

Groundfish Management Team Revised Estimates of Sablefish Bycatch/Discard Mortality
and Options to Apportion Bycatch Mortality Among Commercial Fishing Sectors

This report is an update of the preliminary analysis of options to apportion sablefish bycatch/discard mortality in 2001. The first table is an updated version of the 4-option table presented at the September Council meeting. The second is a step-by-step review of the assumptions in arriving at the discard rates used in the first table. It is important to clarify that because some survival of discarded sablefish is expected, the term 'total catch' OY is misleading. Rather, it should be considered a 'total kill' OY or allocation. As a result, it is no more appropriate to apply a discard mortality rate to the total amount of fish caught, than it would be to apply the rate to the total landings. In this analysis, the GMT has attempted to reconstruct the amount of fish that would be killed as discard mortality, per 100 lb of landings, and to calculate an appropriate rate by dividing this amount by the sum of landings (100) plus the discard mortality.

Fixed-gear fleet: The GMT drew upon its previous analysis of fish-size differentials between the different phases of the fishery to postulate the amount of fish the fleet might be cycling through, in order to achieve higher percentage of larger fish in the daily trip limit (DTL) and mop-up phases. Since we know next to nothing about how the fish are actually handled or how much ghost fishing is occurring, the GMT chose a mortality rate of 20% for discarded fish. The GMT consulted with Mike Rust, NMFS, about potential long-term stress mortality that might be delayed after capture and release. He pointed out that the effect of a stressful event may not run its course for a week after the event. Even if the fish are handled well, changes in water temperature as they are brought to the surface can provide sufficient shock to the system to eventually result in death. The GMT also included some anticipated discard for participants in the 3-tiered fishery who were at or near the limit in the 1999 fishery.

Trawl fleet: In calculating total trawl discard mortality, the GMT tried to acknowledge two facts. First, some discard occurs in trips without Dover sole, thornyheads and trawl-caught sablefish (DTS) complex landings (and these were not included in deriving the 29% figure). Second, elimination of the limit for small sablefish, if continued in 2001, will reduce size-related discards. The GMT assumed this might result in a 20% reduction in the 29% rate, due to increased retention of small fish. The GMT then added an arbitrary 5%-points to this amount to reflect discard that was not included (which presumably occurred because vessels were already at their limit). The GMT assumed an average mortality rate of 70% for discarded fish, which may be too low for a predominantly summer fishery, and may be too high for a winter fishery. It may be appropriate to estimate trawl discard survival based on the target fishing opportunities the Council adopts.

Assumed distribution of sablefish sizes after, distribution of 'Unspecified grade' fish, using average price for all landings of the same condition and size

	DTL fishery		3-tiered fishery		Mop-up fishery	
Large	22.0%	63.6%	11.0%	43.1%	22.2%	61.2%
Medium	41.7%		32.0%		39.1%	
Small	30.1%	36.4%	42.0%	56.9%	32.8%	38.8%
Extra-small	6.2%		14.9%		6.0%	

Assessment of discard mortality in the DTL and Mop-up fisheries

If the 3-tiered fishery is taken to be the "true" encounter rate, the amount of fish that would have been caught in order to get 62 lb of L-M in every 100 landed would be:	144.2
So, for every 100 lb landed, the amount discarded would be:	44.2
If the total mortality rate from handling, time on deck, ghost fishing, etc. is:	20%
The amount of discard mortality poundage would be:	8.8
The sum of landed catch and discard mortality poundage would be:	108.8
Yielding discard mortality as a % of [landings + discard mortality] of:	8%

Assessment of discard mortality in the 3-tiered fishery

Of the 164 eligible permits, 68 had landing close to their limits in 1999, representing:	41%
If the amount of their actual catch exceeded their landings by:	15%
Given the generally proportional distribution of permits that achieved limits throughout the 3 tiers, this rate of overage would result in discard as a % of landings of:	6.2%
Using the mortality rate from above (20%), 100 lb of landings would produce mortality lbs =	1.2

If we weight these discard rates the fish caught in each portion of the fishery, we get

	<u>DTL</u>	<u>3-tier</u>	<u>Mop-up</u>	
discard rate	8%	1.2%	8%	
weight	15%	80%	5%	
fleet	1.2%	1.0%	0.4%	2.6%

However, if the ITQ moratorium were lifted for the fishery in 2001 and a generally unconstraining season length were set, we would have to seriously consider applying the 8% rate estimated for the DTL and mop-up fisheries to the entire LE fixed-gear allocation.

Trawl sablefish mortality rate

<u>EDCP discard rate</u>	<u>sm. fish savings of 20%</u>	<u>add. discard from non-DTS land.</u>	<u>Overall discard rate</u>	<u>landings + discard / 100 lb land.</u>	<u>assumed mortality rate</u>	<u>lbs of discard mort.</u>	<u>Discard mort. / (landings + dis. mort.)</u>
29%	23%	5%	28%	139	70%	27	22%