

ECONOMIC IMPACTS UNDER THE HARVEST GUIDELINE OPTIONS FOR MINOR NEARSHORE ROCKFISH NORTH OF 40° 10' NORTH LATITUDE

Economic impacts under the harvest guideline (HG) options for the minor nearshore rockfish complex north of 40° 10' North latitude were analyzed for the affected commercial and recreational fisheries. Under certain annual catch limit (ACL) alternatives, the GMT projects that the HG options would impact landings by portions of the Nearshore Open Access (OA) commercial fishery sector operating in Oregon and Northern California waters; and also on effort levels in recreational fisheries in Northern California, Oregon and, Washington.

Description of Harvest Guideline Options for Minor Nearshore Rockfish

- Option 1 (“No Action”): Continue to manage the Nearshore Rockfish complex, holding impacts to the complex-level ACL in each region.
- Option 2: Manage the Nearshore Rockfish complex according to state-specific harvest guidelines stratified at 40°10' N. latitude reflecting apportionment based on the miles of coastline in each state.
- Option 3: Manage the Nearshore Rockfish complex according to state-specific harvest guidelines stratified at 40°10' N. latitude reflecting apportionment based on the historical recreational and commercial catch between 2004 and 2012.
- Option 4: Manage the Nearshore Rockfish complex according to state-specific harvest guidelines stratified at 40°10' N. latitude reflecting a hybrid method of apportionment based on miles of coastline for China, quillback and copper rockfish and historical recreational and commercial catch between 2004 and 2012 for the remaining species in the complex.

Economic Impact Measures

Nearshore Open Access Commercial Fishery

Impacts on projected landings of minor nearshore rockfish by the commercial Nearshore OA sector by area (Oregon and Northern California) were translated into ex-vessel revenue impacts using average ex-vessel value per landed roundweight pound observed in 2013. Ex-vessel revenue impacts were distributed to likely landings ports (port areas) using the 2013 distribution of minor nearshore rockfish landings in port areas north of 40°10' North latitude. The projected ex-vessel revenue impacts were translated into income impacts using IO-PAC commercial fishery income impact coefficients for West Coast port areas developed for analyzing commercial fisheries impacts under the 2015-16 Groundfish harvest specifications alternatives¹.

Recreational Fisheries

Where available, the GMT's projections for recreational angler effort (number of angler-trips) under the relevant HG options were translated into income impacts using IO-PAC recreational fishery income impact multipliers for angler-trips originating from West Coast port areas. These multipliers were developed for analyzing recreational fishery impacts under the 2015-16 Groundfish harvest specifications alternatives. In cases where impacts on recreational fishing effort are expected but are currently not

¹ IO-PAC is set of models used for estimating commercial and recreational fishery-related economic impacts. Fisheries industry detail in IO-PAC is estimated from economic data surveys of expenditures by vessels and processors and by recreational anglers participating in West Coast groundfish fisheries. The model is maintained by Northwest Fisheries Science Center and used by the Pacific Fishery Management Council to estimate economic impacts of West Coast fishery management actions (Leonard and Watson 2011).

quantifiable due to outstanding uncertainties in how HG options would be implemented, qualitative indicators of the direction and magnitude of expected impacts are presented.

Economic Impact Results

The GMT projected a range of commercial fisheries landings impacts under the HG options, depending on how successful Nearshore OA fishery participants may be in avoiding encounters with minor nearshore rockfish. The endpoints of the range are labeled “best case” and “worst case”, respectively. If harvesters are able to avoid discarding so that all nearshore rockfish catch were landed, then the best case landings scenario would result. However if nearshore rockfish encounter rates are high so that discarding is necessary, then in order to accommodate the additional discard mortality the lower, worst case nearshore rockfish landings scenario would result.

Impacts were projected for affected commercial fisheries port areas and/or recreational fisheries management areas for each relevant minor nearshore rockfish HG option under the Council’s Preferred ACL Alternative. Indicators are also presented for expected impacts under the minor nearshore rockfish harvest HG with respect to ACL Alternative 2 ($P^*=0.25$). Ex-vessel revenue and personal income impacts resulting from effects of the minor nearshore rockfish HG options on landings by the nearshore OA sector in affected port areas are shown in Table 1 and Table 2. Table 1 shows projected impacts under the HG options on affected port areas in Oregon and Northern California compared with impacts if the Preferred ACL alternative were selected. Table 2 compares impacts on the same list of affected port areas compared with projected impacts if the $P^*=0.25$ ACL Alternative (Alternative 2) were selected. In both cases the baseline values against which the changes (gains or losses) are measured represent ex-vessel revenue and income impacts from the entire range of species caught by the Nearshore OA fishery, not just the portion attributable to harvest of nearshore rockfish complex species.

Nearshore Open Access Commercial Fishery Impacts

Table 1 shows all Oregon port areas would be adversely affected under all four HG options, with the greatest impacts projected under HG Option 2. The most heavily impacted port area under HG Option 2 is Coos Bay-Brookings, which is projected to lose up to 8.5 percent (worst case) of its Preferred Alternative ex-vessel revenue and income from Nearshore OA fisheries. Table 2 shows additional reductions in ex-vessel revenue and income from the already lower levels under Alternative 2 of approximately six percent for Coos Bay-Brookings under all four HG options. Ex-vessel revenue and income from Nearshore OA fisheries in the Crescent City-Eureka Port Area are projected to increase from their levels under Alternative 2 by up to approximately 10 percent under HG Option 3 (best case).

Table 1. Projected change in ex-vessel revenue and personal income impacts by affected Port Area under the Minor Nearshore Rockfish HG Options compared with corresponding levels projected for the entire range of species caught in the fishery under the Preferred ACL Alternative.

	Astoria-	Newport	Coos Bay-	Crescent City-
<i>Ex-vessel Revenue Impacts (\$,000)</i>				
<i>Nearshore OA Exvessel Rev under</i>				
PA	151	65	1,170	420
HG Option 1	-0	-1	-29	+17
HG Option 2				
worst case	-1	-2	-99	+2
best case	-1	-1	-77	+29
HG Option 3				
worst case	-1	-1	-78	-14
best case	-1	-1	-63	+40
HG Option 4				
worst case	-1	-2	-86	+2
best case	-1	-1	-69	+38
<i>Income Impacts (\$,000)</i>				
<i>Nearshore OA Inc Impact under</i>				
PA	85	76	921	331
HG Option 1	-0	-1	-23	+16
HG Option 2				
worst case	-1	-2	-78	+2
best case	-1	-2	-61	+28
HG Option 3				
worst case	-1	-2	-61	-13
best case	-0	-1	-49	+38
HG Option 4				
worst case	-1	-2	-68	+2
best case	-0	-1	-54	+36

Table 2. Projected change in ex-vessel revenue and personal income impacts by affected Port Area under the Minor Nearshore Rockfish HG Options compared with corresponding levels projected for the entire range of species caught in the fishery under ACL Alternative 2 (P*=0.25).

	Astoria-	Newport	Coos Bay-	Crescent City-
<i>Ex-vessel Revenue Impacts (\$,000)</i>				
<i>Nearshore OA Exvessel Rev under</i>	137	60	948	412
HG Option 1	-1	-1	-56	+19
HG Option 2				
worst case	-1	-1	-56	+4
best case	-1	-1	-56	+32
HG Option 3				
worst case	-1	-1	-56	-12
best case	-1	-1	-56	+42
HG Option 4				
worst case	-1	-1	-56	+4
best case	-1	-1	-56	+41
<i>Income Impacts (\$,000)</i>				
<i>Nearshore OA Inc Impact under</i>	78	70	746	324
HG Option 1	-0	-1	-44	+18
HG Option 2				
worst case	-0	-1	-44	+4
best case	-0	-1	-44	+31
HG Option 3				
worst case	-0	-1	-44	-12
best case	-0	-1	-44	+41
HG Option 4				
worst case	-0	-1	-44	+4
best case	-0	-1	-44	+39

Recreational Fishery Impacts

Table 3 and Table 4 show estimated recreational angler-trips and associated personal income impacts for areas where effects on recreational effort under the HG options are quantifiable. Table 3 shows projected effort and income impacts under the HG options for the Northern California Management Area compared with the corresponding quantities under the Preferred ACL alternative, season option 1 and status quo nearshore rockfish HG. Table 4 compares projected impacts for all Washington Coast Port Areas compared with ACL Alternative 2 (P*=0.25) and nearshore rockfish HG Option 3, compared with ACL Alternative 2 (P*=0.25) and status quo nearshore rockfish HG. Preliminary analysis of the Oregon recreational fishery² indicates that under ACL Alternative 2 (P*=0.25), even prohibiting retention of nearshore rockfish year-round would still result in exceeding the recreational share of the Oregon HG by approximately 2 percent. Reducing recreational harvest of nearshore rockfish to stay within the HG would require closing the Oregon recreational fishery one or more months during the year (Table 5).

Results in Table 3 indicate projected declines in Northern California Management Area effort and income impacts compared with the Preferred Alternative under all four nearshore rockfish HG options, ranging from -4,400 angler-trips and \$327 thousand (-18 percent) in personal income impacts under HG Option 1 to -2,600 angler-trips and \$191 thousand (-11 percent) in personal income impacts under HG Option 3.

² Once state-specified harvest guidelines are chosen by the Council, Oregon will need to conduct its state process to determine the commercial and recreational sharing of that HG. This preliminary analysis was done assuming the sharing percentages currently in place in Oregon regulations.

Results in Table 4 show projected declines under HG Option 3 compared with Alternative 2 (P*=0.25) for all Washington Coast Port Areas of 19.4 thousand angler-trips (-58 percent) and \$3.6 million income impact (-64 percent)³.

It is difficult to quantify the effects on Washington and Oregon angler effort under scenarios where nearshore rockfish retention is prohibited for one or more months. Since nearshore rockfish species are not targeted by most anglers (average catch is less than one per angler-trip), non-retention of nearshore rockfish by itself may not have much impact on angler effort. However, the cumulative effect of new management measures needed to stay within the nearshore rockfish HGs on top of management measures already in place to reduce encounters with overfished species may combine to discourage anglers from participating in recreational fisheries.

To illustrate the potential economic impact resulting from prohibition of nearshore rockfish retention in Washington and Oregon recreational fisheries under certain HG options, it is thought that impacts ranging from a 10 percent reduction under the less restrictive HG options to a 20 percent reduction in angler-trips targeting groundfish under the most restrictive HG option may be expected. By comparison, in 2012 there were 24,200 recreational bottomfish trips originating from Washington coastal ports and 72,500 recreational bottomfish trips originating from Oregon coastal ports. Together these trips generated an estimated \$10.6 million in personal income impacts in Washington and Oregon coastal communities, an average of about \$110 personal income impacts per angler-trip.

Table 3. Projected change in recreational angler-trips and personal income impacts for the Northern California Management Area under the Nearshore Rockfish HG Options compared with corresponding levels projected under the Preferred ACL Alternative and Season Option 1.

	<i>No Action</i>	<i>Preferred Alt Season Op 1</i>	PPA Season Op 1 + NS RF HG Option 1	PPA Season Op 1 + NS RF HG Option 2	PPA Season Op 1 + NS RF HG Option 3	PPA Season Op 1 + NS RF HG Option 4
North California Coast: Del Norte and Humboldt Counties						
Angler-trips (thousand)	20.1	24.5	-4.4	-4.2	-2.6	-3.8
Income Impacts (\$,000)	1,498	1,825	-327	-312	-191	-283

³ Base level angler-trips and income impacts reported in Table 4 under *No Action*, the *Preferred Alternative* and *Alternative 2* include about 9,400 Washington Coast Pacific halibut angler-trips.

Table 4. Projected change in recreational angler-trips and personal income impacts for all Washington Coast Port Areas under Minor Nearshore Rockfish HG Option 3 compared with corresponding levels projected under ACL Alternative 2 (P*=0.25)t.

	<i>No Action</i>	<i>Preferred Alt Season Op 1</i>	<i>Alt 2 Season Op 1</i>	Alt 2 (P*=.25) Season Op 1 + NS RF HG Option 3
Washington Coast: Neah Bay-La Push to Ilwaco-Chinook				
Angler-trips (thousand)	33.6	33.6	33.6	-19.4
Income Impacts (\$,000)	5,606	5,606	5,606	-3,608

t Base level angler-trips and income impacts reported under *No Action*, the *Preferred Alternative* and *Alternative 2* include about 9,400 Washington Coast Pacific halibut angler-trips.

Table 5. Potential change in Oregon recreational angler-trips from Status Quo (SQ) based on example closure periods that may be required under Minor Nearshore Rockfish HG Option 1 and ACL Alternative 2 (P*=0.25).

Closed Months	Total SQ Angler-trips	Change in Angler-trips from SQ	Percent Change
Jan-Feb	79,016	-2,789	-3.5%
Oct-Dec	80,251	-1,554	-1.9%

References

Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific coast fisheries. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.