

Draft Groundfish Management Team Preliminary Recommendations for  
Acceptable Biological Catch and Optimum Yield Levels in 2001

**Lingcod** - Lingcod was designated as overfished in 1999 based on an assessment of the northern portion of the stock. A coastwide assessment was prepared in 2000 that confirmed the stock is overfished. Separate ABCs were calculated for the northern (Vancouver-Columbia) and southern (Eureka-Monterey-Conception) areas based on  $F_{45\%}$ . The 1999 rebuilding analysis for the north calculated the 2001 harvest level (275 mt), and the GMT's lower OY (550 mt) is calculated by applying this same amount to both the northern and southern areas. The upper OY (611 mt) is the sum of the yields (307 mt plus 304 mt) from the two new assessments associated with a constant exploitation rate where 60% of the simulated runs rebuilt in 9 years.

**Sablefish** - ABC (7,661 mt) is based on the  $F_{45\%}$  harvest rate, and OY (6,895 mt) is based on application of the 40-10 harvest policy (the stock is currently estimated at 37% of the initial biomass). There is substantial uncertainty in the stock assessment, and incoming recruitment appears poor.

**Pacific ocean perch (POP)** - the ABC for this overfished stock is based on the 2000 assessment for the Vancouver and Columbia areas (1,523 mt at  $F_{msy}$ ) plus 18 mt for the Eureka area. The preliminary OY range of 400-760 mt is based on precautionary evaluation of yields that have a high likelihood of achieving the rebuilding target in 10 years (low) and application of the 40-10 policy to the  $F_{msy}$  yield for 2001 (high).

**Widow rockfish** - the 2000 assessment indicates the stock has declined to about 24% of its unfished reproductive potential and is overfished. However, a preliminary rebuilding analysis prepared after the STAR Panel review indicates the stock is slightly above the overfished threshold (29%). The analysis used a different methodology, similar to the POP analysis. Because the rebuilding analysis had not been reviewed by the STAR Panel or SSC, the GMT based its preliminary ABC recommendation (3,727 mt) on the stock assessment using the  $F_{50\%}$  harvest rate. One OY option (2,864 mt) is based on the 40-10 default OY policy; the second OY option (1,775 mt) is based on  $F_{65\%}$ . Initial analysis indicates the stock can rebuild within 10 years if fishing mortality is held to the  $F_{65\%}$  level.

**Canary rockfish** - Two new assessments for canary rockfish were completed during 1999, in northern and southern areas, separated at Cape Blanco. Although each area was assessed separately, there is no definitive evidence for separate northern and southern stocks of canary rockfish. The division was made to simplify the assessment procedure for a variety of reasons (different data sets, etc.). Each assessment indicates the canary rockfish population is overfished at this time. Landings and survey data indicate an absence of older female canary rockfish, and two possible explanations for this are explored in the northern assessment. The first possibility (scenario 1) is that females die from natural mortality at a faster rate than males, and the difference becomes greater with age. The second possibility (scenario 2) is that female canary rockfish die at a consistent rate as they age (i.e., are subject to a constant mortality rate) but become more difficult to catch as they get older. At this time, the scientific community is uncertain which explanation is correct; the 1996 and 1999 STAR Panels concluded both assumptions were equally valid. However, Scenario 1 is consistent with the yellowtail rockfish assessment. The two scenarios lead to significantly different conclusions with respect to current abundance and the status of the stock compared to unfished conditions. Under scenario 1 (females die younger), current spawning biomass is estimated to be 949 mt for the northern area, which is 6.8% of the unfished spawning biomass. Under scenario 2 (female canary rockfish don't die young, but don't get caught), the northern population is in significantly better shape, with current spawning biomass estimated at 6,663 mt, which is 22.9% of the unfished spawning biomass. In either case, the canary rockfish stock is below 25% of the unfished biomass and therefore overfished.

The southern assessment was the first ever for that portion of the geographic range of the stock. The southern model performed better under the assumption of constant natural mortality than under the assumption of increasing mortality with age for females. Under base case conditions, the current spawning biomass in the southern area is estimated to be 529 mt, which is 7.7% of the unfished spawning biomass. If female canary rockfish actually die younger than males, the condition of the stock is substantially worse.

There is tremendous uncertainty in the rebuilding projections due to poorly estimated levels of recruits per spawner during 1996-1998. The 1996-1998 recruits per spawner level appear anomalously high relative to the 1987-1995 estimates due to a high number of young canary captured in the 1998 triennial trawl survey. If recent recruitment is similar to the earlier period, it will be difficult to rebuild to the current target biomass, even with no fishing mortality. If recent recruitment is high, and one of the three years is used in the projection, catch in 2001 would need to be only about 13-15 mt per year in order for the stock to begin to rebuild. If all three years are used, annual catches of 150-185 mt in the north would allow rebuilding. Such an optimistic scenario is risky because it is based upon three large, but poorly estimated, recruitments in 1996-1998. Intermediate scenarios using the 1996-1998 recruitments at a reduced level (as recommended by the 1999 STAR panel for canary rockfish) would reduce catches to 25-40 mt. The southern portion of the stock appears to be similar to the northern stock with respect to rebuilding. The GMT believes the coastwide total catch should be constrained within the overall range of 23-50 mt.

**Chilipepper rockfish** - The ABC (3,681 mt) for the Monterey and Conception areas is based on the 1998 assessment and application of the  $F_{40\%}$  harvest rate. The stock is estimated to be above the 40% precautionary threshold, so the default OY would equal ABC. Application of  $F_{50\%}$  results in an ABC of 2,700 mt. The GMT recommends OY remain at 2,000 mt. (The northern remaining rockfish ABC in 2000 includes 43 mt of chilipepper for the Eureka area.)

**Splitnose rockfish (often called "rosefish")** - ABC (615 mt) is a reduction from 2000 based on the revised  $F_{msy}$  harvest rate policy. ABCs for stocks assessed using  $F=M$  are reduced 25% as a "risk neutral" adjustment. (For 2000, this was the OY adjustment). Consistent with the Council's precautionary policy, the GMT's OY recommendation (461 mt) reflects a 25% reduction from ABC because of the less-rigorous assessment method used for this stock.

**Yellowtail rockfish** - the ABC recommendation (4,495 mt) applies to the Eureka, Columbia, and Vancouver areas, including the Canadian portion. The stock is estimated to be at 63% of its pristine level. Subtracting the Canadian portion of the Vancouver area (30%) results in the U.S. ABC of 3,146 mt. This is less than the 2000 ABC due to application of the  $F_{50\%}$  harvest rate. OY would equal ABC due to current stock abundance. However, even with this lower exploitation rate, the stock is expected to continue declining in the near future due to poor recruitment in recent years.

**Shortspine thornyhead** - the ABC recommendation (757 mt) is based on a synthesis of two stock assessments prepared in 1998 and application of the  $F_{50\%}$  harvest rate. The assessment addressed the area north of 36° N latitude, which is the northern boundary of the Conception area. Therefore, this ABC and OY apply only to that area. The stock size was estimated to be 32% of the unfished abundance in 1999. The OY (689 mt) is based on  $F_{50\%}$  and the 40-10 policy. The landed catch equivalent will reflect a reduction for discard. A separate ABC and OY (based on historical catch) apply to the part of the Conception area north of Point Conception; there is no ABC or OY for the southern Conception area.

**Longspine thornyhead** - the ABC (4,102 mt) north of the Conception area is the same as in 2000, based on the average of the 3 year individual ABCs at  $F_{35\%}$ . The stock is estimated to be above the 40% precautionary threshold. If the Council chooses to apply the  $F_{50\%}$  harvest rate and the revised discard adjustment, the total and landed catch OYs would be 2,461 mt and 2,067 mt, respectively. The ABC and OY for the Conception area apply north of Point Conception. The southern Conception area has neither an ABC or OY.

**Cowcod** - the 1999 assessment indicates current biomass in the Conception area is 4 -11% of the initial biomass (best estimate is 7%) and therefore overfished. The 2000 ABC was set at 5 mt, and OY less than 5 mt. The rebuilding analysis confirms that total catch must be no more than 0.6 to 6.4 mt. The base case (60% probability of achieving rebuilding in the allotted time) is 2.1 mt.

**Darkblotched rockfish** - The 2000 assessment indicates the stock is overfished, with the best estimate of current biomass about 22% of the initial biomass. A major uncertainty in the assessment is historic catch of darkblotched rockfish in the Russian fishery from 1965-1978. It is likely some percentage of the red rockfish catch was really darkblotched rockfish. Only the model assuming no foreign catch or the model with variable

likelihood weights and priors given 37 mt catch would not be considered overfished in 2003. In all cases, the spawning biomass increased over the three year time period with the reduced catch and the estimated very large 1994 year class reaching maturity. The ABC range reflects a range of 10% darkblotched in the Russian catch and 0%. The lower OY (95 mt) is the constant annual catch that would rebuild the stock in 10 years, based on the 10% assumption. The upper OY (159 mt) is the constant catch to rebuild in 10 years, assuming 0%.

**Minor Rockfish (north)** - this category includes the "Remaining Rockfish" (ABCs based on  $F=M$ ) and "Other Rockfish" (ABCs based on historical catch) categories in the U.S. Vancouver, Columbia, and Eureka areas combined. The ABC is the sum of all those individual species ABCs in these areas. Each of the ABCs for "remaining rockfish" was reduced by 25% from the 2000 value in line with the reduced (risk neutral) harvest rate (previously, this was an OY reduction). The total catch OY is the sum of 75% of the "remaining rockfish" ABCs plus 50% of the "other rockfish" ABCs in these three areas. The reduction in the contribution of remaining and other rockfish to OY is intended to address uncertainty in stock status due to limited information. The expected commercial landed catch target in 2001 will reflect recreational harvest and may also reflect a 16% discard adjustment for the limited entry fishery.

**Minor Rockfish (south)** - this category includes the "Remaining Rockfish" (ABCs based on  $F=M$ ) and "Other Rockfish" (ABCs based on historical catch) categories in the Monterey and Conception areas combined. The ABC is the sum of all those individual species ABCs in these areas. Each of the ABCs for "remaining rockfish" was reduced by 25% from the 2000 value in line with the reduced (risk neutral) harvest rate (previously, this was an OY reduction). The total catch OY is the sum of 75% of the "remaining rockfish" ABCs plus 50% of the "other rockfish" ABCs in these three areas. The reduction in the contribution of remaining and other rockfish to OY is intended to address uncertainty in stock status due to limited information. The expected commercial landed catch target in 2001 will reflect recreational harvest and may also reflect a 16% discard adjustment for the limited entry fishery.

**Bank rockfish** - the GMT recommends ABC be increased from 81 mt in 2000 to 350 mt for 2001. This species will contribute 200 mt (75% of ABC, minus 25% as a precautionary adjustment) to the 2001 minor rockfish OY in the south.

**Dover sole** - The 1997 Dover sole assessment evaluated the resource north of 36° N latitude as a unit, and provided ABCs for landed catch based on the both the  $F_{35\%}$  and  $F_{40\%}$  harvest rates. The GMT has put forward the option of staying at the current ABC or reducing to the  $F_{40\%}$  ABC. The Conception area Dover sole ABC is at the level established in the original FMP, which was based on average landings. The GMT reduced this by 50%, consistent with the new harvest policy. The ABCs represent total catch, and were converted by estimating that 5% of the total catch is discarded. Therefore, the coastwide ABC and OY range of 7,677 - 9,426 mt are for total catch with a landed catch equivalent of 7,293 - 8,955 mt.

"Risk neutral" ABCs for the other flatfish species were calculated by applying the same percent reduction as for petrale sole.

PFMC  
GMT  
09/13/00



3-year yields for POP using the STAR-panel preferred model (1d), and applying the 40-10 reduction to the Fmsy and F50% harvest amounts for the U.S. Vancouver - Columbia areas

	2001	2002	2003
% unfinished spawning biomass	25%	25%	25%
<b>Fmsy</b> Yield	1,523	1,592	1,651
F40-10 Yield @ <b>Fmsy</b>	762	796	826
Landed catch OY	<b>640</b>	<b>669</b>	<b>693</b>
% unfinished spawning biomass	25%	25%	25%
<b>F50%</b> Yield	1,252	1,319	1,379
F40-10 Yield @ <b>F50%</b>	626	660	690
Landed catch OY	<b>526</b>	<b>554</b>	<b>579</b>

Recent historical landings and management of POP in the U.S. Vancouver - Columbia areas

Year	Landings	Cumulative limits	
		As implemented during each year	Monthly equivalent
1995	<b>701</b>	6,000 lb / month	6,000 lb
1996	<b>645</b>	10,000 lb / 2-months	5,000 lb
1997	<b>515</b>	8,000 lb / 2-months	4,000 lb
1998	<b>472</b>	8,000 lb / 2-months	4,000 lb
1999	<b>544</b>	4,000 lb / month	4,000 lb
2000	227 (OY)	200 lb / month	200 lb
Average landings			
1995-99	<b>575</b>		
1996-99	<b>544</b>		

Comparison of DTS landed catch OYs using status quo discard assumptions versus rates from application of the EDCP analysis formula to fleet landings during 1997-99.

	Total catch OYs	Assumed discard rate			Landed catch OYs	
		2000	EDCP		2000	EDCP
			1997-99	as applied		
Sablefish	6,895	10%	29%	17.7%	6,206	5,675
Dover sole	7,677	5%	5%	5%	7,293	7,296
	9,426	5%	5%	5%	8,955	8,958
Shortspine	689	30%	20%	20%	482	553
Longspine	2,461	9%	17%	17%	2,240	2,051
	4,102	9%	17%	17%	3,733	3,418