

BLNR Hearing  
DATE: April 26, 2024  
TIME: 9:00 a.m.  
PLACE: DLNR Boardroom,  
[blnr.testimony@hawaii.gov](mailto:blnr.testimony@hawaii.gov)

Testimony In Support of DAR F.3. “Statewide Marine Resources Assessment.”

Earth day! Support sustainable highly renewable valuable fisheries and their very important economic contributions to Hawaii. I highly suggest you also utilize fishers in a working group to aid this stock assessment. To maintain fisheries sustainably and maximize their contributions for the economic benefits to the state we must understand our stocks; so **funding DAR on this is more essential than any other Earth Day topic you will address!**

Key to lowering the huge carbon footprint of the most isolated populated area in the world is using our renewable resources to their maximum potential while maintaining sustainability. While tourism is essential to our economy it is not sustainable, it is vulnerable, and it is Hawaii’s largest carbon footprint source.

The most valuable and most sustainable ecologically friendly fishery in Hawaii is the aquarium fishery. **You had questions here are the answers:**

- 1. DNA Genetic diversity and Hawaii fisheries.**
- 2. Humane Survivability of Aquarium Fishes**

**The idea that DNA genetic diversity in Hawaii’s aquarium fishery is significantly affected does not hold water scientifically.** If overall populations were declining, deeper reserves, and statewide populations were affected then DNA diversity can be impacted. But Hawaii’s aquarium fishery shows population increases not declines.

Marine species from deeper areas can come in to repopulate. Many species like yellow tangs can be found at depth exceeding 200 feet deep and many collected fish live in ecosystems as deep as 600 feet deep. Also baby fry return to Hawaii’s reefs at very deep depths then slowly migrate to the shallows.

All of Hawaii's collected marine fish species are broadcast breeders. Fish thousands of miles away can contribute new DNA to fish populations. Many of Hawaii's fish species came in on ocean currents from Japan 4000 miles away. Breeding biodiversity in areas where fishing occurs is not affected because of deeper "**Deep Refuge**" areas hold reserve marine fish in uncollected areas. Fish are not monogamous and breed in groups creating more biodiversity than other species.

In areas where aquarium fish collection occurs both on Oahu and in West Hawaii closed to fishing reserves provide a source for new genetic biodiversity. Fish migrate along the coast and many species have migrated hundreds of miles in search of food even between Islands.

**Larger breeder fish, and smaller fish, provide DNA sources that remain in collected areas, only medium fish are collected, to ensure long term biodiversity of DNA.**

**Conclusion: Multiple sources of fish for renewed DNA biodiversity are available to ensure reef fish genetic biodiversity countering the harvest in Hawaii aquarium fish collection.**

## **Survivability of Aquarium Fishes**

**Why is it OK to Kill a fish but not OK to keep the same fish in an Aquarium?**

**“fish can and do live much longer lives in captivity than in the wild, not surprising given the absence of predators (in most cases), the unlimited amount of food available and the lack of disease.”** Link to full article:

<https://reefs.com/magazine/aquarium-fish-longevity/>

**The Emily Munday study followed 200 yellow tangs from West Hawaii for two years and there was %100 survivability.**

As far as aquarium related mortality in Hawaii goes here's a quote from a Cesar 2002 study **“Mortality rates of aquarium fish are low and have gone down considerably since the last survey in 1984. Currently, mortality rates from collection to wholesaler are estimated at 0 to 1 percent.** In the wholesalers tanks, mortality rates range from close to 0% up to 2%. During shipment, rates range from 0.75% to 2%. This give a current total of between 1% and 5%, down from a range of 5% to 8% in the early 1980's (van Poolen and Obara, 1984; estimates of wholesalers and collectors, own study).” Dr. DAN A. POLHEMUS

Division of Aquatic Resources Full research Ceaser 2002, and "Ornamental reef fish aquaculture and collection in Hawaii." in the sources below.

## **Genetic Sources:**

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## **Sources: Humane Treatment Survivability of Aquarium fish.**

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From: [Dan.A.Polhemus@hawaii.gov](mailto:Dan.A.Polhemus@hawaii.gov)

Date: December 23, 2009 8:25:16 AM HST

To: Rene Umberger

Subject: Re: Your quote is being used is it accurate?

Hi Rene,

Thanks for the dialog. Let me see if I can address your questions.

First regarding underreported aquarium catch. Unfortunately there hasn't been a comprehensive study of whether there is substantial underreporting in the aquarium fishery (or any other fishery). The numbers I've cited in the past (2X unreported catch) are based on two previous studies of the Hawaii aquarium fishery. I have attached the reports for you. This is the best information that's available. Given human nature it wouldn't be surprising that some level of underreporting occurs but there is no information anywhere to support anything like the 10X figure which I've heard mentioned. Furthermore when we've compared the number of animals caught, as reported by collectors on their fish catch reports, with the numbers purchased by dealers there isn't any indication of gross underreporting by the collectors.

As far as aquarium related mortality in Hawaii goes here's a quote from a Cesar 2002 study "Mortality rates of aquarium fish are low and have gone down considerably since the last survey in 1984. Currently, mortality rates from collection to wholesaler are estimated at 0 to 1 percent. In the wholesalers tanks, mortality rates range from close to 0% up to 2%. During shipment, rates range from 0.75% to 2%. This give a current total of between 1% and 5%, down from a range of 5% to 8% in the early 1980's (van Poolen and Obara, 1984; estimates of wholesalers and collectors, own study)."

**I haven't seen any work to support the figure of 99% mortality rate within one year for captive marinelife.** For animals which have been collected using cyanide this may not be unrealistic and there is good work on such chemical related mortality. The aquarium fishery in Hawaii does not use destructive chemicals. The 2007 statistic cited indicating that 20,000 reef animals died while in the

possession of collectors seems to be based upon comparing what collectors report as being caught vs. what's sold. In 2007 this difference was 20,345 animals statewide. A closer examination of the catch report data reveals that of that total figure, 6,000 or so were miscellaneous shrimp, most likely opae ula, which were being harvested in fairly large numbers around that time. We don't know why such large number of shrimp were caught and not sold. They may have been used for fishing purposes or to feed aquarium fish. They're pretty hardy animals so this difference may not represent collector related mortality but a redirected use.

Another interesting component of the reporting that year was a single monthly report in March 2007 that indicated a catch of 8,897 yellow tangs by a Big Island collector. Of these only 850 were reported sold. This seems to be an unrealistically high reported catch for a single collector in one month not to mention in March, months before settlement of the young, more collectible, tangs occurs. We checked the actual report and there was a data entry error. It should have been 897 caught (not 8,897). Thus the total FY 2007 difference between #'s caught and sold is actually 12,345 of which almost half were miscellaneous shrimp. For FY 2009 we see that there was a difference of about 18,000 in the number reported caught and sold. 16,000 of these were opae ula. The difference in yellow tangs reported caught and sold was 2,233, which if it does represent mortality, **suggests a collector to dealer mortality of 0.8% - quite similar to what Cesar found.**

It is a good thing for folks to scrutinize and ask questions about what's going on in our fisheries and on our reefs. These are important to all of us. A realistic perspective does need to be maintained however. Let me elaborate. On Maui in 2009 there were a total of 16,300 aquarium animals caught, representing 82 different species. Yellow tangs accounted for 69% while Kole was 7% of the catch. During that same year non-aquarium commercial fishers captured (and killed) 319,491 reef fishes of 75 species. While yellow tangs weren't caught to any degree there was considerable overlap in a number of the other species. To the commercial food catch one can add another 480,000 reef fish taken by recreational/subsistence fishers (extrapolated from 2006 NOAA Rec Fishing Survey data). So, in the grand scheme of things, the aquarium take on Maui is literally a drop in the bucket, representing less than 2% of the total mortality of reef animals that year. This serves to point out that undue focus and hyperbole about aquarium collecting and its impact on the reefs is dangerously shortsighted and counterproductive. We need to think and act holistically.

Hope I didn't overwhelm you with numbers.

- Dan Polhemus

Dr. DAN A. POLHEMUS

Division of Aquatic Resources

State of Hawaii DLNR

1151 Punchbowl St.

Honolulu, HI 96813

Phone: (808) 587-0100

e-mail: [Dan.A.Polhemus@hawaii.gov](mailto:Dan.A.Polhemus@hawaii.gov)