



NOAA Teacher at Sea
Margaret Flanagan
Onboard NOAA Ship OSCAR ELTON SETTE
June 12 – July 12, 2007

NOAA Teacher at Sea: Maggie Flanagan

NOAA ship OSCAR ELTON SETTE

Mission: Lobster Survey

7 July 2007

Necker Island

Project Log – Bycatch

Though spiny and slipper lobsters are our target species for sampling, many other interesting creatures are interested in our bait, and wind up in our traps. Some of the smaller creatures spend a little time in our on board aquarium for observation and acclimation. These

fish are upside down because their swim bladders, which regulate buoyancy in the ocean, have not yet adjusted to the surface (barotrauma). They wouldn't survive if they were immediately released.

The turkeyfish, aka Hawaiian lionfish, *Dendrochirus barberi*, is

red/orange with large fins. It has venomous spines in its dorsal (back) fin,

and will lunge pointing them at a threat. We used a net instead of gloves to observe this one. This fish is known to enjoy a meaty diet, eating other smaller fish.



A turkeyfish and white spotted toby found in lobster traps.

The Hawaiian white spotted toby, *Canthigaster jactator*, is a sharp nose puffer, brown with white spots. This toby is endemic to Hawaii, found naturally only in Hawaii. These fish can make themselves swell in size to ward off predators by filling their stomachs

with water. They carry a toxin in their skin, which can harm other aquarium creatures if released.

The red figure in the background of the above photo is a sea hare, *Aplysioidea*, aka sea slug. These invertebrates are hermaphroditic, carrying both male and female sex organs.

We also encounter a variety of crabs with a variety of adaptations. Hermit Crabs, *Dardanus*, have been the most numerous in our traps, and there are reported to be up to 2000 species of hermit crabs world-wide. They take over the shells of marine snails and



Swimming crab (*Charybdis paucideutis?*) and hermit crab (*Dardanus brachyops*)

keep their soft abdomens tucked inside. Many of the hermit crabs we've found in the North West Hawaiian Islands take protection even one step further - they keep anemones on their shells. The anemones eject bubble-gum-pink stinging threads called acontia when threatened. We wear gloves when handling the crabs to protect ourselves. Scientists have discovered that the anemones don't live on the shells when

the snail is alive, and that hermit crabs will actually move their anemones from shell to shell as they move to new shell homes. They figure that the anemones benefit from mobility with the crab and from food particles spread by the hermit crabs as they rip and shred.

Swimming Crabs, *Charybdis*, are the most aggressive crab in the trap. In both body and behavior they're similar to the blue claw crabs of my home waters, so I was prepared for their quick attempts to pinch and slice my fingers. Their last pair of legs is oval like a paddle – perfect for swimming.

On board, we call the box crab, *Calappa calappa*, the Vader crab. Its claws fold perfectly into its oval body, making it look like the face mask of that notorious space villain. These crabs can be mean too; those wide claws are powerful and help the crab eat mollusks. Imagine how well camouflaged it is folded up in the sand.

Personal Log

During our lobster survey work, we catalogue the other animals that also get in the traps, and release them as healthy as possible. The creatures that you catch unintentionally are generally called bycatch. A current issue in commercial fishing

is animals killed and wasted because they're caught as bycatch, and not sold or eaten. Many times they're dumped back in the sea dead. It's a complicated issue on a global scale considering the definitions of what makes bycatch, all the different kinds of fishing gear, the variety of marine ecosystems, applications of technology, and the multiple political and economic groups involved. There are many figures being reported, from 30% to over 50% of the take winding up as wasted bycatch, or perhaps 28 million metric tons world-wide. But, statistics on this topic are difficult to determine, which makes solving the problem even more difficult. Technology has innovated some fishing gear which particularly reduces the bycatch of sea turtles and marine mammals, and recent focus on bycatch by type of fish and type of gear may inspire more solutions to this serious problem.



A box crab (*Calappa calappa*), a.k.a., the Vader crab