

**HIGHLY MIGRATORY SPECIES MANAGEMENT TEAM REPORT ON
 SWORDFISH MANAGEMENT AND MONITORING PLAN HARDCAPS**

The Council has identified two preliminary preferred alternatives (PPA), Alternative 4 and Alternative 5 (California Department of Fish and Wildlife [CDFW] PPA) for hard caps on high priority protected species in the drift gillnet (DGN) fishery; final action is scheduled for September 2015. In its deliberations, the HMSMT queried the relationship between hard cap values and levels of observer coverage in the Alt. 5. Alternative 5 bases current cap levels on an expected 30% observer coverage. In Council deliberations the CDFW Council member specified that these cap levels can be “revisited” once observer coverage levels reach 100%, which suggests that at a future date (for example, before 2018, if the observer coverage PPA [Alt. 3] is adopted) the Council and advisory bodies would need to once again evaluate the suite of options applicable to the fishery. If the Council makes a final decision on a hard caps alternative at the current meeting, it could include a predetermined increase in hard caps once observer coverage reaches specified levels, without the need for additional Council (and advisory body) time and resources in the near future.

Alternative 5 calculates the entanglement caps by applying a 30% observer coverage rate to the cap levels from incidental take statement (ITS) and potential biological removal (PBR) values (Alt. 4), and rounding up to the next highest whole number. The Council could use this same approach to predetermine cap levels for higher levels of observer coverage. As examples, the HMSMT provides below comparable entanglement caps for 75% and 100% coverage. Table 1 shows the Alt. 4 cap levels on which Alt. 5 is based, as well as the current Alt. 5 caps (30% coverage), and possible Alt. 5 caps (based on entanglements rather than serious injury/mortality [SI/M]) for both 75% and 100% observer coverage. All the caps increase when observer coverage levels increase from 30% to 75%. Shaded cells indicate the only two caps which change when moving from 75% to 100% observer coverage.

Table 1. Possible hard cap values at different observer coverage levels based on hard caps identified in Alt. 4 and Alt. 5 (CDFW PPA)

| <i>Determination Basis</i> | Alt. 4 | Alt. 5 | | |
|------------------------------------|--------------------------|------------------------|----------|-----|
| | Extrapolated SI/M | Observed Entanglements | | |
| | <i>Observer Coverage</i> | All | 30% | 75% |
| Fin whale | 2 | 1 (0.6) | 2 (1.5) | 2 |
| Humpback whale | 2 | 1 (0.6) | 2 (1.5) | 2 |
| Sperm whale | 2 | 1 (0.6) | 2 (1.5) | 2 |
| Leatherback sea turtle | 3 | 1 (0.9) | 3 (2.25) | 3 |
| Loggerhead sea turtle | 3 | 1 (0.9) | 3 (2.25) | 3 |
| Olive ridley sea turtle | 2 | 1 (0.6) | 2 (1.5) | 2 |
| Green turtle | 2 | 1 (0.6) | 2 (1.5) | 2 |
| Short-fin pilot whale C/O/W | 5 | 2 (1.5) | 4 (3.75) | 5 |
| Common bottlenose dolphin C/O/W | 6 | 2 (1.8) | 5 (4.5) | 6 |

However, for 75% observer coverage, the resulting caps could be rounded differently than for 30% and instead of rounding any fractional cap up, those under 0.5 could be rounded down. This would affect the caps for leatherback and loggerhead turtle species by reducing each to 2 individuals. As a result, the change from 75% to 100% would affect 4 caps as opposed to two, making the 75% coverage level a more intermediate step.

The HMSMT recommends the Council consider whether the analysis of the current range of alternatives is adequate for selecting predetermined hard caps corresponding with increased observer coverage. If the Council would prefer including an analysis of potential hard caps at higher coverage levels in the Preliminary Draft Environmental Assessment before taking final action, this could be completed for a future Council meeting.

Determination of Future Observer Coverage Level

In response to the Council's request for determination of a level of observer coverage that balances the ability to identify rare interaction events with high priority species and the cost of observer coverage, the HMSMT discussed the need to assess possible future alternatives to the 100% level of observer coverage. To inform the requested determination of the level of observer coverage that is needed to detect these rare events, the HMSMT could utilize the techniques described in Martin et.al. (2015) which was recently reviewed by the SSC, who noted that the Bayesian framework could be used to conduct an analysis to evaluate observer coverage. However, that analysis would require information on bycatch rates and fishery effort, total bycatch limits (hard caps) and acceptable probabilities of exceeding those limit ([Agenda Item E.3, June 2015](#)). This analysis would greatly benefit from information gained through higher levels of observer coverage and provide a range of observer coverage levels from which the Council could choose.

Update from SWFSC on Leatherback Sea Turtle Research Activities

The HMSMT received briefings by SWFSC Marine Mammal and Turtles Division scientists, including by Dr. Alex Curtis on a forthcoming peer-reviewed journal *PLOS ONE* paper by her and fellow SWFSC scientists Dr. Jeffrey Moore and Dr. Scott Benson on limit reference points for leatherback sea turtles, and by Dr. Tomo Eguchi on his analysis of leatherback sea turtle movement inside the Pacific Leatherback Conservation Area. The methodology used in the Moore and Curtis paper to estimate limit reference points develops a local limit (as opposed to a population-wide limit), based on the abundance of animals that occur in a defined area (in this case, the U.S. West Coast EEZ) and the fraction of the year they occur there. The corresponding local limit estimates developed in the paper are thus applicable to the U.S. West Coast EEZ rather than to the entire Western Pacific leatherback population which ranges outside the EEZ.

This analysis assumes that the limits would apply to all fisheries with leatherback sea turtle interactions, including non-U.S. fisheries with population impacts. The range of management strategy evaluation scenarios analyzed in the paper do not consider the effects if the U.S. unilaterally adopted management measures for leatherbacks without commensurate action by other international fisheries with leatherback turtle population impacts. Therefore, the HMSMT does not believe this work is directly applicable to the proposed action.