Division of Aquatic Resources
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Key **Online** Benefits:

- File commercial fishing reports
- Purchase/renew commercial fisheries licenses and permits
- Register bottomfish vessel

Contact Information:
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Division of Aquatic Resources
Hawaii Department of Land and Natural Resources

Dear Commercial Bottomfish fishers and dealers-Please let us know what kind of information is useful to you. We welcome your feedback! Any feedback about the newsletter, positive or negative, is greatly appreciated! PLEASE CALL statistical staff member, Jessica Miller, (808) 587-0594 or e-mail dlnr.ar.bf@hawaii.gov. Mahalo! - DAR Statistical Unit

Thank you to everyone for your ideas and assistance in editing the Bottomfish Newsletter Volume 14! A special thanks to: Caitlin Burgess, Francis Oishi, Reginald Kokubun, Eric Yokomori, Jeffrey Drazen, Dana Sackett, Ana Vaz, and Cordelia Moore .

Editor: Jessica Miller

BOTTOMFISH NEWS

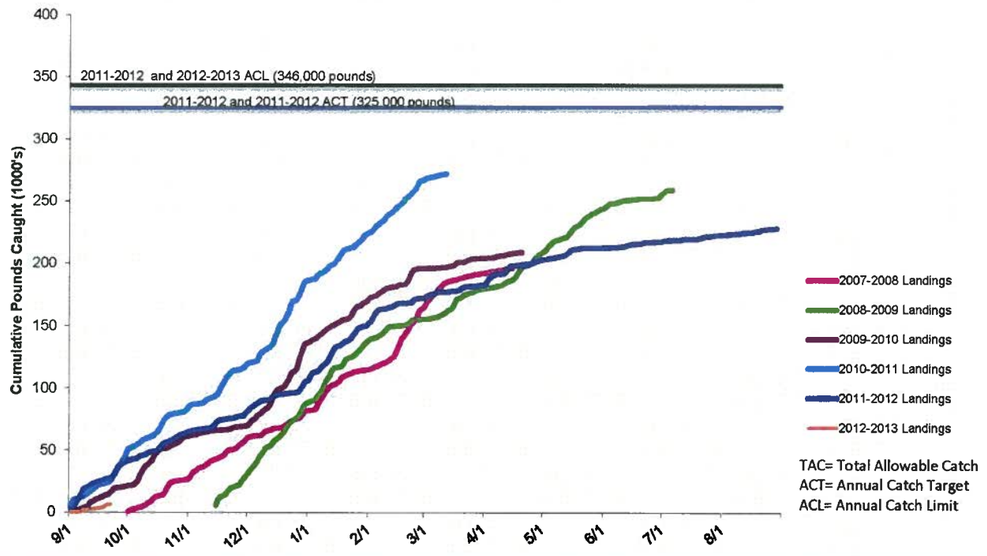
Volume 14

October 2012

Summary of the 2011-2012 MHI Deep 7 Bottomfish Fishing Year

The 2011-2012 bottomfish fishery closed on August 31, 2012. 228,388 pounds of Deep 7 bottomfish were reported landed (70.3% of the 325,000 pound Annual Catch Target (ACT)). A total of 468 fishers reported 3,075 Deep 7 bottomfish trips. This is the first year since catch limits began in 2007 for the Deep 7 Bottomfish fishery that the fishery remained open the full year. Many fishers credit weather as the major factor that prevented the ACT from being reached in 2011-2012 fishing year. The 2012-2013 fishery opened on September 1, 2012. Sixty commercial fishers have reported making 105 Deep 7 bottomfish trips and landing 6,411 pounds of Deep 7. (Data as of September 25, 2012.)

Comparison of MHI Deep 7 Bottomfish Landings from 2007 to Present with current catch limits (as of 09/25/2012)



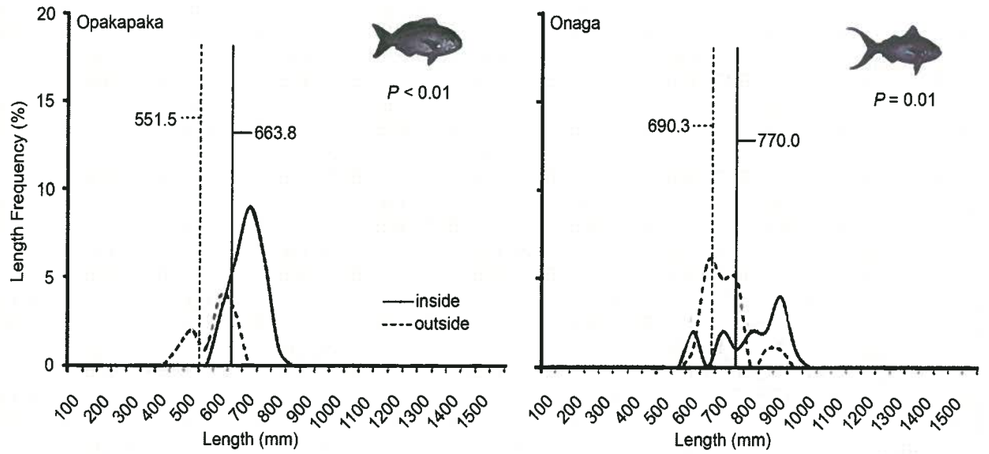
7th Annual Hawaii Fishing and Seafood Festival

Don't miss the Hawaii Fishing and Seafood Festival on Sunday October 7, 2012 from 9am-4pm. It will be at the Honolulu's Fishing Village at Pier 38. For general information please visit their website, http://www.hawaiifishingfestival.com/. The festival has over 100 vendors and fun for the whole family. This year the Deep 7 Hawaii Bottomfish booth will have information about current Deep 7 Bottomfish research along with scientists on hand to answer questions regarding their research. Deep 7 monitoring staff will also be on hand to answer questions regarding reporting.

Bottomfish Restricted Fishing Areas and the deep 7: a report of current monitoring results.

In 1998, the State of Hawaii, Department of Land and Natural Resources implemented 19 BRFAs throughout the Main Hawaiian Islands (MHI). Because of new information on bottomfish and their habitat the system was substantially revised on June 1, 2007. The new system of BRFAs reduced the overall number to 12, but increased the area protected to include more Essential Fish Habitat (those areas necessary for fish feeding, growth to maturity or spawning) for bottomfish. The state's goals were to increase the size and abundance of bottomfish inside the reserves with the long term goal of realizing spillover to neighboring fished habitats and higher production of eggs and juveniles from larger fishes. Monitoring of the new BRFAs was mandated by the state to determine their effectiveness. This monitoring was tasked to Dr. Jeff Drazen's lab at the University of Hawaii. While other successful marine reserves have measured increases in fish abundance and fish size as a result of protection, bottomfish in the MHI, can live up to 40 years and can take nearly a decade to reach maturity; so benefits from these BRFAs may take a while to detect. However, after examining nearly four years of data we are starting to see some positive benefits as a result of the BRFAs.

Relative abundance and fish size have often been monitored using data collected from fishing (i.e. catch totals or CPUE). However, fishing was not a viable method inside of the BRFAs. Instead we used a baited camera system (BotCam), designed specifically for monitoring Hawaiian bottomfish and their habitat. Fish can be identified, counted and the system allows precise and accurate length measurements. Measuring relative abundance is important because it can tell us whether bottomfish populations are changing over time as a result of protection. Also because large females contribute most of the eggs for the next generation of fish, increases in fish size as a result of protection can have a big impact on recruitment and the size of bottomfish populations in the future.



Graphs showing a significant increase in the average length of opakapaka and onaga inside versus outside the Ni 'ihau BRFA.

Results have shown significantly larger opakapaka and onaga inside the Ni 'ihau BRFA compared to outside. This particular BRFA had been protected for ten years; since the inception of the original BRFAs in 1998. Interestingly, the increase in fish size within the BRFA was equivalent to 10 years of growth. In contrast, the Hilo BRFA had significantly smaller opakapaka and kalekale within the reserve compared to out. These results are likely because (1) the shallow depth range (< 100 fathoms) of this BRFA was not protected prior to 2007; this is particularly important for opakapaka, which most often reside within this shallower range, and (2) the areas outside the BRFA to the south have limited accessibility possibly creating a natural reserve. Indicative of the potential success of the BRFAs, monitoring results from the Kaho'olawe Reserve (KIR), which was established in 1994, has shown significant improvements in bottomfish diversity, fish size, and an increase in the proportion of mature fish within the reserve.

Bottomfish Restricted Fishing Areas and the deep 7: a report of current monitoring results (cont.)

An image from BotCam of a school of opakapaka.

More recently, we have been examining fish size and abundance over time. This type of analysis tells us whether fish size and abundance are changing over time as a result of protection or whether our results have always been there (for example if there have always been large fish in the BRFAs). So far, our results show an increase in the size of ehu and onaga inside the BRFAs as a result of protection. We also found that the size of opakapaka and kalekale has increased inside and outside the BRFAs. Although, we found higher fish abundance inside many of the reserves compared to out, this has not changed over time.

One of the many benefits of areas with populations of large fish is that older and mature individuals tend to produce higher quality eggs and more of them when compared to younger fish of the same species. Fish eggs and larvae are small in size and have limited swimming capabilities, so ocean currents can help transport these small organisms. Contribution to the rebuilding of fishing populations is contingent on the offspring of large fish staying or being transported to good habitat. A recent study at the University of Hawai'i (Ana Vaz) simulated the dispersal of eggs and larvae from three of the Deep-7 fish species (opakapaka, ehu and onaga). Results indicate that eggs released inside BRFAs in the MHI are very likely to be transported to areas open to fisheries. Study results also indicate that eggs released in the area between Hawai'i and O'ahu stay in this region, while eggs released around Kaua'i, Ni'ihau, Ka'ula and Middle Bank stay around the MHI and are exported to the Northwestern Hawaiian Islands. However, eggs spawned in the Northwest Hawaiian Islands do not contribute to the MHI populations of bottomfish.

These results suggest that the BRFA system is protecting larger fish, which could lead to increased recruitment and ultimately increases in bottomfish abundance. However, help is needed from our local communities to protect our important bottomfish resources. We all have the same goal, to continue the harvest of bottomfish for generations to come; if we work together in protecting these small refuges so that bottomfish can eat, grow and contribute to larger future populations of bottomfish, the fishery as a whole will benefit.

Dana Sackett, Jeffrey Drazen, Ana Vaz, and Cordelia Moore - University of Hawaii