyheads	North of 34°27' N. lat.	942.7	2,699.8	942.7	2,699.8
Minor Shelf Rockfish	South of 40°10' N. lat.	66.5	1,149.9	66.5	1,149.9
Minor Shelf Rockfish	North of 40°10' N. lat.	15.5	195.9	15.5	195.9
Minor Slope Rockfish	North of 40°10' N. lat.	260.6	1,269.6	260.6	1,269.6
Minor Slope Rockfish	South of 40°10' N. lat.	119.5	433.3	119.5	433.3
Other Flatfish	Coastwide	1,549.2	7,455.4	1,549.2	7,455.4
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut c/	North of 40°10' N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.1	121.9	39.1	121.9
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
Petrals	Coastwide	2,620.2	2,745.3	2,620.2	2,745.3
Sablefish	North of 36° N. lat.	2,660.0	2,790.1	2,660.0	2,790.1
Sablefish	South of 36° N. lat.	143.9	449.4	143.9	449.4
Shortspine thornyheads	North of 34°27' N.	695.0	1,551.3	695.0	1,551.3
Shortspine thornyheads	South of 34°27' N.	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,663.3	64.1	1,663.3
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	9,178.0	11,400.4	1,078.8	1,340.1
YELLOW EYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,401.5	4,254.9	1,401.5	4,254.9

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch.

b/ As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

c/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-75. Alternative 1 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 1 for 2018 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 1 2018		No Action 2018	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,299.8	10,992.6	2,299.8	10,992.6
BOCACCI	South of 40°10' N. lat.	53.7	176.8	53.7	176.8
CANARY ROCKFISH	Coastwide	232.0	291.2	498.0	625.1
Chilipepper	South of 40°10' N. lat.	353.8	1,868.3	353.8	1,868.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	98.7	563.5	97.9	352.8
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	220.2	6,953.0	220.2	6,953.0
Lingcod	North of 40°10' N. lat.	291.0	1,259.5	291.0	1,259.5
Lingcod	South of 40°10' N. lat.		511.2		511.2
Longspine thornyheads	North of 34°27' N. lat.	939.5	2,560.2	939.5	2,560.2
Minor Shelf Rockfish	South of 40°10' N. lat.	66.4	1,148.7	66.4	1,148.7
Minor Shelf Rockfish	North of 40°10' N. lat.	15.5	196.0	15.5	196.0
Minor Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	260.5	1,268.8
Minor Slope Rockfish	South of 40°10' N. lat.	101.5	357.1	101.5	357.1
Other Flatfish	Coastwide	1,319.3	6,349.3	1,319.3	6,349.3
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut c/	North of 40°10' N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.3	126.6	39.3	126.6
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
PETRALE SOLE	Coastwide	2,508.7	2,628.5	2,508.7	2,628.5
Sablefish	North of 36° N. lat.	2,776.3	2,912.1	2,776.3	2,912.1
Sablefish	South of 36° N. lat.	149.9	468.3	149.9	468.3
Shortspine thornyheads	North of 34°27' N.	694.5	1,537.0	694.5	1,537.0
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,664.2	64.1	1,664.2
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	8,589.3	10,669.2	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,347.9	4,084.2	1,347.9	4,084.2

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch.

b/ As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

c/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

Big Skate

Under Alternative 1, big skate would be reclassified from an ecosystem component species to “in the fishery” with species-specific harvest specifications after new information in 2015 showed that big skate was being targeted within the shorebased IFQ fishery. The Council recommended that a species-specific sorting requirement be implemented for all fisheries, and that trip limits be used in the shorebased IFQ fishery only. Trip limits for the shorebased IFQ fishery under Alternative 1 for both 2017-2018 are found in Table 4-8. Trip limits may be adjusted inseason.

Table 4-8: Big skate trip limits coastwide for shorebased IFQ fishery for 2017-2018.

JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
5,000	25,000	30,000	35,000	10,000	5,000

4.1.2.4 At-Sea Whiting Co-ops – Alternative 1

The at-sea whiting co-ops would operate under the same management measures described under No Action with a few modifications. The 2017-2018 allocations for the catcher-processor and mothership sectors under Alternative 1 are provided in Table 4-76 and compared to No Action. Notable differences from No Action include lower allocations for canary and higher allocations for widow and darkblotched rockfish. Table 4-77 and Table 4-78 shows the probable catches using the bootstrap simulation under Alternative 1 for canary, darkblotched, POP, Pacific whiting, and widow rockfish. The projections under the bycatch rate approach are the same as under No Action since the whiting TAC remains the same (Table 4-17). At-sea whiting set-asides would be the same under Alternative 1 as under No Action (Table 4-20).

Table 4-76. Alternative 1 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 1. The No Action allocations are provided (right panel) for reference.

Stock	Area	Alternative 1				No Action			
		2017		2018		2017		2018	
		CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)
Canary rockfish	Coastwide	60.8	43.3	53.8	38.3	124.9	89.0	115.5	82.3
DARKBLOTCHED	Coastwide	17.8	12.6	18.2	12.8	11	7.8	11.4	8.0
POP	N of 40°10' N. lat.	10.2	7.2	10.2	7.2	10.2	10.2	7.2	7.2
Pacific whiting a/	Coastwide	90,673	64,004	90,673	64,004	90,673	64,004	90,673	64,004
Widow rockfish	Coastwide	411.5	290.5	385.1	271.8	170	170	120	120

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis, therefore the 2015 values were used.

Table 4-77: Alternative 1- At-Sea- Catcher Processor. Projections for the CP sector under Alternative 1 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. Alternative 1 allocations for 2017 are provided on the right for reference.

Stock	CP All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	90,673	22,478	38,579	63,549	90,673	90,673	90,673	90,673	90,673	90,673	90,673
DARKBLOTCHED	17.8	0.3	1.3	1.7	2.6	4.9	7.1	9.4	12	16.7	19.7
POP	10.2	0.1	0.2	0.3	1	4.7	8.6	10.4	10.9	12.4	14.4
Widow rockfish	411.5	3.5	5.7	8.4	14.4	31.9	67	97.3	119	317.1	486.7
Canary rockfish	60.8	0.1	0.1	0.1	0.2	0.4	0.6	1.2	2.3	4.3	7.3

Table 4-78: Alternative 1- At-Sea- Mothership. Projections for the MS sector under Alternative 1 for 2017-2018 using the bootstrap method sampling hauls from 2000-2015. Alternative 1 allocations for 2017 are provided on the right for reference. Bolded text indicates values that are higher than the allocations.

Stock	MS All. (mt)	Percentage of Simulated Seasons									
		1%	5%	10%	25%	50%	75%	90%	95%	99%	99.99%
Whiting	64,004	14,713	27,864	64,004	64,004	64,004	64,004	64,004	64,004	64,004	64,004
DARKBLOTCHED	12.6	0.2	0.5	1	2.2	4.5	6.3	8.9	9.7	12	15.3
POP	7.2	0.1	0.1	0.3	0.9	1.9	3.6	5.6	7.3	8.2	9.7
Widow rockfish	290.5	1.6	11.9	15.6	24.6	46.8	70.8	103	161.5	212.5	268.1
Canary rockfish	43.3	0.1	0.1	0.1	0.3	0.7	1.1	2.1	2.4	16.1	32

4.1.2.5 Limited Entry and Open Access Fixed Gear– Alternative 1

Non-Nearshore

Alternative 1 is similar to the No Action Alternative, except that the non-trawl allocations for darkblotched and widow rockfish are higher while canary rockfish is lower (Table 4-69 and Table 4-71). Under Alternative 1, the nearshore and non-nearshore trip limits and RCA structure described under No Action would apply. While the nearshore and non-nearshore fishery shares of canary rockfish decrease under Alternative 1 for 2017-2018 (Table 4-73) compared to No Action (Table 4-7), the canary trip limits do not change because they were developed only to allow for retention of previously discarded landings, not to encourage targeting.

Nearshore – Alternative 1

There are three changes for the nearshore fishery under Alternative 1, compared to No Action. The canary rockfish ACL, non-trawl allocation, and nearshore share is lower under Alternative 1 (Table 4-68 and Table 4-70), compared to No Action (Table 4-2 and Table 4-4). Additionally, the California black rockfish and California scorpionfish south of 34°27' N. latitude ACLs, and non-trawl allocations are lower under Alternative 1, compared to No Action. However, the same management measures and trip limit options described under No Action would apply under Alternative 1 since projected mortality is well below the nearshore share (canary rockfish, Table 4-47; black rockfish CA, Table 4-50; and California scorpionfish south of 34°27' N. latitude Table 4-52).

4.1.2.6 Tribal Fisheries – Alternative 1

Tribal fisheries would operate under the HGs and allocations displayed in Table 4-2 and Table 4-4. Tribal fisheries would be managed using the same measures described under No Action.

4.1.2.7 Washington Recreational – Alternative 1

Alternative 1 is similar to the No Action Alternative, except that the Washington recreational HG for canary rockfish decreases to 25.9 mt in 2017 and 22.9 mt in 2018 (Table 4-79) compared to No Action (Table 4-54). Under Alternative 1, the Washington recreational season structure (Status Quo Table 4-55 and Option 1 Table 4-56) and sub-bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-57).

Table 4-79. Alternative 1: Washington recreational HGs for 2017 and 2018.

Stock	2017	2018
Canary Rockfish	25.9	22.9
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish	13.1	13.1

4.1.2.8 Oregon Recreational – Alternative 1

Alternative 1 is similar to the No Action Alternative, except that the Oregon recreational HG for canary rockfish decreases to 89.1 mt in 2017 and 78.8 mt in 2018 (Table 4-80) compared to No Action (Table 4-58). Under Alternative 1, the Oregon recreational season structure Figure 4-5 and bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-60).

Table 4-80. Oregon recreational Federal HGs (in mt) and state quotas under the Alternative 1 for 2017-2018.

Stock	HG and State Quotas a/	
	2017	2018
Canary Rockfish	89.1	78.8
YELLOWEYE ROCKFISH	3.0	3.0
Black Rockfish OR ^{b/}	400.1	394.7
Greenlings ^{c/}	41.1	34.9
Nearshore Rockfish N. of 40°10' N. lat. ^{d/}	44.5	44.5

a/ Federal HG are established for canary and yelloweye rockfish only. The state process in Oregon establishes quotas for black rockfish, blue rockfish, other Nearshore Rockfish, and greenlings (all species). The state quotas, which are yet to be determined are not intended to be implemented in Federal regulation, they are only provided as information.

b/ The values shown are the presumptive share, based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations

c/ Includes kelp and other greenlings. The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.

d/ Includes blue rockfish. The state of Oregon has a Federal HG for Nearshore Rockfish North of 40°10' N. Lat. of 60.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive share, based on 2015 recreational and commercial sharing percentages in Oregon State Regulations.

4.1.2.9 California Recreational – Alternative 1

Alternative 1 is similar to the No Action Alternative, except that the California recreational HG for canary rockfish decreases to 185.1 mt in 2017 and 163.7 mt in 2018 and the allowable limit for black rockfish is reduced to 319 mt when compared to No Action. The California scorpionfish HG remains 111 mt and as such the decrease in the ACL under Alternative 1, compared to No Action, does not result in changes to management measures.

Under Alternative 1, the California recreational season structure options are the same as No Action (Option 1 Figure 4-8; Option 2 Figure 4-9; Option 3 Figure 4-10; Option 4 Figure 4-11). Projected mortality for most species is similar to No Action, except for black rockfish (Option 1 Table 4-63; Option 2 Table 4-64; Option 3 Table 4-65; Option 4 Table 4-66).

Given the reduced allowable limits for black rockfish, the sub-bag limit would need to be further reduced statewide to two fish to accommodate season structure Option 1 (Figure 4-8; 123.2 mt) and season structure Option 2 (Figure 4-9; 125.1 mt). A three fish sub-bag limit could be accommodated statewide under season structure Option 3 (Figure 4-10; 202.2 mt). A five fish sub-bag limit could be accommodated statewide under season structure Option 4 (Figure 4-11; 135.9 mt).

4.1.3 Alternative 2

Table 4-81 through Table 4-84 contain harvest specifications, off-the-top deductions, and allocations analyzed under Alternative 2. Notable changes from No Action include higher ACLs for darkblotched and widow rockfishes along with lower ACLs for canary rockfish, black rockfish in California, and California scorpionfish. A description of the HCR used to calculate the ACLs can be found in Section 2.1.3. A description of the calculations for the off-the-top deductions can be found in Section 4.1.1.1. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018 can be found in Table 4-85.

Table 4-81. Alternative 2. 2017 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other ACL values are the same as under No Action.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,804	2,041.0		16.4	40.8	11,705.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	305	18.0		-	-	287.0
Black (OR)	Oregon	527			-	0.6	526.4
Black (CA)	California	319					319.0
BOCACCIO	S of 40°10' N. lat.	790			4.6	0.8	784.6
Cabezon (OR)	46°16' to 42° N. lat.	47			-		47.0
Cabezon (CA)	S of 42° N. lat.	150			-	0.3	149.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	566	35.0		7.2	1.2	522.6
Chilipepper	S of 40°10' N. lat.	2,607			10.9	5.0	2,591.1
COWCOD	S of 40°10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	641	0.2		2.5	24.5	613.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	9,964	200.0		5.8	7.0	9,751.2
Lingcod	N of 40°10' N. lat.	3,333	250.0		11.7	16.0	3,055.3
Lingcod	S of 40°10' N. lat.	1,251			1.1	6.9	1,243.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34°27' N. lat.	2,894	30.0		13.5	3.3	2,847.2
Longspine thornyhead	S of 34°27' N. lat.	914			1.4	1.8	910.8
Nearshore rockfish north	N of 40°10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40°10' N. lat.	1,163			2.7	1.4	1,158.9
Shelf rockfish north	N of 40°10' N. lat.	2,049	30.0		24.8	26.0	1,968.2
Shelf rockfish south	S of 40°10' N. lat.	1,623			8.6	8.6	1,605.8
Slope rockfish north	N of 40°10' N. lat.	1,755	36.0		9.5	18.6	1,690.9
Slope rockfish south	S of 40°10' N. lat.	707			2.0	17.2	687.8
Other fish	Coastwide	474					474.0
Other flatfish	Coastwide	8,510	60.0		19.0	125.0	8,306.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale sole	Coastwide	3,136	220.0		17.7	3.2	2,895.1
POP	N of 40°10' N. lat.	171	9.2		5.2	10.0	146.6
Sablefish	N of 36° N. lat.	6,041			Table 4-5		
Sablefish	S of 36° N. lat.	1,075			3.0	2.0	1,070.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34°27' N. lat.	1,713	50.0		7.2	1.8	1,654.0
Shortspine thornyhead	S of 34°27' N. lat.	906			1.0	41.3	863.7
Spiny dogfish	Coastwide	2,094	275.0		12.5	49.5	1,757.0
Splitnose rockfish	S of 40°10' N. lat.	1,760			9.0	0.2	1,750.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	13,508	200.0		8.2	0.5	13,299.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40°10' N. lat.	6,196	1,000.0		16.6	3.4	5,176.1

Table 4-82. Alternative 2. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2017 (in mt). All other values are the same as under No Action.

Species	Area	Fishery HG or ACT	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,705.9	Amendment 21	95%	11,120.6	5%	585.3
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46°16'	287.0	None				
Black (OR)	46°16' to 42° N. lat.	526.4	None				
Black (CA)	S of 42° N. lat.	319.0	None				
BOCACCI	S of 40°10' N. lat.	784.6	Biennial	N/A	188.6	N/A	596.3
Cabezon (OR)	46°16' to 42° N. lat.	47.0	None				
Cabezon (CA)	S of 42° N. lat.	149.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	522.6	Biennial	N/A	278.4	N/A	244.2
Chilipepper	S of 40°10' N. lat.	2,591.1	Amendment 21	75%	1,943.3	25%	647.8
COWCOD b/	S of 40°10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	613.9	Amendment 21	95%	583.2	5%	30.7
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	9,751.2	Amendment 21	95%	9,263.6	5%	487.6
Lingcod	N of 40°10' N. lat.	3,055.3	Amendment 21	45%	1,374.9	55%	1,680.4
Lingcod	S of 40°10' N. lat.	1,243.0	Amendment 21	45%	559.4	55%	683.7
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34°27' N. lat.	2,847.2	Amendment 21	95%	2,704.8	5%	142.4
Longspine thornyhead	S of 34°27' N. lat.	910.8	None				
Nearshore rockfish north	N of 40°10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40°10' N. lat.	1,158.9	None				
Shelf rockfish north	N of 40°10' N. lat.	1,968.2	Biennial	60.2%	1,184.9	39.8%	783.3
Shelf rockfish south	S of 40°10' N. lat.	1,605.8	Biennial	12.2%	195.9	87.8%	1,409.9
Slope rockfish north	N of 40°10' N. lat.	1,690.9	Amendment 21	81%	1,369.6	19%	321.3
Slope rockfish south	S of 40°10' N. lat.	687.8	Amendment 21	63%	433.3	37%	254.5
Other fish	Coastwide	474.0	None				
Other flatfish	Coastwide	8,306.0	Amendment 21	90%	7,475.4	10%	830.6
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,895.1	Amendment 21	95%	2,750.3	5%	144.8
POP	N of 40°10' N. lat.	146.6	Amendment 21	95%	139.3	5%	7.3
Sablefish	N of 36° N. lat.		Table 4-5				
Sablefish	S of 36° N. lat.	1,070.0	Amendment 21	42%	449.4	58%	620.6
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34°27' N. lat.	1,654.0	Amendment 21	95%	1,571.3	5%	82.7
Shortspine thornyhead	S of 34°27' N. lat.	863.7	Amendment 21	NA	50.0	NA	813.7
Spiny dogfish	Coastwide	1,757.0	None				
Splitnose rockfish	S of 40°10' N. lat.	1,750.8	Amendment 21	95%	1,663.3	5%	87.5
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	13,299.3	Amendment 21	91%	12,102.4	9%	1,196.9
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40°10' N. lat.	5,176.1	Amendment 21	88%	4,554.9	12%	621.1

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-83. Alternative 2. 2018 ACLs and estimates of tribal, EFP, research, and incidental open access (OA) mortality (in mt), used to calculate the fishery harvest guideline (HG). All other values are the same as under No Action.

Species	Area	ACL	Tribal	EFP	Research	OA	Fishery HG
Arrowtooth flounder	Coastwide	13,743	2,041.0		16.4	40.8	11,644.9
Big skate	Coastwide	494	15.0		4.0	38.4	436.6
Black (WA)	Washington	301	18.0		-	-	283.0
Black (OR)	Oregon	520			-	0.6	519.4
Black (CA)	California	319					319.0
Blackgill	S of 40°10' N. lat.	123			0.5	0.1	122.4
BOCACCIO	S of 40°10' N. lat.	741			4.6	0.8	735.6
Cabezon (OR)	46°16' to 42° N. lat.	47			-		47.0
Cabezon (CA)	S of 42° N. lat.	149			-	0.3	148.7
California scorpionfish	S of 34°27' N. lat.	150			0.2	2.0	147.8
Canary rockfish	Coastwide	504	35.0		7.2	1.2	460.6
Chilipepper	S of 40°10' N. lat.	2,507			10.9	5.0	2,491.1
COWCOD	S of 40°10' N. lat.	10			2.0	0.0	8.0
DARKBLOTCHED	Coastwide	653	0.2		2.5	24.5	625.9
Dover sole	Coastwide	50,000	1,497.0		41.9	54.8	48,406.3
English sole	Coastwide	7,537	200.0		5.8	7.0	7,324.2
Lingcod	N of 40°10° N. lat.	3,110	250.0		11.7	16.0	2,832.3
Lingcod	S of 40°10° N. lat.	1,144			1.1	6.9	1,136.0
Longnose skate	Coastwide	2,000	130.0		13.2	3.8	1,853.0
Longspine thornyhead	N of 34°27' N. lat.	2,747	30.0		13.5	3.3	2,700.2
Longspine thornyhead	S of 34°27' N. lat.	867			1.4	1.8	863.8
Nearshore rockfish north	N of 40°10' N. lat.	105	1.5		-	0.3	103.2
Nearshore rockfish south	S of 40°10' N. lat.	1,179			2.7	1.4	1,174.9
Shelf rockfish north	N of 40°10' N. lat.	2,047	30.0		24.8	26.0	1,966.2
Shelf rockfish south	S of 40°10' N. lat.	1,624			8.6	8.6	1,606.8
Slope rockfish north	N of 40°10' N. lat.	1,754	36.0		9.5	18.6	1,689.9
Slope rockfish south	S of 40°10' N. lat.	586			2.0	17.2	566.8
Other Fish	Coastwide	441					441.0
Other flatfish	Coastwide	7,281	60.0		19.0	125.0	7,077.0
Pacific cod	Coastwide	1,600	500.0		7.0	2.0	1,091.0
Pacific whiting	Coastwide	325,072	56,888.0			1,500.0	266,684.0
Petrale Sole	Coastwide	3,013	220.0		17.7	3.2	2,772.1
POP	N of 40°10' N. lat.	176	9.2		5.2	10.0	151.6
Sablefish	N of 36° N. lat.	6,299			Table 4-5		
Sablefish	S of 36° N. lat.	1,120			3.0	2.0	1,115.0
Shortbelly rockfish	Coastwide	500			2.0	8.9	489.1
Shortspine thornyhead	N of 34°27' N. lat.	1,698	50.0		7.2	1.8	1,639.0
Shortspine thornyhead	S of 34°27' N. lat.	898			1.0	41.3	855.7
Spiny Dogfish	Coastwide	2,083	275.0		12.5	49.5	1,746.0
Splitnose rockfish	S of 40°10' N. lat.	1,761			9.0	0.2	1,751.8
Starry flounder	Coastwide	1,282	2.0			8.3	1,271.7
Widow rockfish	Coastwide	12,655	200.0		8.2	0.5	12,446.3
YELLOWEYE	Coastwide	20	2.3		3.3	0.4	14.0
Yellowtail rockfish	N of 40°10' N. lat.	6,002	1,000.0		16.6	3.4	4,982.1

^{a/} Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore, the 2015 values were used.

Table 4-84. Alternative 2. Stock specific fishery harvest guidelines (HG) or annual catch targets (ACT) and allocations for 2018 (in mt). All other values are the same as under No Action.

Species	Area	Fishery HG or ACT	Allocation Type	Trawl		Non-trawl	
				%	Mt	%	Mt
Arrowtooth flounder	Coastwide	11,644.9	Amendment 21	95%	11,062.6	5%	582.2
Big skate	Coastwide	436.6	Biennial	95%	414.8	5%	21.8
Black (WA)	N of 46°16'	283.0	None				
Black (OR)	46°16' to 42° N. lat.	519.4	None				
Black (CA)	S of 42° N. lat.	319.0	None				
Blackgill	S of 40°10' N. lat.	122.4	Amendment 26	41%	50.2	59%	72.2
BOCACCIO	S of 40°10' N. lat.	735.6	Biennial	N/A	176.8	N/A	558.8
Cabezon (OR)	46°16' to 42° N. lat.	47.0	None				
Cabezon (CA)	S of 42° N. lat.	148.7	None				
California scorpionfish a/	S of 34°27' N. lat.	111.0	None				
Canary rockfish	Coastwide	460.6	Biennial	N/A	245.4	N/A	215.2
Chilipepper	S of 40°10' N. lat.	2,491.1	Amendment 21	75%	1,868.3	25%	622.8
COWCOD b/	S of 40°10' N. lat.	4.0	Biennial	N/A	1.4	N/A	2.6
DARKBLOTCHED	Coastwide	625.9	Amendment 21	95%	594.6	5%	31.3
Dover sole	Coastwide	48,406.3	Amendment 21	95%	45,986.0	5%	2,420.3
English sole	Coastwide	7,324.2	Amendment 21	95%	6,958.0	5%	366.2
Lingcod	N of 40°10' N. lat.	2,832.3	Amendment 21	45%	1,274.5	55%	1,557.8
Lingcod	S of 40°10' N. lat.	1,136.0	Amendment 21	45%	511.2	55%	624.8
Longnose skate	Coastwide	1,853.0	Biennial	90%	1,667.7	10%	185.3
Longspine thornyhead	N of 34°27' N. lat.	2,700.2	Amendment 21	95%	2,565.2	5%	135.0
Longspine thornyhead	S of 34°27' N. lat.	863.8	None				
Nearshore rockfish north	N of 40°10' N. lat.	103.2	None				
Nearshore rockfish south	S of 40°10' N. lat.	1,174.9	None				
Shelf rockfish north	N of 40°10' N. lat.	1,966.2	Biennial	60.2%	1,183.7	39.8%	782.5
Shelf rockfish south	S of 40°10' N. lat.	1,606.8	Biennial	12.2%	196.0	87.8%	1,410.8
Slope rockfish north	N of 40°10' N. lat.	1,689.9	Amendment 21	81%	1,368.8	19%	321.1
Slope rockfish south	S of 40°10' N. lat.	566.8		91%	515.8	9%	51.0
Other fish	Coastwide	441.0	None				
Other flatfish	Coastwide	7,077.0	Amendment 21	90%	6,369.3	10%	707.7
Pacific cod	Coastwide	1,091.0	Amendment 21	95%	1,036.4	5%	54.5
Pacific whiting c/	Coastwide	266,684.0	Amendment 21	100%	266,684.0	0%	0.0
Petrale sole	Coastwide	2,772.1	Amendment 21	95%	2,663.5	5%	138.6
POP	N of 40°10' N. lat.	151.6	Amendment 21	95%	144.0	5%	7.6
Sablefish	N of 36° N. lat.	0.0	Table 4-5				
Sablefish	S of 36° N. lat.	1,115.0	Amendment 21	42%	468.3	58%	646.7
Shortbelly rockfish	Coastwide	489.1	None				0.0
Shortspine thornyhead	N of 34°27' N. lat.	1,639.0	Amendment 21	95%	1,557.0	5%	81.9
Shortspine thornyhead	S of 34°27' N. lat.	855.7	Amendment 21	NA	50.0	NA	805.7
Spiny dogfish	Coastwide	1,746.0	None				
Splitnose rockfish	S of 40°10' N. lat.	1,751.8	Amendment 21	95%	1,664.2	5%	87.6
Starry flounder	Coastwide	1,271.7	Amendment 21	50%	635.9	50%	635.9
Widow rockfish	Coastwide	12,446.3	Amendment 21	91%	11,326.1	9%	1,120.2
YELLOWEYE	Coastwide	14.0	Biennial	N/A	1.1	N/A	12.9
Yellowtail rockfish	N of 40°10' N. lat.	4,982.1	Amendment 21	88%	4,384.2	12%	597.8

a/ The California scorpionfish fishery harvest guideline (147.8 mt) is further reduced to an ACT of 111 mt

b/ The cowcod fishery harvest guideline (8 mt) is further reduced to an ACT of 4 mt

c/ Pacific whiting TAC forecasts for 2017-2018 were unavailable during the preparation of the analysis; therefore the 2015 values were used.

Table 4-85. Alternative 2. Allocations and projected mortality impacts (mt) of overfished groundfish species for 2017 and 2018.

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFP c/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	188.6	57.3	1.4	0.2	359.9	107.6	139.3	45.0	1.1	0.1
--SB Trawl	188.6	57.3	1.4	0.2	341.0	98.7	122.0	39.1	1.1	0.1
--At-sea whiting MS					7.8	5.2	7.2	2.5		
--At-sea whiting CP					11.0	3.7	10.2	3.4		
Non-Trawl Allocation	596.0	169.8	2.6	2.2	18.9	7.2	7.3	0.5	12.9	12.1
Non-Nearshore	182.1	0.0		0.0		7.0		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.3	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	411.6	169.3		2.2		--		--	3.9	3.7
TOTAL	790.0	232.5	6.0	4.4	406.0	142.0	171.0	69.9	20.0	18.2
2017 Harvest Specification	790	790	10.0	10.0	406	406	171	171	20	20
Difference	0.0	557.5	4.0	5.6	0.0	264.0	0.0	101.1	0.0	1.8
Percent of ACL	100.0%	29.4%	60.0%	43.7%	100.0%	35.0%	100.0%	40.9%	100.0%	91.1%
Key			= not applicable							
	--		= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

Fishery	Bocaccio b/		Cowcod b/		Dkbl		POP		Yelloweye	
	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts	Allocation a/	Projected Impacts
-										
Off the Top Deductions	5.4	5.4	2.0	2.0	27.2	27.2	24.4	24.4	6.0	6.0
EFP c/										
Research d/	4.6	4.6	2.0	2.0	2.5	2.5	5.2	5.2	3.3	3.3
Incidental OA e/	0.8	0.8	0.0	0.0	24.5	24.5	10.0	10.0	0.4	0.4
Tribal f/					0.2	0.2	9.2	9.2	2.3	2.3
Trawl Allocations	176.8	53.7	1.4	0.2	372.3	106.8	144.0	45.2	1.1	0.0
--SB Trawl	176.8	53.7	1.4	0.2	353.0	97.9	127.0	39.3	1.1	0.0
--At-sea whiting MS					8.0	5.2	7.2	2.5		
--At-sea whiting CP					11.4	3.7	10.2	3.4		
Non-Trawl Allocation	558.8	169.8	2.6	2.2	19.6	7.5	7.6	0.5	12.9	12.1
Non-Nearshore	170.7	0.0		0.0		7.3		0.5	0.7	0.8
LE FG										
OA FG										
Directed OA: Nearshore	2.2	0.5		0.0		0.2		0.0	2.0	2.0
Recreational Groundfish										
WA						--		--	3.3	2.7
OR						--		--	3	2.9
CA	385.9	169.3		2.2		--		--	3.9	3.7
TOTAL	741.0	228.9	6.0	4.4	419.1	141.5	176.0	70.1	20.0	18.1
2018 Harvest Specification	741	741	10.0	10.0	419	419	176	176	20	20
Difference	0.0	512.1	4.0	5.6	-0.1	277.5	0.0	105.9	0.0	1.9
Percent of ACL	100.0%	30.9%	60.0%	43.7%	100.0%	33.8%	100.0%	39.8%	100.0%	90.7%
Key			= not applicable							
		--	= trace, less than 0.1 mt							
			= Fixed Values							
			= Projection from GMT Model							
			= off the top deductions							

4.1.3.1 Harvest Guidelines and Other Allocations

The canary rockfish recreational HGs as well as the nearshore and non-nearshore shares are lower under Alternative 1 (Table 4-86), compared to No Action (Table 4-7), coincident with the decrease in the ACLs. The HGs described under No Action (Section 0) for blackgill rockfish in 2017, blue rockfish south of 42° N. latitude, California scorpionfish south of 34°27' N. latitude, and Minor Nearshore Rockfish north of 40°10' N. latitude would also apply under Alternative 2.

Table 4-86. Alternative 1 Allocations, HGs, and shares of Canary Rockfish.

Sector	2017	2018
Fishery Harvest Guideline	522.6	460.6
Trawl Allocation	278.4	245.4
<i>Shorebased IFQ</i>	211.5	186.4
<i>Catcher Processor</i>	39.1	34.4
<i>Mothership</i>	27.8	24.5
Non-Trawl Allocations	244.2	215.2
<i>Non-Nearshore</i>	18.6	16.4
<i>Nearshore Fixed Gear</i>	32.8	28.9
<i>Washington Recreational a/</i>	16.6	14.7
<i>Oregon Recreational a/</i>	57.3	50.5
<i>California Recreational a/</i>	118.9	104.8
a/ Values represent HGs which may be adjusted within the non-trawl allocation.		

4.1.3.2 Overview of Management Measures

The following bullet points summarize management measure changes by sector under Alternative 2. A more detailed discussion of management measures by sector follows. New measures, discussed in Chapter 3 and analyzed in Appendix B, could also be implemented.

- Trawl Sectors: Notable changes include higher trawl allocations for darkblotched and widow rockfishes and lower allocations for canary rockfish compared to No Action. Accordingly, the shorebased IFQ and allocations to the at-sea whiting co-ops would be higher for darkblotched and widow rockfishes and lower for canary rockfish, compared to No Action.
- Non-Trawl Sector: Notable changes include higher non-trawl allocations for darkblotched and widow rockfishes and lower allocations for canary rockfish, compared to No Action.
 - The non-nearshore and nearshore shares of canary rockfish would decrease, compared to No Action; however, the RCA and trip limit options described under No Action would still apply under Alternative 2.
 - Tribal fisheries would operate under the same management measures as No Action.
 - Washington, Oregon, and California recreational fisheries would have lower canary rockfish HGs under Alternative 2; however the fishery would still operate under the same management measures described under the No Action Alternative.

4.1.3.3 Shorebased IFQ – Alternative 2

The trawl RCA structure under Alternative 2 is the same as No Action (Tables 4-9 and 4-10). Allocations and projections differ between Alternative 2 and No Action only for three species; canary, darkblotched, and widow rockfishes. The canary rockfish allocation under Alternative 1 is one third of the No Action alternative, and so is the projection, since canary rockfish catch has co-varied responsively with changes in the allocation, both under IFQ and trip limit management. The darkblotched rockfish allocation under Alternative 1 is more than 60 percent higher than under No Action. The projected catch is only slightly higher under Alternative 1, since catch of darkblotched rockfish has not shown appreciable responsiveness to changes in the allocation, under IFQ. Both the allocation and the projected catch are more than eight times higher for widow rockfish under Alternative 1 than under No Action, since catch of widow rockfish has been highly responsive to changes in the allocation. Big skate impacts, trip limits, and management measures would be the same as Alternative 1.

Table 4-9. Alternative 2 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 2 for 2017 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 2 2017		No Action 2017	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,302.2	11,050.6	2,302.2	11,050.6
BOCACIO	South of 40°10' N. lat.	57.3	188.6	57.3	188.6
Canary Rockfish	Coastwide	168.5	211.5	538.6	676.1
Chilipepper	South of 40°10' N. lat.	353.8	1,943.3	353.8	1,943.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	98.7	552.7	97.6	341.1
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	240.7	9,258.6	240.7	9,258.6
Lingcod	North of 40°10' N. lat.	315.4	1,359.9	315.4	1,359.9
Lingcod	South of 40°10' N. lat.		559.4		559.4
Longspine thornyheads	North of 34°27' N. lat.	942.7	2,699.8	942.7	2,699.8
Minor Shelf Rockfish	South of 40°10' N. lat.	66.5	1,149.9	66.5	1,149.9
Minor Shelf Rockfish	North of 40°10' N. lat.	15.5	195.9	15.5	195.9
Minor Slope Rockfish	North of 40°10' N. lat.	260.6	1,269.6	260.6	1,269.6
Minor Slope Rockfish	South of 40°10' N. lat.	119.5	433.3	119.5	433.3
Other Flatfish	Coastwide	1,549.2	7,455.4	1,549.2	7,455.4
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut c/	North of 40°10' N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.1	121.9	39.1	121.9
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
PETRALE SOLE	Coastwide	2,620.2	2,745.3	2,620.2	2,745.3
Sablefish	North of 36° N. lat.	2,660.0	2,790.1	2,660.0	2,790.1
Sablefish	South of 36° N. lat.	143.9	449.4	143.9	449.4
Shortspine thornyheads	North of 34°27' N.	695.0	1,551.3	695.0	1,551.3
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,663.3	64.1	1,663.3
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	9,178.0	11,400.4	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,401.5	4,254.9	1,401.5	4,254.9

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch.

b/ As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

c/ The Pacific whiting TAC was unavailable during the preparation of the EIS, therefore the 2015 values were used.

Table 4-10. Alternative 2 – Shorebased IFQ. Projected mortality for IFQ species under Alternative 2 for 2018 compared to the allocations or set-asides. No action estimates of mortality are provided (right panel).

IFQ Species	Area	Alternative 2 2018		No Action 2018	
		Projected Mortality (mt)	SB IFQ Allocation (mt)	Projected Mortality (mt)	SB IFQ Allocation (mt)
Arrowtooth flounder	Coastwide	2,299.8	10,992.6	2,299.8	10,992.6
BOCACIO	South of 40°10' N. lat.	53.7	176.8	53.7	176.8
Canary Rockfish	Coastwide	148.5	186.4	498.0	625.1
Chilipepper	South of 40°10' N. lat.	353.8	1,868.3	353.8	1,868.3
COWCOD	South of 40°10' N. lat.	0.17	1.44	0.17	1.4
DARKBLOTCHED	Coastwide	97.9	563.5	97.9	352.8
Dover sole	Coastwide	7,062.1	45,981.0	7,062.1	45,981.0
English sole	Coastwide	220.2	6,953.0	220.2	6,953.0
Lingcod	North of 40°10' N. lat.	291.0	1,259.5	291.0	1,259.5
Lingcod	South of 40°10' N. lat.		511.2		511.2
Longspine thornyheads	North of 34°27' N. lat.	939.5	2,560.2	939.5	2,560.2
Minor Shelf Rockfish	South of 40°10' N. lat.	66.4	1,148.7	66.4	1,148.7
Minor Shelf Rockfish	North of 40°10' N. lat.	15.5	196.0	15.5	196.0
Minor Slope Rockfish	North of 40°10' N. lat.	260.5	1,268.8	260.5	1,268.8
Minor Slope Rockfish	South of 40°10' N. lat.	101.5	357.1	101.5	357.1
Other Flatfish	Coastwide	1,319.3	6,349.3	1,319.3	6,349.3
Pacific cod	Coastwide	156.5	1,031.4	156.5	1,031.4
Pacific halibut c/	North of 40°10' N. lat.	26.1	84.5	26.1	84.5
PACIFIC OCEAN PERCH	North of 40°10' N. lat.	39.3	126.6	39.3	126.6
Pacific whiting b/	Coastwide	83,693.1	112,007.3	83,693.1	112,007.3
PETRALE SOLE	Coastwide	2,508.7	2,628.5	2,508.7	2,628.5
Sablefish	North of 36° N. lat.	2,776.3	2,912.1	2,776.3	2,912.1
Sablefish	South of 36° N. lat.	149.9	468.3	149.9	468.3
Shortspine thornyheads	North of 34°27' N.	694.5	1,537.0	694.5	1,537.0
Shortspine thornyheads	South of 34°27' N	2.5	50.0	2.5	50.0
Splitnose rockfish	South of 40°10' N. lat.	64.1	1,664.2	64.1	1,664.2
Starry flounder	Coastwide	10.0	630.9	10.0	630.9
Widow rockfish	Coastwide	8,589.3	10,669.2	1,078.8	1,340.1
YELLOWEYE ROCKFISH	Coastwide	0.08	1.15	0.08	1.1
Yellowtail rockfish	North of 40°10' N. lat.	1,347.9	4,084.2	1,347.9	4,084.2

a/ Pacific halibut is managed using IBQ, see regulations at §660.140. Starting in 2015, the maximum IBQ allocation is 45 mt, see (§660.55 (m)). There is no projection model for Pacific halibut bycatch.

b/ As stated in regulations (§660.55 (m)), a Pacific halibut set-aside of 10 mt, to accommodate bycatch in the at-sea Pacific whiting fisheries and in the shorebased trawl sector south of 40°10' N. latitude (estimated to 5 mt each). There is no projection model for Pacific halibut bycatch.

c/ The Pacific whiting TAC was unavailable during the preparation of the analysis, therefore the 2015 values were used.

4.1.3.4 At-Sea Whiting Co-ops – Alternative 2

The at-sea whiting co-ops would operate under the same management measures described under No Action with a few modifications. The 2017-2018 allocations for the catcher-processor and mothership sectors under Alternative 2 are provided in Table 4-87 and compared to No Action. Notable differences from No Action include lower canary rockfish allocations and higher darkblotched and widow rockfish allocations. Projected catches under the bootstrap simulation would be the same as Alternative 1, as the only allocation that changes is for canary rockfish, which was unrestricted in the simulation (Table 4-77 and Table 4-78). All other allocations were the same. The projections under the bycatch rate approach are the same as under No Action since the whiting TAC remains the same. At-sea whiting set-asides would be the same under Alternative 2 as under No Action (Table 4-20).

Table 4-87. Alternative 2 – At-Sea. Allocations for the catcher-processor (CP) and mothership sectors (MS) under Alternative 2. The No Action allocations are provided (right panel) for reference.

Stock	Area	Alternative 2				No Action			
		2017		2018		2017		2018	
		CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)	CP All. (mt)	MS All. (mt)
Canary rockfish	Coastwide	39.1	27.8	34.4	24.5	124.9	89.0	115.5	82.3
DARKBLOTCHED	Coastwide	17.8	12.6	18.2	12.8	11	7.8	11.4	8.0
POP	N of 40°10' N. lat.	10.2	7.2	10.2	7.2	10.2	10.2	7.2	7.2
Pacific whiting a/	Coastwide	90,673	64,004	90,673	64,004	90,673	64,004	90,673	64,004
Widow rockfish	Coastwide	411.5	290.5	385.1	271.8	170	170	120	120

a/ The 2017 and 2018 Pacific whiting TACs were unavailable during the preparation of the analysis, therefore the 2015 values were used.

4.1.3.5 Limited Entry and Open Access Fixed Gear– Alternative 2

Non-Nearshore – Alternative 2

Alternative 2 is similar to the No Action Alternative, except that the non-trawl allocations for darkblotched and widow rockfishes are higher while canary rockfish is lower (Table 4-82 and Table 4-84). Under Alternative 2, the nearshore and non-nearshore trip limits and RCA structure described under No Action would apply. While the nearshore and non-nearshore fishery shares of canary rockfish decrease compared to No Action, the canary rockfish trip limits do not change because they were developed only to allow for retention of previously discarded landings, not to encourage targeting.

Nearshore – Alternative 2

There are three changes for the nearshore fishery under Alternative 2, compared to No Action. The canary rockfish ACL, non-trawl allocation, and nearshore share is lower under Alternative 2 (Table 4-82 and Table 4-84), compared to No Action (Table 4-2 and Table 4-4). Additionally, the California black rockfish and California scorpionfish south of 34°27' N. latitude ACLs and non-trawl allocations are lower under Alternative 2 (Table 4-82 and Table 4-84), compared to No Action (Table 4-2 and Table 4-4). However, the same management measures and trip limit options described under No Action would apply under Alternative 2 since projected mortality is well below the nearshore share and therefore reduced trip limits

are not needed to keep catch below the reduced ACLs and non-trawl allocations (canary, Table 4-47; black rockfish CA, Table 4-50; and California scorpionfish south of 34°27' N. latitude Table 4-52).

It is noteworthy that Alternative 2 has the greatest potential that total mortality of canary rockfish could exceed the nearshore share. For instance, total mortality for a 300 lb trip limit for the open access fishery and 14 percent targeting is projected to be 18.9 mt, which is within 10 mt of the 2018 allocation (Table 4-47). If targeting is greater than projected, there is greater potential for the fishery to exceed their allocation.

4.1.3.6 Tribal Fisheries – Alternative 2

Tribal fisheries would operate under the HGs and allocations displayed in Table 4-81 and Table 4-83. Tribal fisheries would be managed using the same measures described under No Action.

4.1.3.7 Washington Recreational – Alternative 2

Alternative 2 is similar to the No Action Alternative, except that the Washington recreational HG for canary rockfish decreases to 16.6 mt in 2017 and 22.9 mt in 2018 (Table 4-79) compared to No Action (Table 4-54). Under Alternative 1, the Washington recreational season structure (Status Quo Table 4-55 and Option 1 Table 4-56) and sub-bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-57).

Table 4-88. Alternative 2: Washington recreational HGs for 2017 and 2018.

Stock	2017	2018
Canary Rockfish	16.6	14.7
YELLOWEYE ROCKFISH	3.3	3.3
Black Rockfish	287	283
Nearshore Rockfish	13.1	13.1

4.1.3.8 Oregon Recreational – Alternative 2

Alternative 2 is similar to the No Action Alternative, except that the Oregon recreational HG for canary rockfish decreases to 57.3 mt in 2017 and 50.5 mt in 2018 (Table 4-89 and Table 4-79) compared to No Action (Table 4-58). Under Alternative 2, the Oregon recreational season (Figure 4-5) and sub-bag limit options are the same as No Action. Projected mortality is the same as No Action (Table 4-60).

Table 4-89. Oregon recreational Federal HGs (in mt) and state quotas under the Alternative 2 for 2017-2018.

Stock	HG and State Quotas a/	
	2017	2018
Canary Rockfish	57.3	50.5
YELLOWEYE ROCKFISH	3.0	3.0
Black Rockfish OR ^{b/}	400.1	394.7
Greenlings ^{c/}	41.1	34.9
Nearshore Rockfish N. of 40°10' N. lat. ^{d/}	44.5	44.5

a/ Federal HG are established for canary and yelloweye rockfish only. The state process in Oregon establishes quotas for black rockfish, blue rockfish, other Nearshore Rockfish, and greenlings (all species). The state quotas, which are yet to be determined are not intended to be implemented in Federal regulation, they are only provided as information.

b/ The values shown are the presumptive share, based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations

c/ Includes kelp and other greenlings. The values shown are the presumptive share based on the 2015 recreational and commercial sharing percentages in Oregon State Regulations.

d/ Includes blue rockfish. The state of Oregon has a Federal HG for Nearshore Rockfish North of 40°10' N. Lat. of 60.5 mt, which is shared between the Oregon commercial nearshore and recreational fisheries. The values shown are the presumptive share, based on 2015 recreational and commercial sharing percentages in Oregon State Regulations.

4.1.3.9 California Recreational – Alternative 2

Alternative 2 is similar to the No Action Alternative except the California recreational HG for canary rockfish decreases to 118.9 mt in 2017 and 104.8 mt in 2018 and the allowable limit for black rockfish is reduced to 319 mt when compared to No Action. The California scorpionfish HG remains 111 mt, and as such the decrease in the ACL under Alternative 2, compared to No Action, does not result in changes to management measures.

Under Alternative 2, the California recreational season structure options are the same as No Action (Option 1 Figure 4-8; Option 2 Figure 4-9; Option 3 Figure 4-10; Option 4 Figure 4-11). Projected mortality for most species is similar to No Action, except for black rockfish (Option 1 Table 4-63; Option 2 Table 4-64; Option 3 Table 4-65; Option 4 Table 4-66).

Given the reduced allowable limit for black rockfish the sub-bag limit would need to be further reduced statewide to two fish to accommodate season structure Option 1 (Figure 4-8; 123.2 mt) and season structure Option 2 (Figure 4-9; 125.1 mt). A three fish sub-bag limit could be accommodated statewide under season structure Option 3 (Figure 4-10; 202.2 mt). A five fish sub-bag limit could be accommodated statewide under season structure Option 4 (Figure 4-11; 135.9 mt).

4.1.4 Summary of Groundfish Mortality under the Alternatives

Detailed descriptions of the fishery management measures and the modeled estimates of groundfish mortality are reported by alternative and sector in Sections 4.1.1, 4.1.2, and 4.1.3. Impacts to groundfish stocks are assessed in relation to limit reference points (OFL, MSST). In this context although management measures are designed to achieve but not exceed ACL, impacts to stock status are evaluated under the assumption that all of the ACL is harvested. Historically, however, given a variety of factors like overfished species interactions, market conditions, weather, etc., there are very few stocks and complexes where the ACL is achieved. Each biennium, GMT catch projection models are used to adjust management measures to better attain ACLs while limiting the risk that ACLs are exceeded (and since the ACL is a precautionary reduction from the limit reference point, even exceeding it does not represent a serious adverse impact).

Despite the best efforts to improve ACL attainment, there is little interannual variation on ACL attainment for most species.

4.2 Short-Term Socioeconomic Impacts of the Integrated Alternatives

This section evaluates the effects of the alternatives on fishery participants and fishing communities. Section 3.2 in the EIS for the 2015-2016 harvest specifications and management measures and Amendment 24 (PFMC and NMFS 2015) describes the economic status of these affected groups during the baseline period used for that analysis (2003 to 2012) based on historical commercial landings data, estimates of recreational fishing activity, and census data. Updated baseline information may be found in the 2016 Groundfish SAFE (PFMC 2016). Here, various methods are used to estimate how conditions may change from the baseline, either by applying harvest specifications based on default HCRs and compliant management measures (No Action Alternative) or under Alternatives 1 and 2, which contain different ACLs for key stocks and default ACLs for the remaining stocks.

The 2015 EIS (PFMC and NMFS 2015) describes the models and data used to project socioeconomic impacts. Updated documentation of the models may be found in Appendix A. Projection models include:

- GMT catch projection models for different commercial sectors of the groundfish fishery
- GMT fishing effort (angler trips) projection models for the recreational groundfish fishery
- The landings distribution model (LDM), which is used to estimate where landings are likely to occur and the resulting port-level ex-vessel revenue
- The IOPAC model used to evaluate the effect of the alternatives on coastal communities (ports where commercial groundfish landings and recreational groundfish effort occur) by estimating personal income generated (“income impacts”) and associated employment
- Net revenue in commercial fishery operations based on projected landings and vessel cost earnings surveys.

The following sections assess socioeconomic impacts in terms of:

- Changes in commercial ex-vessel revenue by fishery sector
- Change in recreational angler trips by community
- Change in net revenue by fishery
- Change in income and employment impacts by community resulting from changes in commercial landings revenue and recreational effort.

4.2.1 Change in Ex-Vessel Revenue and Angler Trips

4.2.1.1 Commercial Fisheries

Revenue estimates are based on projected landings estimates from the GMT models referenced above. Table 4-90, Table 4-91, and Table 4-92 compare ex-vessel revenue estimates under the action alternatives to the No Action Alternative. Projections assume average ex-vessel prices observed in 2015. Effects are presented according to groundfish fishery “sectors,” which are described in Section XXX (also see the 2015 EIS PFMC and NMFS 2015, Section 3.2.2). Table 4-93, Table 4-94, and Table 4-95 compare projected shoreside commercial ex-vessel revenue under the alternatives to the annual average for the 2011-2015 baseline period.⁵ Note that revenue projections are more aggregated in these tables and they don’t include

⁵ Ex-vessel revenue for 2015 should be considered provisional since not all fish tickets had been entered into PacFIN by the query date of February 3, 2016.

estimates for some of the sectors, such as at-sea whiting and tribal groundfish fisheries, included in Table 4-90 through Table 4-92.

The TAC for Pacific whiting is set annually outside of this harvest specifications process. The 2015 Pacific whiting TAC and allocations are used to derive an estimate of catch and resulting revenue for the whiting sectors. For the at-sea sectors revenue are assumed to be the same across all alternatives.

Compared to No Action (Table 4-90-Table 4-92):

- Alternative 1 shows an overall increase in shoreside ex-vessel revenue of \$6.6 million to a total of \$95.3 million and Alternative 2 shows an increase of \$6.5 million to \$95.2 million. These revenue changes occur exclusively in the shoreside non-whiting IFQ sector (trawl and fixed gear).

Table 4-90. Estimated ex-vessel revenues by groundfish harvest sector under the alternatives (2015 \$million).

	No Action	Pref. Alternative	Alternative 1	Alternative 2
Shoreside Sectors:				
Whiting	13.3		13.3	13.3
Non-whiting Trawl+Non-trawl IFQ	40.0		46.7	46.5
Limited Entry Fixed Gear	16.3		16.3	16.3
Nearshore Open Access	4.6		4.6	4.6
Non-nearshore Open Access	4.5		4.5	4.5
Incidental Open Access	0.2		0.2	0.2
Tribal (incl. whiting)	9.9		9.9	9.9
Shoreside sectors' Totals	88.7		95.3	95.2
At-sea Sectors:				
Non Tribal Whiting	25.9		25.9	25.9
Tribal Whiting	5.1		5.1	5.1
At-sea sectors' Totals	31.0		31.0	31.0
TOTAL Groundfish Revenue	119.8		126.4	126.3

Table 4-91. Change in groundfish ex-vessel revenues from the No Action Alternative by groundfish harvest sector under the action alternatives (2015 \$million).

	No Action	Pref. Alternative	Alternative 1	Alternative 2
Shoreside Sectors:				
Whiting	13.3		+0.0	+0.0
Non-whiting Trawl+Non-trawl IFQ	40.0		+6.6	+6.5
Limited Entry Fixed Gear	16.3		+0.0	+0.0
Nearshore Open Access	4.6		+0.0	+0.0
Non-nearshore Open Access	4.5		+0.0	+0.0
Incidental Open Access	0.2		+0.0	+0.0
Tribal (incl. whiting)	9.9		+0.0	+0.0

Shoreside sectors' Totals	88.7		+6.6	+6.5
At-sea Sectors:				
Non Tribal Whiting	25.9		+0.0	+0.0
Tribal Whiting	5.1		+0.0	+0.0
At-sea sectors' Totals	31.0		+0.0	+0.0
TOTAL Groundfish Revenue	119.8		+6.6	+6.5

Table 4-92. Change in groundfish ex-vessel revenues from the No Action Alternative by shoreside harvest sector under the action alternatives (percent).

	No Action	Pref. Alternative	Alternative 1	Alternative 2
Shoreside Sectors:				
Whiting	13.3		+0.0%	+0.0%
Non-whiting Trawl+Non-trawl IFQ	39.2		+16.5%	+16.2%
Limited Entry Fixed Gear	16.3		+0.0%	+0.0%
Nearshore Open Access	4.6		+0.0%	+0.0%
Non-nearshore Open Access	4.5		+0.0%	+0.0%
Incidental Open Access	0.2		+0.0%	+0.0%
Tribal (incl. whiting)	9.9		+0.0%	+0.0%
Shoreside sectors' Totals	88.7		+7.4%	+7.3%
At-sea Sectors:				
Non Tribal Whiting	25.9		+0.0%	+0.0%
Tribal Whiting	5.1		+0.0%	+0.0%
At-sea sectors' Totals	31.0		+0.0%	+0.0%
TOTAL Groundfish Revenue	119.8		+5.5%	+5.4%

Compared to the 2011-2015 baseline period (Table 4-93-Table 4-95)

- Alternative 1 shows the largest increase in ex-vessel revenue at \$13 million across all shoreside sectors, although Alternative 2 is almost the same at \$12.9 million.
- The shoreside whiting sector shows a decline of \$8.3 million from the baseline but it must be remembered that this ex-vessel revenue estimates assumes the Pacific whiting TAC in 2017-2018 will be the same as the 2015 TAC. In reality, the TAC could be higher or lower.
- Alternative 2 only differs in projected ex-vessel revenue from Alternative 1 by \$100,000 less revenue in the shoreside non-whiting IFQ sector.
- No Action shows the smallest increase from the baseline, an increase of \$6.4 million to a total of \$78.7 million or an increase of almost 9 percent.
- In relative terms the smallest projected revenue increase is 21.4 percent in the non-nearshore fixed gear sector. The largest relative increase occurs in the non-whiting IFQ fishery under Alternative 1, at 55.6 percent.

Table 4-93. Groundfish ex-vessel revenues under the Baseline (5-year 2011 to 2015 inflation-adjusted average annual ex-vessel revenue) and 2017-18 Alternatives by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (2015 \$million).

\$ million	<i>Baseline</i>	No Action	Pref. Alternative	Alternative 1	Alternative 2
Whiting	21.6	13.3		13.3	13.3
Non-whiting Trawl+Non-trawl IFQ	30.0	40.0		46.7	46.5
Nearshore Fixed Gear	3.6	4.6		4.6	4.6
Non-nearshore Fixed Gear	17.1	20.8		20.8	20.8
Total	72.3	78.7		85.3	84.3

Table 4-94. Change in groundfish ex-vessel revenues from the Baseline (5-year 2011 to 2015 inflation-adjusted average annual ex-vessel revenue) by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (2015 \$million).

\$ million	<i>Baseline</i>	No Action	Pref. Alternative	Alternative 1	Alternative 2
Whiting	21.6	-8.3		-8.3	-8.3
Non-whiting Trawl+Non-trawl IFQ	30.0	+10.1		+16.7	+16.6
Nearshore Fixed Gear	3.6	+0.9		+0.9	+0.9
Non-nearshore Fixed Gear	17.1	+3.7		+3.7	+3.7
Totals	72.3	+6.4		+13.0	+12.9

Table 4-95. Change in groundfish ex-vessel revenues from the Baseline (5 year 2011–2015 inflation-adjusted average annual ex-vessel revenue) by aggregated non-tribal shoreside commercial harvest sector under the commercial fishery alternatives (percent).

\$ million	<i>Baseline</i>	No Action	Pref. Alternative	Alternative 1	Alternative 2
Whiting	21.6	-38.4%		-38.4%	-38.4%
Non-whiting Trawl+Non-trawl IFQ	30.0	+33.6%		+55.6%	+55.3%
Nearshore Fixed Gear	3.6	+25.5%		+25.5%	+25.5%
Non-nearshore Fixed Gear	17.1	+21.4%		+21.4%	+21.4%
Totals	72.3	+8.8%		+18.0%	+17.8%

In the 2015 EIS, the discussion of modeling commercial fishery impacts presents a number of caveats

- Effort displaced by management measures is assumed not to switch readily into another fishery sector or geographic region
- Landings projection models and economic impact models like IOPAC are calibrated to represent a baseline or “snapshot” of the economy at a particular point in time. Consequently these models are best able to address impacts of scenarios that are not too far removed from the realm of what has occurred in the recent past.
- Catch projections in the IFQ fishery may not reflect the leveraging effect of increases in ACLs for “choke” species (those with low ACLs/allocations. A higher allocation of, for example, canary

rockfish to the shorebased IFQ fishery may generate more actual revenue than is forecast using the current catch projection models.

- Stock recruitment variability and catch monitoring uncertainty mean that actual catches may differ from the projections. Although actual ACL attainment may differ from projections, inseason management measures are applied to prevent ACLs from being exceeded
- As noted above, the Pacific whiting TAC is determined annually, consistent with the Agreement with Canada on Pacific Hake/Whiting; 73.88 percent of the TAC is allocated to U.S. fisheries. Since the TAC and resulting allocation is not determined during the harvest specifications process, a historical TAC is used to estimate socioeconomic impacts. The actual TACs for 2017 and 2018 could be higher or lower than the assumed value.

For more discussion of these caveats see pages 370-371 in the 2015 EIS.

4.2.1.2 Recreational Fisheries

For recreational fisheries, projected marine area angler boat trips taken in groundfish plus Pacific halibut recreational fisheries are compared to historical recreational fishing effort under the proposed management alternatives. Table 4-96, Table 4-97, and Table 4-98 compare average annual recreational angler trips during the 2010-2014 baseline period to projected angler effort under the alternatives. Results are shown by coastal regions that are aggregated from statistical reporting regions.⁶

The Council wished to explore a number of recreational management options under each of the alternative ACLs and allocations. Most of these management variations have a modest effect on project angler fishing effort. To produce a tractable number of projections that cover the range of potential effort levels (and below, personal income and employment), the alternatives and these management options are presented in five scenarios in addition to No Action. For more information about the proposed management options see Section 4.

The change in recreational fishing effort from the baseline period:

- Under Alternatives 1 and 2:
 - With California Options 1 and 3 the increase from the baseline is 204,800 angler trips or 25 percent.
 - With California Option 4 there is a substantial decrease in angler trips of 260,100 (-31 percent).
- Under Alternative 1, with California Options 1 and 3 and the Washington State Option, a very similar increase—204,400 angler trips (25 percent) is estimated.
- No Action shows the same increase as Alternatives 1 and 2 combined with California Options 1 and 3.⁷
- Alternative 1 with California Option 2 shows the largest increase, 212,800 angler trips or 26 percent.

There are regional differences in the projected changes in angler trips:

- Since Southern California accounts for the largest share of coastwide recreational angler trips (61% during the baseline period), the Santa Barbara to San Diego region also shows the largest nominal changes in effort ranging from an increase of 102,000 trips (20%) across all the scenarios except for California Option 4 where angler trips would decline by 238,800 (-47%).

⁶ The Puget Sound region is not shown in these tables because Council managed recreational fisheries do not occur in this region.

⁷ Due to rounding there are slight differences in the fractional percentages for equivalent angler effort estimates.

- The largest relative increases across all the alternatives are projected for the Fort Bragg to Bodega Bay region. These increases are 85%-89% except for under California Option 4 where the increase is 50%.
- The San Francisco region shows the next largest relative increase for all scenarios except California Option 4 at almost 80 percent. This is an increase of 44,000 angler trips to a total of 100,000.
- The rest of Northern California (Crescent City to Bodega Bay) also shows higher relative increases than Southern California or Washington/Oregon. The highest relative increase in Northern California (89%) is projected for the Fort Bragg-Bodega Bay region under California Option 2. This would be an increase of 10,200 angler trips to a total of 21,600.
- Washington and Oregon account for 15 percent of total angler trips during the baseline period, and the projected changes in angler trips are more modest than in the California regions. The Washington Coast shows relative increases across the alternatives, ranging from 16.3 percent to 16.8 percent. (The Washington groundfish season alternative under Alternative 1 shows the smaller increase.) This translates into 5,200-5,400 more angler trips to increase the totals to above 37,000.
- In Oregon relative changes range from declines of less than 1 percent in the Coos Bay-Brookings region to an increase of 7.4 percent for the Astoria-Tillamook region. These changes do not vary across the alternatives.

In modeling recreational fishery impacts, it is assumed that anglers who are displaced or discouraged by management measures under a particular alternative cannot switch readily into a different fishery in the same region or another region elsewhere along the coast. Thus the numbers reported below probably represent something of an upper bound on regional economic impacts on recreational fisheries, or the maximum amount of displacement likely to occur under the alternatives. This also means that the models may not necessarily be able to distinguish subtle differences resulting from relatively fine distinctions between the alternatives if those differences lie within the models' margins of error.

Table 4-96. Estimated Recreational Effort (halibut+bottomfish) under the Baseline and 2017-18 Alternatives (thousands of angler trips).

Community Groups	<i>Baseline (av. 2010-2014)</i>	<i>No Action</i>	Alternative 1 (CA Ops 1 & 3)	Alternative 2 (CA Ops 1 & 3)	Alts. 1 & 2 (CA Op 2)	Alts. 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 & 3) + WA Groundfish Season Alt
Washington Coast	32.1	37.4	37.4	37.4	37.4	37.4	37.3
Astoria-Tillamook	15.0	16.1	16.1	16.1	16.1	16.1	16.1
Newport	45.4	48.0	48.0	48.0	48.0	48.0	48.0
Coos Bay-Brookings	34.8	34.7	34.7	34.7	34.7	34.7	34.7
Crescent City-Eureka	23.2	30.6	30.6	30.6	38.1	23.1	30.6
Fort Bragg - Bodega Bay	11.4	21.1	21.1	21.1	21.6	17.2	21.1
San Francisco Area	56.0	100.4	100.4	100.4	100.4	51.3	100.4
SC – Mo – MB*	105.6	137.9	137.9	137.9	137.9	74.5	137.9
SB – LA – SD*	509.0	611.0	611.0	611.0	611.0	270.1	611.0
Coastwide Total	832.4	1,037.2	1,037.2	1,037.2	1,045.2	572.3	1,037.0

Table 4-97. Estimated change from Baseline Recreational Effort (halibut+bottomfish) under the 2017-18 Alternatives (thousands of angler trips).

Community Groups	<i>Baseline (av. 2010-2014)</i>	<i>No Action</i>	Alternative 1 (CA Ops 1 & 3)	Alternative 2 (CA Ops 1 & 3)	Alts. 1 & 2 (CA Op 2)	Alts. 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 & 3) + WA Groundfish Season Alt
Washington Coast	32.1	+5.4	+5.4	+5.4	+5.4	+5.4	+5.2
Astoria-Tillamook	15.0	+1.1	+1.1	+1.1	+1.1	+1.1	+1.1
Newport	45.4	+2.5	+2.5	+2.5	+2.5	+2.5	+2.5
Coos Bay-Brookings	34.8	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Crescent City-Eureka	23.2	+7.4	+7.4	+7.4	+14.9	-0.2	+7.4
Fort Bragg - Bodega Bay	11.4	+9.7	+9.7	+9.7	+10.2	+5.8	+9.7
San Francisco Area	56.0	+44.4	+44.4	+44.4	+44.4	-4.7	+44.4
SC – Mo – MB*	105.6	+32.3	+32.3	+32.3	+32.3	-31.1	+32.3
SB – LA – SD*	509.0	+102.0	+102.0	+102.0	+102.0	-238.8	+102.0
Coastwide Total	832.4	+204.8	+204.8	+204.8	+212.8	-260.1	+204.6

Table 4-98. Estimated change from Baseline Recreational Effort (halibut+bottomfish) under the 2017-18 Alternatives (percent).

Community Groups	<i>Baseline (av. 2010-2014)</i>	<i>No Action</i>	Alternative 1 (CA Ops 1 & 3)	Alternative 2 (CA Ops 1 & 3)	Alts. 1 & 2 (CA Op 2)	Alts. 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 & 3) + WA Groundfish Season Alt
Washington Coast	32.1	+16.8%	+16.8%	+16.8%	+16.8%	+16.8%	+16.3%
Astoria-Tillamook	15.0	+7.4%	+7.4%	+7.4%	+7.4%	+7.4%	+7.4%
Newport	45.4	+5.6%	+5.6%	+5.6%	+5.6%	+5.6%	+5.6%
Coos Bay-Brookings	34.8	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%
Crescent City-Eureka	23.2	+31.8%	+31.8%	+31.8%	+64.2%	-0.7%	+31.8%
Fort Bragg - Bodega Bay	11.4	+85.1%	+85.1%	+85.1%	+89.2%	+50.4%	+85.1%
San Francisco Area	56.0	+79.3%	+79.3%	+79.3%	+79.3%	-8.3%	+79.3%
SC – Mo – MB*	105.6	+30.6%	+30.6%	+30.6%	+30.6%	-29.5%	+30.6%
SB – LA – SD*	509.0	+20.0%	+20.0%	+20.0%	+20.0%	-46.9%	+20.0%
Coastwide Total	832.4	+24.6%	+24.6%	+24.6%	+25.6%	-31.2%	+24.6%

4.2.2 Cost and Net Revenue Estimates

Table 4-99 and Table 4-100 show revenue, cost, and net revenue estimates for the non-whiting trawl IFQ fishery, non-whiting non-trawl IFQ fishery, limited entry fixed gear fishery, open access nearshore fishery, and open access non-nearshore fishery provided by Drs. Carl Lian and Erin Steiner at the NWFSC.⁸ Results are presented for each alternative.

Accounting net revenues are calculated as the difference between the ex-vessel value of landings and the estimated costs incurred in achieving those landings.⁹ Net revenue results are not provided for the shoreside whiting fishery for two reasons. First, whiting prices in the various scenarios for 2017 and 2018 are \$.08 a pound, and during the period for which we have economic data (2011 to 2014) to estimate variable costs in the IFQ fishery, whiting prices were \$.10 to \$.14 per pound. Since crew members are typically paid a share of revenue with some deductions, this drop in whiting prices will likely have a substantial impact on crew costs, the largest variable cost category. However, this effect is not quantifiable at this time. Second, the NWFSC does not have sufficient economic data reflecting costs in the newly emerging non-whiting mid-water trawl fishery. Some scenarios for 2017 and 2018 assume the non-whiting mid-water trawl fishery is harvesting over 10 million pounds per year, whereas in 2014 (the most recent year of economic data) less than 2 million pounds of non-whiting were landed with mid-water gear. Given the emerging nature of this fishery, it is likely that the NWFC's data will be substantially improved when 2015 data from trawl fishery participants is collected (which is due September 1, 2016).

These two problems do not affect the other five fisheries, for which net revenue results are provided (see Table 4-99). The variable cost net revenue estimates (revenue minus variable costs) measure short-run profitability of operating a catcher vessel. Total cost net revenue (revenue minus total cost) measures the long-run profitability of operating a catcher vessel.

⁸ The ex-vessel revenue estimates are derived from the Landings Distribution Model.

⁹ These estimates are based on a comparison of landings revenues projected under the alternatives with landings and average costs reported in economic data reports (for IFQ sectors) and on cost-earnings surveys of samples of vessels in the remaining groundfish sectors. Values reported are "total cost net revenues," which include pro-rations of certain estimated fixed cost components in addition to the variable costs directly associated with each groundfish fishery sector.

Table 4-99. Estimates of ex-vessel revenue (output from Landings Distribution Model), variable cost net revenue (ex-vessel revenue net variable costs), and total cost net revenue (ex-vessel revenue net variable costs and fixed costs) by fishery for the alternatives. Values in dollars and for total cost net revenue as a percentage of gross revenue.

Fishery	Revenue (All Groundfish Species) by Fishery					
	2017			2018		
	No Action	Alt 1	Alt 2	No Action	Alt 1	Alt 2
Shoreside Whiting	\$14,140,995	\$17,383,856	\$17,367,164	\$14,126,202	\$17,131,628	\$17,116,771
Non-whiting Trawl	\$33,249,292	\$36,871,143	\$36,784,470	\$33,050,903	\$36,400,333	\$36,323,191
Non-whiting Fixed Gear	\$5,962,295	\$5,957,451	\$5,954,505	\$6,098,059	\$6,093,261	\$6,090,639
LE Fixed Gear	\$16,019,776	\$16,019,776	\$16,019,776	\$16,658,193	\$16,658,193	\$16,658,193
Open Access Nearshore	\$4,572,078	\$4,572,078	\$4,572,078	\$4,572,078	\$4,572,078	\$4,572,078
Open Access Non-nearshore	\$4,371,036	\$4,371,036	\$4,371,036	\$4,535,211	\$4,535,211	\$4,535,211
	Variable Cost Net Revenue					
Shoreside Whiting						
Non-whiting Trawl	\$15,071,435	\$16,024,437	\$15,986,071	\$14,882,023	\$15,761,712	\$15,727,564
Non-whiting Fixed Gear	\$2,220,290	\$2,194,037	\$2,174,242	\$2,223,740	\$2,197,337	\$2,179,719
LE Fixed Gear	\$5,339,390	\$5,339,390	\$5,339,390	\$5,554,519	\$5,554,519	\$5,554,519
Open Access Nearshore	\$2,292,746	\$2,292,746	\$2,292,746	\$2,292,746	\$2,292,746	\$2,292,746
Open Access Non-nearshore	\$2,010,988	\$2,010,988	\$2,010,988	\$2,090,042	\$2,090,042	\$2,090,042
	Total Cost Net Revenue By Fishery					
Shoreside Whiting						
Non-whiting Trawl	\$10,519,086	\$11,472,088	\$11,433,722	\$10,329,674	\$11,209,363	\$11,175,216
Non-whiting Fixed Gear	\$1,073,638	\$1,047,385	\$1,027,590	\$1,077,088	\$1,050,685	\$1,033,067
LE Fixed Gear	\$2,875,424	\$2,875,424	\$2,875,424	\$3,090,553	\$3,090,553	\$3,090,553
Open Access Nearshore	\$389,301	\$389,301	\$389,301	\$389,301	\$389,301	\$389,301
Open Access Non-nearshore	\$314,563	\$314,563	\$314,563	\$393,618	\$393,618	\$246,114
	Total Cost Net Revenue By Fishery as a Percentage of Gross Revenue					
Shoreside Whiting						
Non-whiting Trawl	32%	31%	31%	31%	31%	31%
Non-whiting Fixed Gear	18%	18%	17%	18%	17%	17%
LE Fixed Gear	18%	18%	18%	19%	19%	19%
Open Access Nearshore	9%	9%	9%	9%	9%	9%
Open Access Non-nearshore	7%	7%	7%	9%	9%	5%

Table 4-100. Estimates of costs by fishery for the alternatives.

Variable Cost By Fishery						
Fishery	2017			2018		
	No Action	Alt 1	Alt 2	No Action	Alt 1	Alt 2
Shoreside Whiting						
Non-whiting Trawl	\$18,177,857	\$20,846,706	\$20,798,399	\$18,168,880	\$20,638,621	\$20,595,627
Non-whiting Fixed Gear	\$3,742,005	\$3,763,414	\$3,780,263	\$3,874,319	\$3,895,924	\$3,910,920
LE Fixed Gear	\$10,680,386	\$10,680,386	\$10,680,386	\$11,103,673	\$11,103,673	\$10,207,156
Open Access Nearshore	\$2,279,332	\$2,279,332	\$2,279,332	\$2,279,332	\$2,279,332	\$2,279,332
Open Access Non-nearshore	\$2,360,048	\$2,360,048	\$2,360,048	\$2,445,168	\$2,445,168	\$2,445,168
Fixed Cost By Fishery						
Shoreside Whiting						
Non-whiting Trawl	\$4,552,349	\$4,552,349	\$4,552,349	\$4,552,349	\$4,552,349	\$4,552,349
Non-whiting Fixed Gear	\$1,146,652	\$1,146,652	\$1,146,652	\$1,146,652	\$1,146,652	\$1,146,652
LE Fixed Gear	\$2,463,966	\$2,463,966	\$2,463,966	\$2,463,966	\$2,463,966	\$2,463,966
Open Access Nearshore	\$1,903,445	\$1,903,445	\$1,903,445	\$1,903,445	\$1,903,445	\$1,903,445
Open Access Non-nearshore	\$1,696,425	\$1,696,425	\$1,696,425	\$1,696,425	\$1,696,425	\$1,696,425
Total Cost By Fishery						
Shoreside Whiting						
Non-whiting Trawl	\$22,730,206	\$25,399,055	\$25,350,748	\$22,721,229	\$25,190,970	\$25,147,976
Non-whiting Fixed Gear	\$4,888,657	\$4,910,066	\$4,926,915	\$5,020,971	\$5,042,576	\$5,057,572
LE Fixed Gear	\$13,144,352	\$13,144,352	\$13,144,352	\$13,567,639	\$13,567,639	\$13,567,639
Open Access Nearshore	\$4,182,777	\$4,182,777	\$4,182,777	\$4,182,777	\$4,182,777	\$4,182,777
Open Access Non-nearshore	\$4,056,473	\$4,056,473	\$4,056,473	\$4,141,593	\$4,141,593	\$3,793,672

4.2.3 Communities: Change in Income and Employment Impacts by Community

Socioeconomic impacts to fishing communities engaged in the groundfish fishery are evaluated based on the change in personal income (income impacts) and employment-related measures under the alternatives. These effects are a function of the projected changes in commercial and recreational fishing activity described above. Comparisons are with respect to the No Action Alternative. Impacts were estimated using NWFSC IOPAC input-output model, and they convey combined direct, indirect, and induced economic effects resulting from projected changes in recreational angling, commercial fishing, fish processing, and related input supply and support activities.

For simplification and ease of combining and comparing impacts from commercial and recreational fishing activities, coastal ports are grouped regionally. For a description of the counties included in these regions see page 378 in the 2015 EIS.

Commercial fishery and recreational fishery impacts are calculated and displayed separately. Impacts are calculated by applying income and employment multipliers generated using IOPAC regional impact models to the projected levels of local expenditures by commercial harvesters, processors, and recreational anglers under the alternatives.

Income and employment impacts from Pacific whiting caught in the at-sea catcher-processor and mothership sectors are not included in these totals. Most of the associated income and employment impacts would likely accrue in the Seattle region.

Economic impact models like IOPAC are calibrated to represent a baseline or “snapshot” of the economy at a particular point in time. Consequently these models are best able to address impacts of scenarios that are within the realm of what may have occurred over the past five to ten years. Analysis of scenarios that represent particularly large departures from baseline conditions may, therefore, result in biased impact estimates.

4.2.3.1 Income Impacts

Table 4-101 presents estimates of personal income by region due to projected commercial groundfish fishing activity under the Alternatives. Table 4-102 and Table 4-103 compare this information relative to No Action. Table 4-104 presents the estimated income impacts resulting from recreational groundfish fisheries with Table 4-105 and Table 4-106 presenting the estimates relative to No Action. As with the angler trip estimates presented above, recreational income impacts are presented in terms of the five management option scenarios that reflect different approaches to recreational fishery management in Washington and California. (See Sections 4.1.1 through 4.1.3 for a description of these management options.)

Commercial fishery income impacts:

- Coastwide estimated personal income from commercial groundfish fishing ranges from \$124 million under No Action to \$136 million under Alternatives 1 and 2.
- Oregon accounts for 61 percent of coastwide personal income and also shows the largest relative increases in income compared to No Action. This is because the bulk of commercial revenue comes from the IFQ fishery, which is concentrated in Oregon (and southern Washington coast) ports. In relative terms Oregon communities show a 14 percent increase from No Action under the action alternatives, or \$10.6-\$10.9 million.

- California accounts for a quarter of coastwide income, most of this occurring in the two Northern California regions. There is no change in personal income impacts in California across the alternatives. Income impacts are reported to the nearest \$100,000; the +/- signs before zero values in Table 4-102 and Table 4-103 indicate changes less than this reporting threshold.
- Washington Coast communities would realize around \$1 million more income under the action alternatives compared to No Action, while Puget Sound shows no change.

Table 4-101. Commercial fishery income impacts under the alternatives by community group (\$mil) in 2017-2018. Estimates are presented as the average annual value for the two-year management period.

Community Groups	No Action	Alternative 1	Alternative 2
Puget Sound	4.4	4.4	4.4
Washington Coast	13.4	14.4	14.4
Astoria-Tillamook	44.0	52.8	52.6
Newport	15.8	18.1	18.0
Coos Bay-Brookings	15.8	15.7	15.6
Crescent City-Eureka	9.3	9.3	9.3
Fort Bragg – Bodega Bay	8.8	8.8	8.8
San Francisco Area	2.3	2.3	2.3
SC – Mo – MB	6.3	6.3	6.3
SB – LA – SD	4.0	4.0	4.0
Coastwide Total	124.0	136.0	136.0

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-102. Change in commercial fishery income impacts (from No Action Alternative) under the action alternatives by community group (\$mil) in 2017-2018. Estimates are presented as the average annual value for the two-year management period.

Community Groups	No Action	Alternative 1	Alternative 2
Puget Sound	4.4	-0.0	-0.0
Washington Coast	13.4	+1.1	+1.0
Astoria-Tillamook	44.0	+8.8	+8.6
Newport	15.8	+2.2	+2.2
Coos Bay-Brookings	15.8	-0.1	-0.1
Crescent City-Eureka	9.3	-0.0	-0.0
Fort Bragg – Bodega Bay	8.8	+0.0	+0.0
San Francisco Area	2.3	-0.0	-0.0
SC – Mo – MB	6.3	+0.0	+0.0
SB – LA – SD	4.0	+0.0	+0.0
Coastwide Total	124.0	+12.0	+12.0

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-103. Change in commercial fishery income impacts (from No Action Alternative) under the action alternatives by community group (percent).

Community Groups	No Action	Alternative 1	Alternative 2
	Puget Sound	4.4	-0.0%
Washington Coast	13.4	+7.9%	+7.5%
Astoria-Tillamook	44.0	+19.9%	+19.6%
Newport	15.8	+14.1%	+13.8%
Coos Bay-Brookings	15.8	-0.4%	-0.4%
Crescent City-Eureka	9.3	-0.0%	-0.0%
Fort Bragg – Bodega Bay	8.8	+0.0%	+0.0%
San Francisco Area	2.3	-0.0%	-0.0%
SC – Mo – MB	6.3	+0.0%	+0.0%
SB – LA – SD	4.0	+0.0%	+0.0%
Coastwide Total	124.0	+9.7%	+9.7%

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Recreational fishery income impacts:

- Coastwide, income impacts vary slightly across the alternatives/options scenarios with the exception of California Option 4. Except for the California Option 4 scenario, coastwide income under the management scenarios is estimated at approximately \$236 million. Under Option 4 coastwide income would be considerably less at \$119 million. All of the differences occur in California regions.
- In relative terms, Northern California shows a 15 percent increase under California Option 2 under the action alternatives, or \$929,000.
- All California regions show declines from No Action under California Option 4 ranging from about \$96 million in the Santa Barbara to San Diego region to \$542,000 in the Fort Bragg-Bodega Bay region.
- No change from No Action is estimated for California Options 1 and 3.
- The Washington Season Option would result in a small, \$12,000 reduction in income compared to No Action.

Table 4-104. Recreational fishery income impacts of the alternatives and recreational management options by community group (\$1,000s).

	<i>No Action (\$,000)</i>	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-
Washington Coast	5,826	5,826	5,826	5,826	5,826	5,814
Astoria-Tillamook	1,512	1,512	1,512	1,512	1,512	1,512
Newport	6,820	6,820	6,820	6,820	6,820	6,820
Coos Bay-Brookings	2,809	2,809	2,809	2,809	2,809	2,809
Crescent City-Eureka	3,506	3,506	3,506	4,370	2,642	3,506
Fort Bragg - Bodega Bay	2,894	2,894	2,894	2,958	2,352	2,894
San Francisco Area	20,891	20,891	20,891	20,891	10,679	20,891
SC – Mo – MB	20,046	20,046	20,046	20,046	10,827	20,046
SB – LA – SD	171,552	171,552	171,552	171,552	75,845	171,552
Coastwide Total	235,856	235,856	235,856	236,784	119,312	235,844

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-105. Change in recreational fishery income impacts from No Action under the action alternatives by community group (\$1,000s).

Community Groups	No Action (\$,000)	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-
Washington Coast	5,826	-	-	-	-	-12
Astoria-Tillamook	1,512	-	-	-	-	-
Newport	6,820	-	-	-	-	-
Coos Bay-Brookings	2,809	-	-	-	-	-
Crescent City-Eureka	3,506	-	-	+864	-864	-
Fort Bragg - Bodega Bay	2,894	-	-	+65	-542	-
San Francisco Area	20,891	-	-	-	-10,212	-
SC – Mo – MB*	20,046	-	-	-	-9,219	-
SB – LA – SD*	171,552	-	-	-	-95,707	-
Coastwide Total	235,856	-	-	+929	-116,544	-12

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-106. Change in recreational fishery income impacts from No Action under the action alternatives by community group (percent).

Community Groups	No Action (\$,000)	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-
Washington Coast	5,826	-	-	-	-	-0.2%
Astoria-Tillamook	1,512	-	-	-	-	-
Newport	6,820	-	-	-	-	-
Coos Bay-Brookings	2,809	-	-	-	-	-
Crescent City-Eureka	3,506	-	-	+24.7%	-24.6%	-
Fort Bragg - Bodega Bay	2,894	-	-	+2.2%	-18.7%	-
San Francisco Area	20,891	-	-	-	-48.9%	-
SC – Mo – MB*	20,046	-	-	-	-46.0%	-
SB – LA – SD*	171,552	-	-	-	-55.8%	-
Coastwide Total	235,856	-	-	+0.4%	-49.4%	-0.0%

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.3.2 Employment Impacts

Table 4-107 shows projected employment impacts due to the commercial groundfish fishery under the alternatives; Table 4-108 and Table 4-109 show the impacts relative to No Action. Table 4-110 shows projected employment impacts due to the recreational groundfish under the alternatives; Table 4-111 and Table 4-112 show the impacts relative to No Action.

Commercial fishery employment impacts:

- No Action is expected to result in 1,998 jobs; both action alternatives would result in higher employment, with Alternative 1 resulting in 2,138 jobs and 2,136 jobs for Alternative 2.
- Similar to income, the largest job increases under the action alternatives are expected on the Washington Coast and Oregon communities. Southern Oregon and California communities for the most part show fewer resulting jobs impacts compared to No Action. Alternative 2 would result in 2 fewer jobs in this region compared to No Action; Alternative 1 would result in one less job.
- Under No Action 55 percent of jobs are associated with Oregon ports, 33 percent in California, and 12 percent in Washington.
- Compared to No Action, under Alternative 1 jobs in Oregon would increase by 127, in California decline by one job, and in Washington increase by 14 jobs.
- Compared to No Action, under Alternative 2 jobs in Oregon would increase by 125, in California decline by two jobs, and in Washington increase by 13 jobs.

Recreational fishery employment impacts:

- Under No Action 3,372 jobs would result. The differences among the alternatives are relatively small (with the exception of under California Option 4).
- California Option 4 is estimated to result in 1,743 fewer jobs—about half the number under No Action. Most of this difference from No Action would occur in Southern California.

Table 4-107. Commercial fishery employment impacts under the alternatives by community group (number of jobs).

Community Groups	No Action	Alternative 1	Alternative 2
Puget Sound	49	49	49
Washington Coast	181	195	194
Astoria-Tillamook	551	654	650
Newport	219	244	239
Coos Bay-Brookings	331	330	329
Crescent City-Eureka	152	152	152
Fort Bragg – Bodega Bay	164	164	163
San Francisco Area	47	47	46
SC – Mo – MB	203	204	204
SB – LA – SD	101	101	101
Coastwide Total	1,998	2,138	2,136

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-108. Change in commercial fishery employment impacts (from No Action Alternative) under the action alternatives by community group (number of jobs).

Community Groups	No Action	Alternative 1	Alternative 2
Puget Sound	49	-0.0	-0.0
Washington Coast	181	+13.5	+13.4
Astoria-Tillamook	551	+103.4	+101.9
Newport	219	+25.0	+24.9
Coos Bay-Brookings	331	-1.1	-1.5
Crescent City-Eureka	152	-0.3	-0.4
Fort Bragg – Bodega Bay	164	+0.0	-0.2
San Francisco Area	47	-0.1	-0.1
SC – Mo – MB	203	+0.3	+0.3
SB – LA – SD	101	+0.0	+0.0
Coastwide Total	1,998	+140.8	+138.3

Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-109. Change in commercial fishery employment impacts (from No Action Alternative) under the action alternatives by community group (percent).

Community Groups	No Action	Alternative 1	Alternative 2
Puget Sound	49	-0.0%	-0.0%
Washington Coast	181	+7.5%	+7.4%
Astoria-Tillamook	551	+18.8%	+18.5%
Newport	219	+11.4%	+11.4%
Coos Bay-Brookings	331	-0.3%	-0.5%
Crescent City-Eureka	152	-0.2%	-0.3%
Fort Bragg – Bodega Bay	164	+0.0%	-0.2%
San Francisco Area	47	-0.1%	-0.2%
SC – Mo – MB	203	+0.2%	+0.2%
SB – LA – SD	101	+0.0%	+0.0%
Coastwide Total	1,998	+7.0%	+6.9%

Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-110. Recreational fishery employment impacts under the alternatives and recreational management options by community group (number of jobs).

Community Groups	<i>No Action</i>	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-
Washington Coast	161	161	161	161	161	161
Astoria-Tillamook	42	42	42	42	42	42
Newport	174	174	174	174	174	174
Coos Bay-Brookings	74	74	74	74	74	74
Crescent City-Eureka	57	57	57	71	43	57
Fort Bragg - Bodega Bay	47	47	47	48	38	47
San Francisco Area	283	283	283	283	145	283
SC – Mo – MB*	336	336	336	336	181	336
SB – LA – SD*	2,558	2,558	2,558	2,558	1,131	2,558
Coastwide Total	3,732	3,732	3,732	3,748	1,989	3,732

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-111. Change in recreational fishery employment impacts from No Action under the action alternatives by community group (number of jobs).

Community Groups	<i>No Action</i>	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-
Washington Coast	161	-	-	-	-	-0
Astoria-Tillamook	42	-	-	-	-	-
Newport	174	-	-	-	-	-
Coos Bay-Brookings	74	-	-	-	-	-
Crescent City-Eureka	57	-	-	+14	-14	-
Fort Bragg - Bodega Bay	47	-	-	+1	-9	-
San Francisco Area	283	-	-	-	-139	-
SC – Mo – MB*	336	-	-	-	-154	-
SB – LA – SD*	2,558	-	-	-	-1,427	-
Coastwide Total	3,732	-	-	+15	-1,743	-0

Note: SC – Mo – MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

Table 4-112. Change in recreational fishery employment impacts from No Action under the action alternatives by community group (percent).

Community Groups	<i>No Action</i>	Alternative 1 (CA Ops 1 and 3)	Alternative 2 (CA Ops 1 and 3)	Alternatives 1 and 2 (CA Op 2)	Alternatives 1 and 2 (CA Op 4)	Alternative 1 (CA Ops 1 and 3) + WA Groundfish Season Alt
Puget Sound	-	-	-	-	-	-
Washington Coast	161	-	-	-	-	-0.1%
Astoria-Tillamook	42	-	-	-	-	-
Newport	174	-	-	-	-	-
Coos Bay-Brookings	74	-	-	-	-	-
Crescent City-Eureka	57	-	-	+24.7%	-24.6%	-
Fort Bragg - Bodega Bay	47	-	-	+2.2%	-18.7%	-
San Francisco Area	283	-	-	-	-48.9%	-
SC – Mo – MB*	336	-	-	-	-46.0%	-
SB – LA – SD*	2,558	-	-	-	-55.8%	-
Coastwide Total	3,732	-	-	+0.4%	-46.7%	-0.0%

Note: SC – Mo –MB: Santa Cruz – Monterey – Morro Bay; SB – LA – SD: Santa Barbara – Los Angeles – San Diego.

4.2.3.3 Other Impacts

The 2015 EIS (PFMC and NMFS 2015) discusses other socioeconomic impacts. Impacts to processors can be inferred from commercial ex-vessel revenue estimates, which represent processor purchases. Quantitatively, the dollar values in Table 4-90 represent these purchases and the relative impacts are the same as described above in Section 4.2.1.1.

The 2015 EIS also briefly discusses effects related to non-market and non-use (NMNU) values. These are non-consumptive uses that range from recreational enjoyment of the environment (e.g., wildlife viewing) to option or existence value (benefit derived from the knowledge that these resources will be available in the future or simply that environmental quality is maintained). However, it is not possible to quantify how the proposed action would affect these values. Generally speaking, the proposed action must comply with MSA National Standards and the goals and objectives enumerated in the FMP. All of the alternatives are consistent with the resulting harvest management framework, which has as its goal maintaining stocks at their target biomasses. This goal may support realization of NMNU values.

Fishery management regulations can indirectly affect vessel safety, either because of disinvestment by vessel operators due to low revenue or incentives that causes them to go out in hazardous weather. No regulatory changes under the proposed action have been identified that would have a substantial impact on these factors. Furthermore, much of the groundfish fishery has transitioned to catch shares management either through the IFQ program, co-ops for the at-sea Pacific whiting fishery, or individual vessel allocations in the limited entry fixed gear sablefish fishery. A study reported to the Council in the 2015 State of the California Current Report (Agenda Item E.1.b, NMFS Report 2, March 2015) found that the transition to catch shares reduced the probability of a fisherman taking a fishing trip on a high wind day.

Management of the fishery may also affect human wellbeing but it is very difficult to directly measure these effects. NOAA's California Current Integrated Ecosystem Assessment program has been developing indicators of human wellbeing, which are reported to the Council annually in the aforementioned report. Past EISs, including the 2015 EIS, have also presented demographic data and assessment of community vulnerability to represent wellbeing. While this information can help distinguish among communities in terms of their status, the effect of the alternatives wellbeing can only be inferred from projected changes in personal income in communities.

4.2.3.4 Impact Summary

It is important to note that the commercial and recreational impact estimates are not necessarily comparable. The underlying assumption in both the commercial and recreational impact estimates is that there is no substitution for either activity. On the commercial side, if a management alternative reduces groundfish landings, vessels have no ability to substitute towards some other fishing opportunity, nor do they have an ability to substitute towards some other non-fishing occupation such as agriculture, construction, education, hospitality, etc. Likewise, on the commercial side, processors have no ability to substitute towards some other source of fish in the production process such as foreign or Alaska imports, nor do processors have ability to substitute towards non-fishing opportunities. On the recreational side, the underlying assumption is that anglers participating in recreational fishing have no other recreational substitution possibilities within the region. If a management alternative reduces the number of angler trips for groundfish, there is no ability for anglers to substitute towards some other fishing activity such as targeting tuna or salmon, nor is there an ability to substitute towards some other non-fishing related activity such as scuba diving, camping, etc. The underlying assumption is that if recreational groundfish trips are reduced, then all spending by anglers for food, fuel, tackle, etc. related to these trips would essentially leave the region. Currently, there is a dearth of information about the likelihood with which commercial anglers would substitute towards some other business opportunity, and the same is true for the likelihood of substitution by recreational anglers.

Nevertheless, it is not unreasonable to expect that recreational anglers may more easily substitute towards some other recreational opportunity than commercial anglers can find new business opportunities. Consequently, caution should be used in direct comparison between commercial and recreational impacts.

Recognizing the caveats discussed above, Table 4-113, Table 4-114, and Table 4-115 display recreational and commercial income impacts for the No Action Alternative, Alternative 1, and Alternative 2 side by side. These tables also show the relative share of commercial versus recreational income impacts by community.

- The **No Action Alternative** is estimated to result in \$236 million in recreational income impacts and \$124 million in commercial impacts.
- **Alternative 1**, with California recreational Options 1 or 3, is estimated to result in \$236 million in recreational income impacts—the same as No Action—and \$136 million in commercial impacts.
- **Alternative 2**, with California recreational Options 1 or 3, is estimated to result in \$236 million in recreational income impacts—the same as No Action—and \$136 million in commercial impacts.

The difference between the alternatives as measured by commercial fishery ex-vessel revenue occur in the shoreside IFQ fishery.

The recreational fishery is a major contributor to coastwide personal income. Taking the no action alternative as an example, \$172 million in recreational income impacts is occurs in the Santa Barbara to San Diego region. More generally, the recreational fishery accounts for the vast majority of income impacts in communities from San Francisco to San Diego. This is a function of both the large income impacts from recreational fishing and the relatively small income impacts derived from commercial fishing. The reverse is true for more northerly communities.

California recreational management Option 4 shows the biggest difference with respect recreational fishery income impacts. Based on Table 4-104, California Option 4 would result in \$118 million less personal income compared to California Option 2 under either action alternative, representing a large proportion of the coastwide combined personal income impacts under any of the alternatives.

Table 4-113. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under the No Action Alternative.

Community	Recreational		Commercial	
	Income (\$million)	Share of Coastwide Income	Income (\$million)	Share of Coastwide Income
Puget Sound	\$0.0	0%	\$4.4	4%
Washington Coast	\$5.8	2%	\$13.4	11%
Astoria-Tillamook	\$1.5	1%	\$44.0	35%
Newport	\$6.8	3%	\$15.8	13%
Coos Bay-Brookings	\$2.8	1%	\$15.8	13%
Crescent City-Eureka	\$3.5	1%	\$9.3	8%
Ft. Bragg - Bodega Bay	\$2.9	1%	\$8.8	7%
San Francisco Area	\$20.9	9%	\$2.3	2%
SC – Mo – MB*	\$20.0	8%	\$6.3	5%
SB – LA – SD*	\$171.6	73%	\$4.0	3%
Coastwide Total	\$235.9	100%	\$124.0	100%

Table 4-114. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under Alternative 1 (California Options 1 and 3).

Community	Recreational		Commercial	
	Income (\$million)	Share of Coastwide Income	Income (\$million)	Share of Coastwide Income
Puget Sound	\$0.0	0%	\$4.4	100%
Washington Coast	\$5.8	2%	\$14.4	71%
Astoria-Tillamook	\$1.5	1%	\$52.8	97%
Newport	\$6.8	3%	\$18.1	73%
Coos Bay-Brookings	\$2.8	1%	\$15.7	85%
Crescent City-Eureka	\$3.5	1%	\$9.3	73%
Ft Bragg - Bodega Bay	\$2.9	1%	\$8.8	75%
San Francisco Area	\$20.9	9%	\$2.3	10%
SC – Mo – MB*	\$20.0	8%	\$6.3	24%
SB – LA – SD*	\$171.6	73%	\$4.0	2%
Coastwide Total	\$235.9	100%	\$136.0	37%

Table 4-115. Comparison of projected personal income from recreational and commercial groundfish fisheries by community group under Alternative 2 (California Options 1 and 3).

Community	Recreational		Commercial	
	Income (\$million)	Share of Coastwide Income	Income (\$million)	Share of Coastwide Income
Puget Sound	\$0.0	0%	\$4.4	3%
Washington Coast	\$5.8	29%	\$14.4	11%
Astoria-Tillamook	\$1.5	3%	\$52.8	39%
Newport	\$6.8	27%	\$18.1	13%
Coos Bay-Brookings	\$2.8	15%	\$15.7	12%
Crescent City-Eureka	\$3.5	28%	\$9.3	7%
Ft Bragg - Bodega Bay	\$2.9	25%	\$8.8	6%
San Francisco Area	\$20.9	90%	\$2.3	2%
SC – Mo – MB*	\$20.0	77%	\$6.3	5%
SB – LA – SD*	\$171.6	98%	\$4.0	3%
Coastwide Total	\$235.9	64%	\$135.9	100%

5. Cumulative Effects

The purpose of a cumulative effects analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful.

The EIS for 2015-2016 harvest specifications and management measures and Amendment 24 (PFMC and NMFS 2015) includes an analysis of the cumulative effects of biennial management under the PCGFMP framework.¹⁰ That EIS addresses the significance of the expected cumulative impacts as they relate to the federally-managed groundfish fishery. This analysis is incorporated by reference and summarized here. New information indicating potential changes in cumulative effects is also presented.

5.1 Scope of Cumulative Effects

Affected resources are described in Chapter 3 of the 2015 EIS. Updated information may be found in the 2016 Groundfish SAFE document. The geographic scope of these affected resources is the EEZ off Washington, Oregon, and California and fishing communities participating the groundfish fishery. The temporal scope of the cumulative effects analysis in the 2015 EIS includes past and actions having continuing effects on the resources within the scope of the proposed actions and reasonably foreseeable future actions affecting resources within the scope of the proposed actions. Since the proposed actions evaluated in the 2015 EIS includes the management framework described in the PCGFMP as amended by Amendment 24, the same geographic and temporal scope applies to the current proposed actions.

5.2 Effects of Past, Present, and Reasonably Foreseeable Future Actions Other than the Proposed Actions

5.2.1 Fishery-Related

The EIS identifies and describes fishery management actions contributing to cumulative effects: 1) past groundfish harvest specifications and management measures, 2) review of groundfish essential fish habitat designation and mitigation measures, 3) the Council's Fishery Ecosystem Plan, 4) regulatory adjustments to the trawl rationalization program, 5) seabird avoidance measures, and 6) regulation of fisheries for species other than groundfish. These actions have progressed since the 2015 EIS was prepared. Information on regulatory implementation of actions in these categories and initiation of new actions can be found on the NMFS WCR website and the Council's website. Another source of information for ongoing actions is Agenda Item I.1.a, NMFS Report 1 (November 2015, which presents NMFS's rulemaking plan for 2015-2016 for groundfish and halibut fisheries. These actions are briefly summarized below.

Regulations for the 2015-2016 harvest specifications and management measures were implemented in early 2015. NMFS also established a process to allow the fishery to proceed before the regulations came into force. Various other regulatory actions established Pacific whiting and Pacific halibut allocations and inseason management to achieve ACLs. Other measures of a primarily technical nature, such as specifications for VMS and regulations for midwater trawl fisheries, were implemented. The Council is considering authorizing a new midwater recreational fishery off Oregon, which would be managed under the biennial process. In addition, Amendment 24 to the PCGFMP was approved.

¹⁰ This EIS is available at <http://www.westcoast.fisheries.noaa.gov/publications/nepa/groundfish/1516spexfeis.pdf>.

The trawl rationalization program (shoreside IFQ and at-sea co-ops) is subject to ongoing regulatory actions that are technical fixes, intended to make the program function more efficiently, or address allocations affecting IFQ. These measures include fishery monitoring measures, and divestiture of excess IFQ.

The National Marine Fisheries Service (NMFS) has developed a preliminary draft environmental impact statement (EIS), evaluating proposed changes to gear requirements in the trawl catch share program. The EIS covers a suite of eight gear issues, as follows: (1) minimum mesh sizes, (2) measuring mesh size, (3) codend regulations, (4) selective flatfish trawl, (5) chafing gear, (6) multiple gears on board, (7) fishing in multiple management areas, and (8) fishing before previous catch is stowed. The purpose of this action is to provide more flexibility in the configuration and use of gear for participants in the trawl rationalization program, while at the same time ensuring that conservation objectives are met. Such flexibility is expected to foster innovation and allow for more optimal harvest operations. Benefits may include increased efficiency through reduced costs and increased revenues. The Council chose a final preferred alternative for this action at its March 2016 meeting.

Various proposals related to fishery monitoring are in the implementation phase or under Council consideration. These include a rulemaking to implement an electronic monitoring (EM) program for the limited entry (LE) midwater trawl vessel in the Pacific whiting fishery that fish in the mothership and Shorebased IFQ Program, and an EM program for LE trawl vessels that use fixed gear to harvest fish under the Shorebased IFQ program. In addition, the Council is considering new requirements to monitor vessel movements, and continuing to develop an electronic monitoring program for the non-whiting midwater trawl and bottom trawl fisheries under the Shorebased IFQ Program.

The Seabird Avoidance Program for the Pacific coast groundfish fishery became effective December 18, 2015 (80 FR 71975). This imposes a streamer line requirement for fixed gear fisheries.

Comprehensive Ecosystem Based Amendment 1 was approved on March 10, 2016, and pursuant regulations became effective on April YY. These measures prevent the development of fisheries targeting certain forage species without first undergoing a careful review in the Council process. Incidental landings of these species in currently authorized fisheries is also limited.

NMFS is also evaluating the effect of the groundfish fishery on ESA-listed salmonids. In April, June, and September 2015 and March 2016 NMFS briefed the Council on elements to be considered in the consultation including mitigation measures. The consultation may be completed before or during the 2017-2018 management period. New mitigation measures could be implemented. The USFWS intends to reinitiate section 7 consultation on the effects of the groundfish fishery on the endangered short-tail albatross, and following recommendation from the Council's ESA Workgroup, NMFS will be reinitiating consultation on eulachon for the groundfish fishery.

NMFS expects to implement regulations in 2016 to define which Pacific whiting landings count towards IFQ holdings and divestiture. Also in 2016, regulations related to the sablefish fixed gear fishery are planned for implemented. This includes allowing joint registration of a vessel to both a limited entry trawl and fixed gear permit endorsements, allowing IFQ and fixed gear vessel allocations to be fished simultaneously.

5.2.2 Not Fishery-Related

The 2015 EIS identified the following actions not related to fishing that could contribute to the cumulative effects of the proposed action: water pollution, other authorities to conserve biological resources affected by the proposed action, and cyclical and ongoing climate change. Potential climate change effects are described as part of the affected environment in Chapter 3 of the 2015 EIS. Range shifts of target species may cause the biggest climate change-related impact on fisheries in the foreseeable future. No other non-

fishing actions discernably affecting the resources within the scope of the proposed action have been subsequently identified.

5.2.3 Summary of Effects of Past, Present, and Reasonably Foreseeable Future Actions not Identified in the 2015 EIS

The 2015 EIS evaluated direct, indirect, and cumulative effects to the following environmental components:

- Groundfish Stocks
- Socioeconomic Environment
- Essential Fish Habitat
- California Current Ecosystem
- Protected Species
- Non-groundfish Species

Table 5-1 and Table 5-2 are excerpted from see Section 4.15.6 in the 2015 EIS. Table 5-1 summarizes the effects of past, present and reasonably foreseeable future actions and Table 5-2 summarizes the cumulative, or combined effects, of the action and the other external actions. The effects summarized in these tables are relevant to the current proposed action.

Table 5-1. Summary effects of past, present, and reasonably foreseeable future actions on the environmental components evaluated in the 2015-2016 Groundfish Harvest Specifications EIS (Table 4-234).

Environmental Component	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Groundfish Stocks	Mixed (Low Positive and Low Negative) Most stocks above or near target biomass; however, some stocks remain overfished	Low to Moderate Positive The current management framework is effective in rebuilding stocks to the target biomass and achieving optimum yield	Low Positive No actions are identified that would reduce the effectiveness of the management framework	Low Positive No actions are identified that would reduce the effectiveness of the management framework; however misspecification of catch limits and management error could occur; climate change may reduce local abundance
Socioeconomic (Human Communities)	Mixed (Low Positive and Low Negative) Fishery resources have supported profitable industries but management measures associated with stock rebuilding have curtailed fishing opportunities; trawl rationalization increased operational flexibility	Mixed (Low Positive and Low Negative) Stock status and yield have allowed fishery revenues to increase; falling participation and agglomeration may concentrate revenues in fewer communities	Low Positive No actions are identified that would accelerate falling participation and agglomeration	Low to Moderate Positive Stock status and yield have allowed fishery revenues to increase; falling participation and agglomeration may concentrate revenues in fewer communities
Essential Fish Habitat	Low to Moderate Positive Evidence suggests that trawl fishing effort is falling; past actions have mitigated adverse effects of fishing on EFH	Mixed (Low Positive and Low Negative) Trawl fishing effort stable; ongoing actions continue to mitigate adverse effects of fishing on EFH; Trawl RCA boundary change proposed	Low Positive Trawl fishing effort not likely to increase; future actions likely to enhance the mitigation of adverse effects of fishing on EFH	Low to Moderate Positive Trawl fishing effort not likely to increase; future actions likely to enhance the mitigation of adverse effects of fishing on EFH
California Current Ecosystem	Mixed (Low Positive and Low Negative) Based on simulations, the development of fisheries has had both positive and negative indirect effects on ecosystem attributes	Neutral Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; other actions likely have negligible impacts	Mixed (Low Positive and Low Negative) Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; climate change likely to have moderate to substantial impacts	Neutral Ongoing prosecution of fisheries at current levels not expected to change ecosystem attributes from the baseline; climate change likely to have moderate to substantial impacts

Table 5-1 (continued). Summary effects of past, present, and reasonably foreseeable future actions on the environmental components evaluated in the 2015-2016 Groundfish Harvest Specifications EIS.

Environmental Component	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Protected Species	Mixed (Low Positive and Low Negative) Protected species take modest in groundfish fisheries and documented through observer program; requirements of ESA, and MMPA implemented	Low Positive Most populations increasing; ESA and MMPA mitigation addressed and ongoing	Low Positive Most populations increasing; future adverse effects likely to be addressed through ESA and MMPA	Low Positive Most populations increasing; adverse effects likely to be addressed through ESA and MMPA
Non-groundfish Species	Neutral Bycatch in groundfish fisheries is negligible	Neutral Bycatch in groundfish fisheries is negligible	Neutral Bycatch in groundfish fisheries is negligible	Neutral Bycatch in groundfish fisheries is negligible

Table 5-2. Summary of the cumulative effects of the proposed actions in the 2015-2016 Groundfish Harvest Specifications EIS (Table 4 235).

Affected Resources	Baseline*	Past, Present, and Reasonably Foreseeable Future Actions	2015-2016 Harvest Specifications and Management Measures	Amendment 24 Proposed Action	Cumulative Effects
Groundfish Stocks	Low to Moderate Positive (Section 3.1)	Low Positive	Low Positive	Neutral	Low Positive
Human Communities	Mixed (Low Positive and Low Negative) Section 3.2)	Mixed (Low to Moderate Positive)	Low Positive	Mixed (Low Positive and Low Negative)	Low Positive
Essential Fish Habitat	Low to Moderate Positive (Section 3.3)	Low Moderate Positive	Mixed (Low Positive and Low Negative)	Neutral	Low to Moderate Positive
California Current Ecosystem	Neutral (Section 3.4)	Neutral	Neutral	Neutral	Neutral
Protected Species	Low Positive (Section 3.5)	Low Positive	Neutral	Neutral	Low Positive
Non-Groundfish Stocks	Neutral (Section 3.6)	Neutral	Neutral	Neutral	Neutral

* Although the temporal scope of past and present actions for the affected resources encompasses actions that occurred after FMP implementation (1982), the baseline period is 2003 to 2012, which is the temporal context within which affected resources are described in Chapter 3.

The 2015 EIS concluded that cumulative effects to these environmental components ranged from neutral to moderately positive. The direct and indirect effects of the current proposed actions are disclosed and discussed in Sections 2 through 3 of this document. Those effects are within the scope of those identified for setting harvest specifications and implementing related management measures consistent with the PCGFMP framework as analyzed in the 2015 EIS. The description of actions other than the proposed actions as updated above indicates that the context and intensity of resulting impacts are not substantially different than what was disclosed in the 2015 EIS.

6. Consistency of the Proposed Actions with the Magnuson-Stevens Act 10 National Standards for Fishery Conservation and Management

An FMP or plan amendment and any pursuant regulations must be consistent with ten national standards contained in the MSA (§301). These are described below.

National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the United States fishing industry.

MSA section 303(a)(3) requires that each FMP include an estimate of MSY and OY for the fishery. OY is the amount of fish that will provide the greatest overall benefit to the U.S., particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems. OY is prescribed as such on the basis of the MSY from the fishery as reduced by any relevant economic, social, or ecological factor; and in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery. The harvest specification action alternatives are consistent with the OY harvest management framework described in Chapter 4 of the Groundfish FMP. The FMP Chapter 4 describes OY as “a decisional mechanism for resolving the Magnuson Stevens Act’s multiple purposes and policies, implementing an FMP’s objectives and balancing the various interests that comprise the national welfare.” The OYs are based on MSY or MSY as reduced in consideration of social, economic, or ecological factors. The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing (50 CFR Section 600.310(b)). In establishing OYs, the interim step of calculating OFLs, ABC, and ACLs is taken (FMP Section 4.1). OFL is the MSY harvest levels associated with the current stock abundance. Over the long term, if OFLs are fully harvested, the average of the OFLs would be MSY. ABC is a threshold below the OFL, which accounts for scientific uncertainty in the estimate of OFL. ACL is a harvest specification set at or below ABC, and it is intended to prevent overfishing. The ACLs are established to achieve OY. The OY for a stock or stock complex is the long-term average of the stock or stock complex ACLs.

The OFL is the estimate of catch level above which overfishing is occurring, or the estimate of MFMT applied to a stock’s abundance. The ABC is a level of annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. Chapter 4 in the Groundfish FMP describes an ABC control rule; ABC values described in this document were determined following that control rule. The ACL is the level of annual catch that serves as the basis for invoking accountability measures. The ACL may equal, but may not exceed, the ABC. The ACL may be set lower than the ABC to account for a wide range of factors. The application of the OY harvest management framework to the specifications described in this document should result in ACLs that reduce the likelihood of overfishing.

Because of past overfishing, seven groundfish stocks are currently declared overfished. Widow rockfish was determined to be rebuilt in 2011 and was no longer managed under a rebuilding plan beginning in 2013. Petrale sole was declared overfished in 2010, based on a revision to the OY harvest management framework that incorporates estimates of B_{MSY} of $B_{25\%}$ and MSST of $B_{12.5\%}$ for flatfish. Petrale sole was rebuilt in 2015, but was managed under its rebuilding plan for the 2015-2016 biennial cycle. For the 2017-2018 period it is proposed to be managed under the default HCR and resulting specifications for healthy stocks. Canary rockfish was declared rebuilt in 2015 and will be managed according to [insert preferred HCR here] for the 2017-2018 period. The 2015 darkblotched rockfish assessment projects the stock will be rebuilt by the start of 2016 before new harvest specifications are

implemented in 2017. The Council considered continuing the rebuilding plan HCR into the next biennial period or implementing the default HCR for healthy stocks based on its rebuilt status [Insert preferred HCR here]

Bocaccio rockfish south of 40°10' N. lat., cowcod, Pacific ocean perch, and yelloweye rockfish are the remaining overfished species currently managed under the PCGMFP (assuming darkblotched is declared rebuilt in 2016). These stocks will be managed under the default HCRs specified in their rebuilding plans.

Section 304(e) introduces a tradeoff formulated as specifying a time to rebuild “as short as possible, taking into account the status and biology of any overfished stocks, the needs of fishing communities, ... and the interaction of the overfished stock of fish within the marine ecosystem...” The Council took into account this tradeoff for overfished stocks and, based on the best available science (the most recent stock assessment results), did not consider alternative HCRs for the four overfished stocks enumerated above.

National Standard 2 states that conservation and management measures shall be based on the best scientific information available.

The best available science standard applies to the following areas relative to this proposed action: stock assessments, rebuilding analyses, and methods for determining management reference points (OFL, ABC, ACL, etc.); these areas form the basis for determining harvest levels and the evaluation of socioeconomic impacts. The supporting science is discussed below.

The harvest specifications (specifically, ACLs) considered under the proposed action (the action alternatives, including the Preferred Alternative), are based on the most recent stock assessments, developed through the peer-review STAR process. As part of the management cycle, the Council recommends which stocks should be assessed in advance of current decision-making. Only a small proportion of the more than 80 managed groundfish species are regularly assessed, because of a combination of factors. For many stocks, there may not be enough data to support a full assessment (the FMP describes a classification system based on the availability of data). For unassessed stocks, proxy methods must be used to determine reference points. Stocks may be subjected to little or no fishing pressure, or determined to have low vulnerability, and, thus, be less in need of regular assessment.

Finally, there is a limit on the institutional resources needed to carry out the assessments (i.e., fishery scientists). In some cases, a previous assessment may be updated; this means that the underlying model is not reevaluated, but the model is re-run with the addition of more recent data from the period since the last full assessment. The 2016 Groundfish SAFE document reviews the basis for alternative harvest specifications and references the stock assessments that were used. It also describes the methods that were used to determine reference points for harvest specifications (OFL, ABC, ACL, etc.) for stocks and stock complexes.

The NWFSC has developed a model application, called IOPAC, for estimating personal income impacts of commercial fishing on the West Coast. This model is documented in Appendix A.

National Standard 3 states that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

Groundfish ACLs are set for management units, which include stocks, stock complexes, or geographic subdivisions thereof. Stock complexes group co-occurring species, many of which have not been formally assessed. The 2016 Groundfish SAFE document describes how ACLs for stock complexes are

developed, based on ABC estimates of component stocks. Stocks within these complexes are not managed individually for a variety of reasons including the lack of assessments, lack of reliable catch data at the species level, or the fact that they constitute a small portion of catches. If a stock within a complex is individually assessed, it may be managed under a separate harvest limit, when practicable.

Stocks with their own ACLs are managed throughout the range of that stock (as opposed to the species), although issues do arise in the case of stocks straddling international borders. For this reason, allocation of the harvestable surplus of Pacific whiting between the U.S. and Canada is subject to international agreement.

Separate ACLs may be set for geographic subcomponents of a stock for management purposes. However, the development of subcomponent ACLs is based on managing these stocks throughout their range within U.S. waters.

National Standard 4 states that conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishers, such allocation shall be (A) fair and equitable to all such fishers; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed measures will not discriminate between residents of different states. Allocation decisions are also made as part of the biennial harvest specifications process for those stocks for which formal allocations have not been established under the FMP. Chapter 3 describes these allocation decisions. Emphasis is placed on equitable division, while achieving conservation goals. Decision-making on these allocations occurs through the Council process, which facilitates substantial participation by state representatives and the public. Generally, state proposals are brought forward when alternatives are crafted and integrated to the degree practicable.

National Standard 5 states that conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

Measures have been taken to reduce fishing capacity in the limited entry trawl fleet and non-trawl fleets. These measures include the fixed gear permit stacking program implemented by FMP Amendment 14, the trawl vessel buyback program, and catch share management implemented by FMP Amendment 20.

Reducing excess capacity is expected to improve the efficiency in the utilization of fishery resources as well as reduce the levels of incidental catch.

Catch share management in the at-sea whiting sectors and the shorebased IFQ fishery promote efficiency of utilization by reducing regulatory discards. Vessels in these fisheries are subject to 100 percent observer coverage, which improves catch accounting.

National Standard 6 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Management measures reflect differences in catch, and, in particular, bycatch, of overfished species, among different fisheries. For example, different RCA configurations are established for different gear types (trawl versus fixed gear), and the catch control tools also differ. For example, at-sea whiting fisheries are managed by co-ops, the shorebased IFQ fishery by IFQs, and limited entry fixed gear fishery for sablefish by vessel-level allocations (permit stacking). Within these fisheries and in the open

access sector, cumulative trip limits are used for particular management units and/or during certain times of the year. Recreational fisheries are managed with area closures and bag limits that are proposed by the states and are appropriate to the catches and characteristics of each state's recreational fishery.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Generally, by coordinating management, monitoring, and enforcement activities between the three West Coast states, duplication and, thus, cost are minimized. Chapter 3 evaluates proposed management measures in detail, including consideration of associated costs and duplication.

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), ... take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The 2015 EIS evaluating 2015-2016 harvest specifications and management measures and Amendment 24 to the PCGFMP (PFMC and NMFS 2015) evaluates the long-term effects of alternative harvest management policies on fishing communities. The short-term impacts of the current proposed actions do not differ substantially in context or intensity from the impacts disclosed in the 2015 EIS (see Section 4.2). These effects were taken into account in choosing the Preferred Integrated Alternative (incorporating harvest specifications and related management measures). Target species catch for each alternative is projected based on these management measures; this allows an estimate of resulting ex-vessel revenue and personal income impacts at the community level (with the port group area the unit of analysis for community impacts).

National Standard 9 states that conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Minimizing bycatch, of overfished species in particular, is an important component of the alternatives. Through the use of GCAs, fishing effort is reduced in areas where overfished species are most abundant, thereby reducing potential bycatch. As noted above, catch share management, particularly in the shorebased IFQ fishery, has reduced bycatch by eliminating most regulatory discards (some non-target species are managed with cumulative trip limits, which may induce some level of regulatory discards). Non-trawl sectors use cumulative trip limits as the principal catch control tool. Because trip limits are based on landings, setting them at a low level to discourage directed and incidental catch of overfished species can result in regulatory discards.

The at-sea whiting sectors are managed under bycatch limits for selected overfished species. Mandatory co-ops in the mothership sector are allocated a portion of these sector bycatch limits and are accountable for keeping catch of these species within their allocation. The CP sector operates as a single, voluntary co-op responsible for the bycatch limit assigned to the sector.

As noted above, the at-sea whiting sectors and shorebased IFQ fishery are subject to 100 percent observer coverage. While necessary for catch accounting under IFQ/co-op management, observers also allow complete monitoring of total catch (including bycatch). The limited entry fixed gear sector and directed open access fisheries are subject to partial observer coverage. The observer data are used to develop bycatch rate estimates, which can be used to forecast and account for total catch of all managed species.

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

RCAs may affect safety if more vessels elect to fish seaward of the closed areas and are more exposed to bad weather conditions. Individual accountability under catch share management has resulted in vessels more often fishing seaward of the RCA to avoid catch of species such as canary and yelloweye rockfish, for which the allocations and resulting available QP are limited. As harvesters gain experience with the management program, they may be able to develop opportunities to fish shoreward of RCAs, while avoiding catch of these species, resulting in more inshore fishing. A study reported to the Council in the 2015 Annual State of the California Current Ecosystem Report (California Current Integrated Ecosystem Assessment Team 2015) found that since catch share (IFQ) management was implemented in the groundfish fishery “the overall average annual rate of fishing on high wind days to decrease by 85%, even accounting for the influence of safety trainings and other types of Coast Guard regulations that have varied over time” (p. 19).

The expiration of the moratorium on quota share trading may lead to further capacity reduction and increased profits in the trawl sector. This may result in more investment in vessels and equipment that would enhance safety. Less efficient vessels are expected to leave the trawl fishery as part of this consolidation, which may eliminate older, less safe vessels.

For vessels electing to increase the amount of time fishing seaward of RCAs, implementing a VMS capable of sending distress calls could provide some mitigation. Although units with this capability have been approved for use, vessel owners are not required to purchase a unit with this capability. Also, by providing near real-time vessel position data, VMS could aid in search and rescue operations.

7. Consistency of the Proposed Actions with Other Applicable MSA Provisions

Harvest specifications are set based on targets established in overfished species rebuilding plans, which conform to Section 304(e) Rebuild Overfished Fisheries. Rebuilding plans contain the elements required by Section 304(e)(4) and discussed in the NS1 Guidelines (50 CFR 600.310).

NMFS prepared an EIS evaluating programmatic measures designed to identify and describe West Coast groundfish EFH (NMFS 2005) and to minimize potential fishing impacts on West Coast groundfish EFH. The Council took final action amending the groundfish FMP to incorporate new EFH provisions in November 2005. NMFS partially approved the amendment in March 2006. Implementing regulations became effective in June 2006. The effects of the proposed actions on groundfish EFH are within the scope of effects evaluated in the programmatic groundfish EFH EIS. The Council commenced a 5-year review of its groundfish EFH designation in December 2010. This process is ongoing; the Council is scheduled to choose a preferred alternative in early 2017. The current proposed actions are unlikely to result in adverse impacts to EFH outside those disclosed in Section 4.1.4 in the 2015 EIS. That EIS describes impacts of the groundfish management program on EFH, consistent with the EFH assessment requirements of 50 CFR 600.920 (e)(3).

NMFS will compile any additional necessary information required to be contained in a fishery impact statement, Section 303a(9), for [Amendment 27](#).

8. Literature Cited

- Berger, A. M., L. Arnold, and B. T. Rodomsky. 2015. Status of Kelp Greenling (*Hexagrammos decagrammus*) along the Oregon Coast in 2015. Pacific Fishery Management Council, Portland, OR.
- California Current Integrated Ecosystem Assessment Team. 2015. California Current Integrated Ecosystem Assessment (CCIEA) State of the California Current Report, 2015. NOAA Northwest, Southwest and Alaska Fisheries Science Centers, March 2015.
- Cope, J. M., D. Sampson, A. Stephens, M. Key, P. P. Mirick, M. Stachura, and coauthors. 2015. Assessments of Black Rockfish (*Sebastes melanops*) Stocks in California, Oregon, and Washington Coastal Waters. Pacific Fishery Management Council, Portland, OR.
- Gertseva, V., S. E. Matson, and E. Council. 2015. Status of the darkblotched rockfish resource off the continental U.S. Pacific Coast in 2015. Pacific Fishery Management Council, Portland, OR.
- He, X., D. E. Pearson, E. J. Dick, J. C. Field, S. Ralston, and A. D. MacCall. 2011. Status of the widow rockfish resources in 2011. Pacific Fishery Management Council, Portland, OR.
- Hicks, A. C. and C. R. Wetzel. 2015. The Status of Widow Rockfish (*Sebastes entomelas*) Along the U.S. West Coast in 2015. Pacific Fishery Management Council, Portland, OR.
- Maunder, M., J. T. Barnes, D. Aseltine-Neilson, and A. D. MacCall. 2006. The Status of California Scorpionfish (*Scorpaena guttata*) off Southern California in 2004. *in* Volume 1: Status of the Pacific Coast groundfish fishery through 2005, Stock assessment and fishery evaluation: Stock assessments and rebuilding analyses. Pacific Fishery Management Council, Portland, OR.
- NMFS (National Marine Fisheries Service). 2005. Pacific Coast Groundfish Fishery Management Plan Essential Fish Habitat Designation and Minimization of Adverse Impacts Final Environmental Impact Statement. National Marine Fisheries Service, Northwest Region, Seattle, WA.
- PFMC. 2014. Status of the Pacific Coast Groundfish Fishery: Stock Assessment and Fishery Evaluation. Pacific Fishery Management Council, Portland, OR.
- PFMC (Pacific Fishery Management Council). 2016. Status of the Pacific Coast Groundfish Fishery, Stock Assessment and Fishery Evaluation (SAFE), Description of the Fishery, Portland (OR), April 2016.
- PFMC and NMFS (Pacific Fishery Management Council and National Marine Fisheries Service). 2015. Final Environmental Impact Statement for Harvest Specifications And Management Measures for 2015-2016 and Biennial Periods Thereafter; Includes the Reorganization of Groundfish Stock Complexes, Designation of Ecosystem Component Species and Amendment 24 to the Pacific Coast Groundfish Fishery Management Plan to Establish a Process for Determining Default Harvest Specifications, Portland and Seattle, January 2015.
- Ralston, S. 2006. An Assessment of Starry Flounder off California, Oregon, and Washington (2005). *in* Volume 2: Status of the Pacific Coast groundfish fishery through 2005, Stock assessment and fishery evaluation. Pacific Fishery Management Council, Portland, OR.
- Thorson, J. T. and C. Wetzel. 2015. The status of canary rockfish (*Sebastes pinniger*) in the California Current on 2015. Pacific Fishery Management Council, Portland, OR.

