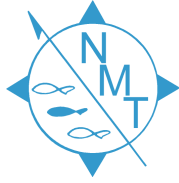


NMT Network News

Northwest Marine Technology, Inc.



Fall 2002

New Zealand Researchers Identify Long-Term Fidelity of Snapper Within A Marine Reserve

The snapper *Pagrus auratus* fishery is one of the largest and most valuable coastal fisheries in New Zealand. The snapper are managed as four distinct stocks with the largest being the north-eastern New Zealand stock (SNA 1). Catch quotas are used to regulate this economically important fishery. The 1997 TAC (total allowable catch) and the TACC (total allowable commercial catch) for SNA 1 were set at 7,500 ton and 4,500 ton, respectively.

Tagging, including the use of Coded Wire Tags and PIT tags, has been used to estimate snapper biomass. Snapper are caught by long line and then tagged on chartered vessels. The tag recovery effort includes the scanning of landings with handheld detectors. It is estimated that the current snapper biomass is below the theoretical biomass at maximum sustainable yield, and the stock requires rebuilding to reduce the risk of collapse.

Implementation of marine reserves has been offered as a management tool to lower the risk of collapse. Several scientists predict that recovery within reserves is likely to be most pronounced in species with limited movement. Unfortunately, previous research on snapper movements was conducted using commercial and recreational fisheries that resulted in a single observation for individual fish. To examine small-scale movements of snapper, Trevor Willis, from the University of Auckland, initiated a study to track snapper movements in and around the Leigh Marine Reserve using Visible Implant Elastomer (VIE) fluorescent tags. The Leigh reserve was established around Goat Island in 1975 and encompasses roughly 5 km of shore line, extending 800 meters offshore.



Trevor used VIE tags to identify individual snapper. Because snapper have difficulty evacuating their swim bladders as they are brought to the surface, the decision was made to VIE tag the fish underwater. Divers used a short hand line with barbless hooks to capture snapper. The fish were immobilized in knotless nylon netting and VIE tagged between the dermal layers of the caudal fin lobe without being brought to the surface. Snapper exhibit a diver positive behavior that was conducive to resightings.

Photo: Diver tags snapper using NMT's Visible Implant Elastomer

...Continued next page

....Continued from previous

New Zealand Snapper

Of 117 snapper tagged with individual VIE implants, 49 (42%) were resighted and positively identified during the study. No resighted snapper were more than 500 meters from their tagging site. Although it is impossible to know movements between diver observation dates, tagged fish were usually resighted in very specific locations, suggesting fidelity to relatively small home range. A number of tagged snapper were observed occupying or returning to the same area for over three years.

Strong site fidelity increases the probability that marine reserves will be effective. The fact that the snapper tend to exhibit sedentary behavior increases the likelihood that reserves will protect spawning aggregations. This observational study using VIE tags helps explain why the density of snapper in Leigh Marine Reserve are 2 times higher than adjacent areas where fishing is allowed.

To learn more about this project contact: Trevor Willis, PhD email: t.willis@auckland.ac.nz



SUMMARY OF PROJECT SEAHORSE WORK

Project Seahorse is a team of biologists and social workers committed to conserving and managing seahorses, their relatives and habitats, while respecting human needs.

Keith Martin-Smith - Australia

Ex-situ VIE Trials on the Australian Big-Bellied Seahorse

Australia has the highest diversity of seahorses, seadragons and pipefish in the world. There has been extensive interest in these animals as flagship species for marine conservation, particularly for highlighting the issues of habitat degradation, incidental bycatch in non-selective fishing gear and aquaculture. Research on such topics often requires individual or batch identification of animals. Tagging of seahorses has been problematic but Visible Implant Elastomer (VIE) has the potential to address many of the problems with previous methods. Obviously, tagging should not adversely affect survival or growth of animals and tags should have high retention and detection rates. These issues should be assessed in controlled situations before field studies are attempted.

Thus, in collaboration with Chris Woods of NIWA (National Institute of Water & Atmospheric Research) in Wellington, New Zealand, I undertook a quantitative experiment on the effects of VIE tagging on seahorses. We used the big-bellied seahorse, *Hippocampus abdominalis*, as it is the focus of my research in Tasmania as well as being the target of aquaculture operations in both Australia and New Zealand. We tagged small seahorses and held them with control (non-tagged) animals for seven months. Tagging was very successful with no mortalities, no significant effect on growth and retention of all tags. Some of the tags were difficult to see with the naked eye but all were visible under fluorescent light. The work is being written up as a scientific manuscript that we hope to submit soon.

More from Project Seahorse....

Sian Morgan - Philippines

In Situ Use of VIE in the Tropical Tiger-tailed Seahorse

There is an extensive fishery for seahorses in the Philippines; where animals are sold live into the aquarium trade and dried as both marine medicinals for traditional Chinese medicine and as curios for export. In the central Philippines *Hippocampus comes* makes up >85% of most seahorse catches where 3 other species (*H. kuda*, *H. spinosissimus* and *H. kelloggi*) are also fished. In a survey of catch rates from 1985 – 1995 in Bohol province, numbers decreased by 90% indicating a serious need for the careful management of seahorses populations.

My research is focused on providing information on dispersal – one of the parameters needed in order to understand how to design a sustainable fishery for seahorses and effective marine protected areas. One aspect of my work was to look at movement in adult populations of the nocturnal *H. comes*. In April of 2001 I established a 2400m² grid in a sanctuary on a small island north of Bohol, where I took nightly fixes on the positions of 21 animals. All animals were initially necklace tagged, then later 14 of the seahorses were given double elastomer marks, while the remaining 7 were left as unhandled controls. Animals were removed briefly from the water while being tagged, then returned immediately to their holdfasts where they showed no undue signs of stress. At present we have lost one of the two marks in approximately 1/3 of the animals, but only one individual has lost both marks. Some marks have become more difficult to see with time under white light, but under fluorescent light there has been little deterioration in visibility. These preliminary results differ from the high retention rates seen in other studies of seahorse populations. In order to clarify whether loss was due to poor marking technique, or the species in question (which is very bony and sometimes very difficult to inject), I hope to perform repeat marking on the same population over the winter of 2002.

Janelle Curtis - Portugal

In Situ Use of VIE in European Seahorses

Both the long-snouted *Hippocampus guttulatus* and the short-snouted *H. hippocampus* seahorse are recognized as vulnerable to habitat degradation and exploitation by the World Conservation Union (IUCN). Although they are found in seagrass beds, lagoons and estuarine habitats throughout the Mediterranean Sea and northeastern Atlantic Ocean, their conservation status in many of the coastal European countries remains undetermined. This is largely due to a lack of basic biological information needed to make such evaluations. My research centers on quantifying such ecological parameters as growth, survival and fecundity as well as enhancing our understanding of reproductive behaviour and movement patterns. Being able to safely mark and monitor individuals greatly facilitates my ability to carry out my research in situ.

Having previously used VIE tags in *Dicamptodon tenebrosus* (the Pacific Giant Salamander) with great success, I was keen to apply the marking technique to these small fishes whose morphology make them very difficult to tag successfully using more conventional methods (e.g. collar tags, fin-ray clips, coded wire tags, PIT tags). Using 3 small marks, I individually tagged approximately 300 juvenile and adult seahorses ranging in size from 5-18cm in length (top of crown to tip of tail). I released the seahorses back to their capture sites and monitored their markings regularly. The seahorses proved somewhat more difficult to tag than salamanders, having thin body walls and rigid segmentation. However, tag loss appears to have been less than 5 % after 3 months in situ and seahorses rarely exhibited signs of irritation on or close to their markings. Research, and tagging, will be on-going until December 2003.

For more information on “Project Seahorse”

www.seahorse.mcgill.ca



Photo by Jose Antonio Rodriguez 2001 ©

Male *H. hippocampus*, pregnant,
marked with VIE red & yellow along the nape.

New Coded Wire Tag related products and accessories at NMT...



The Wand Shield ...made from durable, non magnetic, stainless steel. The Wand Shield can be added to any of the newer style Handheld “Wand” Detectors (made since August 1995) to protect the wand nose from damage caused by fish’s teeth when sampling is done on the inside of the mouth. The Wand must be sent in to NMT for the shield to be attached. Available August 2002, at \$150.00 each (quantity discounts available) for more information contact techsupport@nmt.us

Wand User’s Information...now available are the Handheld Wand Instructional CD and Field Guide booklet. These items will be supplied with all new Wands and are available to all current Wand owners. Great for training programs, workshops or the individual who uses the NMT Handheld Wand Detector in their Coded Wire Tag program. If you have not already received your free copy please contact office@nmt.us

More information is being added all the time!.. The “Research” section of the NMT website has answers to many questions about the use of NMT technology. “References and Application Notes” are continuously being added; so this section keeps improving. Also, a new web form lets you tell us about your project!



Now it is even easier to get to the NMT web page
www.nmt.us

E-mail: office@nmt.us
Tel (360) 468-3375 Fax (360) 468-3844

Jan Sanburg-Customer Service
Northwest Marine Technology
P. O. Box 427
Shaw Island, WA 98286 USA

