

GROUND FISH MANAGEMENT TEAM REPORT ON THE BAROTRAUMA WORKSHOP  
AND POTENTIAL USE OF RECOMPRESSION CATCH-AND-RELEASE SURVIVAL  
ESTIMATES

**Recommendation:** The Groundfish Management Team (GMT) recommends analyzing and developing mortality rates associated with the use of descending devices for incorporation into management, and provides the following thoughts for consideration.

*Overview*

Given the anticipated Council action, this report outlines the GMT's perspective on what is needed and considerations for the timeline in which it could be implemented. The Pacific Fish Smart Barotrauma Workshop provided a successful forum for discussing: consistent messaging for outreach to anglers, scientific studies on the mortality rates for fish released with descending devices, and integration of mortality rates into estimates of impacts in west coast recreational fisheries. While this GMT report focuses on the recreational fisheries, similar consideration could be given to nearshore fishery (e.g., rod and reel fishermen using descending devices). The Council should consider whether to expand the scope to include the commercial nearshore fisheries and under what timeframe.

First of all, the GMT supports the use of descending devices and believes that they should be promoted to recreational anglers, and fishermen in the rod and reel nearshore commercial fisheries. It is almost certain that such descending devices increase the chance of survival compared to fish released at the surface. At the same time, depth and species-specific survival rates are uncertain, as are our basic estimates of catch and release by depth, and therefore subject to issues of statistical accuracy and precision. If the Council wishes to incorporate studies on the use of descending devices, the GMT recommends a thorough review in the context of recreational survey and catch estimation methods to ensure they meet the standards of the best available science. Even absent the interest in descending devices, the GMT has identified an update of the current discard mortality rates as a need. Addressing that need is also a question of workload priority for the Council and its partners.

Many of the most restrictive regulations (e.g., depth restrictions and area or season closures) in hook-and-line fisheries (i.e., recreational and commercial nearshore) are designed to ensure that mortalities of overfished rockfish species (i.e., yelloweye rockfish, canary rockfish, and cowcod rockfish) stay within relatively small harvest guidelines and annual catch limits. Since regulations used to reduce discard mortalities of these fish are most restrictive to hook-and-line fisheries, discard mortality estimates should be as accurate as possible, by integrating the best available science. Discard mortality rates currently applied to released fish may be greater than what is actually occurring, due to evidence of use of descending devices by hook-and-line fishery participants, because the rates we use now assume that all fish are released at the surface. Releasing rockfish with descending devices results in lower discard mortality rates than releasing rockfish at the surface without the aid of descending devices (see Agenda Item D.2.a, Attachment 2). Current catch accounting methodologies, however, assume that all rockfish are released at surface without descending devices. Therefore, it is possible that

discard mortality is overestimated in these fisheries. To improve discard mortality estimates, development of mortality rates for rockfish released with descending devices has been proposed. These mortality rates may then be applied to the proportion of fish released using descending devices to improve the accuracy of discard mortality estimates in these fisheries.

West Coast state recreational management programs have promoted avoidance as a first step to minimize mortality on discarded species and have provided basic information on the use of descending devices for many years. In recent years, this outreach effort has significantly expanded with the development of a variety of new descending tools and more scientific information supporting the benefits of using a descending device to release fish. West Coast efforts have included outreach to party (charter) boat operators, license vendors, recreational fishing clubs, and some commercial fishing groups (Port Orford Ocean Resources Team POORT) as well as distribution of brochures to private anglers. In addition, state recreational sampling programs are beginning to include questions to anglers on the use of descending devices, although this varies by state.

Many anglers are already using descending devices to release rockfish. California Department of Fish and Game (CDFG) has been collecting information on the use of descending devices in the commercial passenger fishing vessel (CPFV) fleet since 2010. Beginning in May 2012, Oregon Department of Fish and Wildlife (ODFW) began acquiring data on the percent of yelloweye and canary rockfish released with descending devices in Oregon. Preliminary information from ODFW shows that through the end of May, 42.5 percent of yelloweye rockfish and 45.6 percent of canary rockfish were reported by anglers to have been released using descending devices.

The GMT supports the development of new mortality rates that incorporates the scientific merits of differential survival rates for released fish when descending devices are used. The Council considered an update of surface release mortality rates, developed by the GMT in 2008, as part of the 2013-2014 harvest specifications and management measures cycle and elected to postpone this update due to other competing priorities and the limited scope of analysis adopted for that management cycle. Given the Council's direction for 2013-2014, many on the team have not had occasion to review the available scientific studies. The process should include appropriate time for review by the Scientific and Statistical Committee (SSC) and the Pacific States Marine Fisheries Commission RecFIN scientific and technical review bodies. The GMT understands that the Council will have to consider this effort against current workload and other competing tasks already underway by the various management and advisory bodies and hope that our summary below of what would need to be done will help in that evaluation.

#### ***Determination of Mortality Rates for Release with Descending Devices***

Accounting for the use of descending devices in discard mortality estimates will require development of mortality rates to be applied to the proportion of fish released using a descending device. There is a substantial amount of research and data that could be used to develop those rates (Agenda Item D.2.a, Attachment 2). For example, studies in which fish were returned to the bottom in cages and re-examined after two days could be used to develop direct estimates of mortality rates. Such estimates of mortality are available for 19 species captured in 30-60 fm south of Point Conception including bocaccio (Jarvis and Lowe, 2008) as

well as canary, yelloweye, blue and black rockfish captured from 10-30 fm in Oregon (Hannah, Rankin and Blume, 2012). Limited data from an acoustic tagging study provide a direct estimate of discard mortality for cowcod (Hyde and Pribyl, unpublished data). The original raw data from cage and acoustic tagging studies can be requested from the authors, who can also be consulted on its use. Recompression studies have only occurred within limited depth ranges, discard mortality rates for rockfish released in depths greater than have been studied can be developed when this information becomes available.

A GMT sub-group can review and analyze the appropriate existing data to develop mortality rates similar to the current depth based mortality matrix for species where there is a lot of data. Proxy estimates of mortality rates for other species in the same guild (shallow vs. deep, pelagic vs. demersal) using data from studies noted above, could be developed as was done in determining surface release mortality rate estimates currently applied in management; however, some members of the GMT are opposed to applying rates to unstudied or understudied species since survival rates in barotrauma studies have been shown to be species specific. The GMT would recommend mortality estimates that are conservative to address data gaps, as was done during the development of the current depth dependent mortality rates currently applied to fish released at the surface.

#### ***Application of Mortality Rates***

In addition to needing estimated mortality rates for fish released using a descending device, an estimate of the proportion of fish released using a descending device will be needed before discard mortality calculations can be made. This will require changes (likely minor) to sampling methodologies in each state to obtain the necessary data and as mentioned above some data is already being collected, although there are differences in the data collected by state. Incorporating changes into state sampling programs that are consistent coast wide may occur on a different timeline for each state. The resulting proportions of fish released using a descending device will be applied to the estimate of discarded fish of each species. The estimates will be apportioned by depth in each stratum, then the depth dependent mortality rate reflecting the use of descending devices at each respective depth will be applied. The depth dependent mortality rates for surface release previously developed by the GMT will continue to be applied to the proportion of discarded fish released at the surface.

#### ***Consideration of Potential Timelines for Implementation***

It is the GMT's understanding that incorporation of mortality rates can be achieved outside of the biennial harvest specifications and management measures process. The review sketched out above should be sufficient to ensure that the estimates and methods adopted are reliable enough to use in management and qualified as best available science. Given this, if the Council chooses to task the GMT with developing new discard mortality rates for fish released with descending devices the Council could consider a timeline that would range from as soon as possible in 2013-2014 or for the next management cycle (2015-2016).

To provide some perspective, the GMT offers the following specific tasks that would need to be accomplished within a chosen timeline. The Council could consider these tasks within a timeline that is very aggressive and allows for implementation in 2013-2014 or over a longer time period that might implement updated discard rates for the 2015-2016 management period.

- Task the GMT to begin data review and analysis to prepare a draft report to be included in a future briefing book and schedule SSC review.
- Recommend that the states develop and submit proposed methods for applying the new discard mortality rates to produce recreational catch estimates for review by the RecFIN technical committee.
- Request that the RecFIN technical committee provide comments to the states proposed methodologies.
- The GMT and states would need to address issues identified in the SSC/RecFIN review and provide solutions.
- Schedule Council discussion and consideration at an upcoming meeting.
- Task the GMT and SSC to provide a review of future research needed to fill data gaps and provide a statement of need for funding. For example, further research to determine mortality rates for a broader suite of species and depths north and south of Point Conception would be beneficial. Continued research will ensure that as mortality declines from the use of the devices and stocks continue to rebuild making access to deeper depths a possibility, data is available to inform the mortality rates in these depths.

There are tradeoffs between a timeline that implements changes as soon as possible compared to implementation at a later date. Though accounting for reduced mortality is not expected to immediately allow additional fishing opportunity, the resulting reduction in total mortality estimates could reduce the chance that inseason action would be needed if harvest rates were higher than projected. In addition, any estimates that account for reduced discard mortality through the use of discard devices would provide data for use in modeling seasons and depth restrictions for upcoming management cycles. Data collected in 2013 or 2014 would be available for analysis for the 2015-2016 cycle, which begins in the fall of 2013.

On the other hand, the GMT recommends that no new methods be applied until the Council is assured of their legitimacy. There are some on the GMT that are concerned that an aggressive timeline does not sufficiently consider the workload involved not just by those on the GMT but others that are needed for analysis and review. Consideration and implementation over a longer time period acknowledges the time commitments required by the various advisory bodies and management agencies. Of note, given current schedules and other workload items, the earliest the GMT could provide information for review would be November 2012. Additionally, from June through November of 2013, the SSC will be conducting stock assessments and reviewing them at Council meetings and will have limited time for review.

***Recommendation***

**The GMT recommends analyzing and developing mortality rates associated with the use of descending devices for incorporation into management.**

PFMC  
06/20/12