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## Reducing Unintended Catch of Bigeye Tuna near FADs

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Fishes in all oceans of the world associate with floating objects ranging from drifting ice, drift algae, logs, and bobbing coconuts to discarded plastic debris. In tropical waters, many tons of tuna as well as sharks, billfish, mahi mahi, triggerfish and other species aggregate around such flotsam. Commercial and recreational fishermen have long capitalized on this phenomenon. The use of Fish Aggregation Devices (FADs), floating objects deployed to attract fish for their subsequent capture, is increasing and in the eastern Pacific Ocean more than 30% of the commercial tuna purse seine catch now come from sets on fish associated with floating objects. Because juvenile bigeye tuna are particularly plentiful around drifting objects, this practice has inadvertently contributed to the depletion of bigeye stocks in the Pacific Ocean.



School of bigeye and skipjack tuna  
Credit: Pete Nelson

To reduce the unintended capture of small bigeye tuna, colleagues from the Inter-American Tropical Tuna Commission (IATTC) and I recently conducted a series of behavioral experiments on captive tunas at the IATTC laboratory in Achotines, Panama. The intent was to identify important characteristics of a sorting grid that could be incorporated into a net, allowing the escape of small fishes while retaining larger, commercially valuable fishes. We sought clues to designing a sorting device that fish would use readily and tested a secondary device that may be useful in herding fish within a seine towards a sorting grid.

First, we collected data on the relative height and width for yellowfin tuna (*Thunnus albacares*) from the eastern tropical Pacific

Ocean. Small yellowfin are comparable in width and height to small bigeye, and they are easily available in the waters near the IATTC lab, while bigeye are not. We used this morphometric data to aid in the design of experimental versions of our sorting grids. We investigated the behavioral response of captive yellowfin to these grid designs, comparing the frequencies with which yellowfin tuna passed through one of two sorting grids, while varying the color, orientation and design of a rigid grid design.

We learned that a vertical orientation and white coloration increased the frequency with which tuna passed through the grids. A transparent PVC panel with oblong holes, similar to those used in an experimental salmon purse seine fishery, was also readily traversed by fish. An array of rigid rings sewn directly into purse seine webbing performed comparatively poorly. We also found that our tuna could not be induced to pass through a wall of bubbles; we hope that such a device may be of use for crowding tunas within a purse seine and into contact with a sorting grid.

We would like to determine the importance of the visual contrast presented by our gear in future lab experiments, and look forward to trials at sea. These devices may offer a partial solution to bycatch issues in the tuna purse seine fishery. Clearly, design characteristics including color and orientation should be considered in future efforts towards developing bycatch reduction gear for tuna purse seine fisheries.



Sorting grid; note escaping tuna  
Credit: Pete Nelson

## New Zealand Study Tour Site Launched

Christopher M. Dewees

In March 2006, Marine Fisheries Specialist Chris Dewees organized a tour of 20 fisheries leaders to New Zealand. Participants came from the Pacific, Gulf of Mexico, and New England coasts and had an opportunity to closely examine New Zealand's 20-year experience with individual transferable quota (ITQ) management of marine fisheries. The tour was funded by the Gordon and Betty Moore Foundation, Alex C. Walker Foundation, The Bradley Fund for the Environment of Sand County Foundation, and California Sea Grant.



Group photo of New Zealand tour participants  
Credit: John Stumbos

Obviously, the number of people participating was limited by funding and logistical practicalities. We realize that many other people wanted to participate and still more are curious about the New Zealand approach. To further extend what was learned on the study tour, we have launched a website, <http://www.nzfishtour.ucdavis.edu> that provides access to much of what the study tour group experienced.



Banner graphic from New Zealand  
Fisheries Study Tour Site  
Credit: Valerie Griffith



Auckland Auction: Tour participants at the market  
Credit: John Stumbos

The site has a wide range of topics, including:

- New Zealand marine fisheries background and historical observations;
- study tour itinerary;
- tour participants with contact information to learn more;
- even downloadable presentations heard by the group;
- news stories about the tour
- links to New Zealand fisheries organizations
- photo gallery.

The site will be updated periodically as new materials become available. Study tour participants have been conducting outreach programs related to dedicated access privileges here in the United States. Feel free to contact Chris Dewees, [cmdewees@ucdavis.edu](mailto:cmdewees@ucdavis.edu) or the tour participants for further information.



Robin Hapi and tour group  
Credit: John Stumbos

## Marine Fisheries Updates

Christopher M. Dewees

### Abalone

The California Fish and Game Commission received a request to consider re-opening a small test fishery for red abalone at San Miguel Island. Commercial and recreational take of abalone has been closed south of San Francisco since 1997 due to extremely low abalone populations. The Commission recently approved the Abalone Recovery and Management Plan. Amendment 8 of the plan allows for test fisheries before the stocks are fully recovered in the southern half of the state.



Red abalone  
Credit: Chris Dewees

In response to the request, the Commission asked that a survey be conducted of the abalone resources of the Island and that an Abalone Advisory Group be appointed to examine the feasibility and details of the proposed fishery. The California Department of Fish & Game (CDFG) and commercial abalone divers worked collaboratively to develop a survey protocol that was reviewed by scientists. In August 2006 more than 50 divers from commercial and recreational dive organizations, CDFG, universities and other agencies conducted a "snapshot" survey of red abalone populations at San Miguel.

Preliminary results of this large collaborative effort were reviewed at a December workshop held at UC Santa Barbara by CDFG biologists with additional analysis by Australian fisheries scientist Dr. Jeremy Prince and Marine Fisheries Specialist Chris Dewees. The participants, including scientists, commercial and recreational divers and others, discussed the survey results as well as alternative management approaches and issues to be considered if a test fishery were allowed to proceed. For further information, contact John Ugoretz, CDFG [jugoretz@dfg.ca.gov](mailto:jugoretz@dfg.ca.gov) or Abalone Advisory Group Clerk Alicia Bonnette, [fluidblue@att.net](mailto:fluidblue@att.net).

### Sea Urchin

The California Ocean Protection Council (COPC) recently approved funding of a proposal by the San Diego Watermen's Association to continue development of a harvesting cooperative and local co-management of that area's sea urchin fishery. The project includes an ongoing resource monitoring program, business planning, and organization of

local sea urchin divers and processing activities. For further information contact Peter Halmay, [phalmay@earthlink.net](mailto:phalmay@earthlink.net).

### Groundfish Trawl Fishery

The Pacific Fishery Management Council is proceeding with development and analysis of dedicated access privilege (DAPs) alternatives for the Pacific coast trawl fleet. Their goal is to have the plan details decided upon in 2008 with implementation by 2010. Discussions are ongoing about key issues such as initial allocation of quota shares, bycatch of species with low abundance, gear switching, community issues, aggregation limits, and enforcement.

For further information contact the Pacific Fishery Management Council, <http://www.pcouncil.org>.

### Ocean Protection Council

Much of the California Ocean Protection Council (COPC) November 28 meeting focused on marine fisheries issues. A panel provided the COPC with an update on some new fishery management issues and approaches. In addition COPC:

- Approved \$3 million for future "innovative fishery management" projects;
- approved \$8 million for Department of Fish and Game marine resources programs;
- concurred with research projects selected for funding by California and USC Sea Grant programs with COPC funding;
- approved \$2.375 million to fund a California Sea Grant call for proposals related to the monitoring of Marine Protected Areas (MPAs).

For further information check out the COPC site, <http://resources.ca.gov/copc>.

## Newsletter Evaluation

We have been publishing this fisheries newsletter for several years, and we would greatly appreciate your advice and comments. If you receive a hard copy of this newsletter by mail, please fill out and return the enclosed brief postage paid questionnaire. If you receive the newsletter electronically, please go to the survey link below to complete the questionnaire:

<http://ucce.ucdavis.edu/survey/survey.?surveynumber=1657>

Thank you.

Christopher M. Dewees



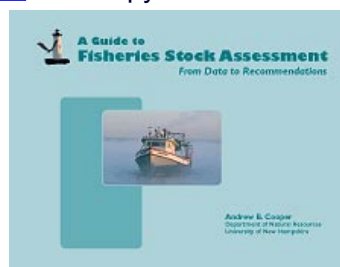
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# Sea Grant Fisheries

## Stock Assessment Guide Christopher M. Dewees

The often intimidating field of stock assessment is the topic of a new extension bulletin published by New Hampshire Sea Grant. "A Guide to Fisheries Stock Assessment: From Data to Recommendations" by Andrew B. Cooper is written clearly and is well illustrated. In 44 pages, Cooper covers data collection, biological reference points, population dynamics models, applying stock assessment to data, and making recommendations. We have a few copies here at Davis. Contact Janelle Kohl at 530-754-7476, [jmkohl@ucdavis.edu](mailto:jmkohl@ucdavis.edu) for a copy.



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