Incorporating Descending Device Use in Recreational Discard Mortality Rates in Pacific Groundfish

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Merit McCrea

- 24 years as full-time fisherman, head boat owner
- 23 years as part time fisherman, relief skipper
- 17 years as full-time academic marine ecology
- 11 years as SoCal Salt Water Editor, Western Outdoor News, in print since 1954
- 6 years Pacific Fisheries Management Council Groundfish Advisory Sub-panel
- 3 years full-time policy wonk/science coordinator for the Sportfishing Association of California

What am I going to tell you?

- Basic framework of the PFMC
  - Covers Washington, Oregon, California and Idaho
  - 5 fisheries management plans including the Groundfish FMP
  - Advisory bodies (AB) salient to groundfish management
- Most of all, how descending device based Discard Mortality Rates (DMR) were integrated into recreational catch accounting and management.

The PFMC

– The Council consists of 14 voting members, including one representative of each state's management agency, one obligatory member from each state, four at-large members, one tribal representative, and one NMFS representative.

FMPs of the PFMC

Groundfish relevant ABs

- Groundfish Advisory Sub-panel (GAP)
  - Large-21 members, trawl, non-trawl commercial, recreational, charter, each state.
- Groundfish Management Team (GMT)
  - Scientists from each state, 12 members. They crunch the numbers and project catch given proposed management.
- Science and Statistical Committee (SSC)
  - 18 members, all scientists, heavy stock assessment background
- Enforcement Consultants (EC)
  - 10 members from states' and federal enforcement. They say how likely compliance will occur given proposed management measures.
- Groundfish Endangered Species Workgroup
  - 11 members, mostly agency. Mostly deal with by-catch challenges regarding ESA listed species.

East Pacific Groundfish

- Benthic sharks and rays
- Gadids like Pacific cod, grenadiers, rat tails, sablefish and hake
- Flatfish
- Rockfish

Rockfish

- All same genus – *Sebastes*, 102 species, ~96 in North Pacific and a ridiculous number included within the Groundfish FMP. They dominate deeper rocky reef habitat almost to the exclusion of all others.
- Similarities:
  - highly fecund live bearers – millions of babies but almost all die long before reaching maturity (starve, eaten by filter feeders, eaten by cogeners!)
  - dive for cover when threatened
  - painfully spiny
- Dissimilarities: (most important for DMRs)
  - Have filled multiple ecological niches from bait fish to benthic sit-and-wait predator to mid-water forager.
  - **Different species have very different life histories, growth and maturity, longevity, depth and latitudinal ranges, and susceptibility to barotrauma.**

Gratuitous rockfish photo

The 2014 Goal

- Reduce the fishing mortality attributed to fish caught and subsequently released using a descending device, in catch accounting.
- Retain recreational access and recover some lost under three rebuilding plans
  - Depth limits
  - Closed areas

First DD DMRs in use

- In April of 2013 the PFMC first adopted descending device based DMRs for 3 overfished species whose TACs were low enough incidental catch with a zero bag was severely restricting access to other co-occurring species.
- Industry support for the supporting field work.
- GMT support in analyses.
- Implemented for cowcod, yellow eye and canary rockfish in 2014

Cowcod example from a 2014 GMT report

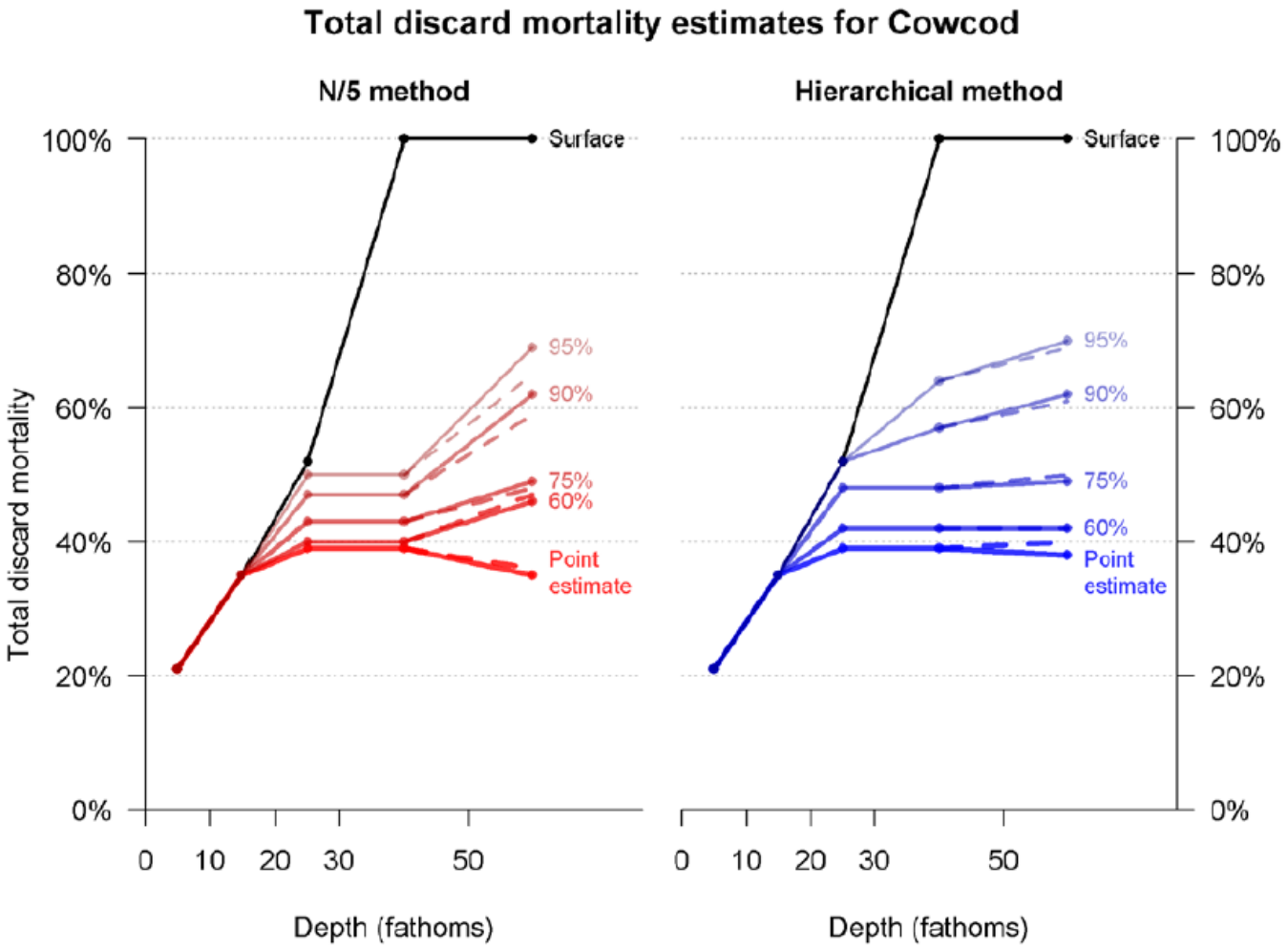

Figure 3. Total discard mortality (%) estimates by depth bin for cowcod at the surface and reflecting the use of descending devices incorporating short-term mortality, long-term mortality, unaccounted for mortality and upper 60, 75, 90, and 95 percent confidence intervals as precautionary buffers for uncertainty. Short-term mortality estimates are calculated by both the N/5 method (left panel) and the hierarchical method (right panel) Dashed lines reflect estimates from additional data made available since April 2013 from the acoustic tagging study.

2022 Guild-based DD-DMRs

- Other species become constraining, cowcod, canary rebuilt to target, yelloweye almost there.
- At the behest and encouragement of the GAP, by 2022 the GMT had analyzed a guild-based approach to applying recreational DD-DMRs to all rockfish species in the FMP
- Guilds
  - Pelagic
  - Demersal
  - Dwarf
- Guild-based DD-DMRs for other rockfish species without a species-specific DD-DMR adopted by PFMC Nov. 2022

Table 2. GMT recommended guild-specific depth-dependent cumulative mortality rates (in percent) with the use of descending devices based on the 80th percentile.

Depth Bin (in fm)	Pelagic Guild	Demersal Guild	Dwarf Guild
0-10	34% [c/]	9% [a/]	21% [b/]
10-30	34%	9%	67% [a/]
30-50	53%	30%	67%
50-100	92%	38%	100% [b/]
100+	100% [b/]		

[a/] Depth-dependent discard mortality based on guild-based estimate from the next deeper-depth bin with the use of a descending device.
[b/] Depth-dependent discard mortality based on the surface mortality rate.
[c/] Depth-dependent discard mortality based on the surface mortality rate for olive rockfish that had the highest pelagic surface mortality rate at this depth.

Table 3. List of the rockfish species or species complex within each rockfish guild that do not have species-specific cumulative mortality rates where the guild-based estimate from Table 2 would be used to estimate recreational discard mortality with the use of descending devices.

Guild	Rockfish Species or Species Complex
Demersal	Aurora, Bank, Black and Yellow, Blackgill, Blackspotted, Bronzespotted, Brown, Calico, Chameleon, China, Copper, Darkblotched, Dusky, Flag, Gopher, Grass, Greenblotched, Greenspotted, Greenstriped, Kelp, Mexican, Pacific ocean perch, Pink, Pinkrose, Puget Sound, Quillback, Redbanded, Redstripe, Rosethorn, Rosy, Rougheye, Sharpchin, Shortbelly, Shortraker, Silvergray, Speckled, Splitnose, Starry, Stripetail, Sunset/Vermilion, Swordspine, Tiger, Treefish, Yellowmouth
Pelagic	Blue/Deacon, Bocaccio, Chilipepper, Olive, Widow, Yellowtail
Dwarf	Dwarf-red, Freckled, Halfbanded, Harlequin, Honeycomb, Pygmy, Semaphore, Squarespot

Key takeaways:

- Foundational science on post-release survivorship using descending devices is critical.
  - Hardly mentioned here are the many studies done with, and independent of the charter industry that quantified post-release survivorship when descending devices were used.
- Supporting analytical science within the Council process is key.
  - Without the individuals within the PFMC Groundfish Management Team taking up the baton and moving the necessary analyses forward, none of this would have been possible.

Links to two GMT documents

- These two documents include embedded links to the previous work supporting the process
- Nov. ’22 PFMC H.4.a GMT 1&3

What's next?

- Commercial non-trawl open-access and limited-entry fisheries catch assumed retained or discarded dead.
  - Recreational assumes fish brought to the boat soon after being hooked and discards quickly released.
  - Some West Coast commercial open-access gears are similar to recreational and have live regulatory discards or are restricted from fishing where they might.

Thank you!

Questions?

SAC SPORTFISHING ASSOCIATION OF CALIFORNIA