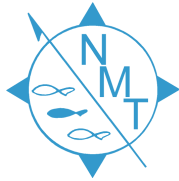


NMT Network News



Northwest Marine Technology, Inc.

Spring 2003

Coded Wire Tags Used to Evaluate Delaware Bay Marsh Restoration

A recent paper by Rutgers University Marine Field Station scientists (Miller and Able 2002) describes how sequential coded wire tags implanted in 8,173 young-of-the-year (YOY, 41-121 mm SL) Atlantic croakers *Micropogonias undulatus*, were used to evaluate a restored marsh creek adjacent to Delaware Bay. The study was the first to compare individual movements and growth rates of YOY for this species, and as far as we know, the first use of CWTs on Atlantic croaker, and to evaluate habitat restoration.

Miller and Able first examined retention and mortality on 150 nape-tagged croakers in the laboratory and determined that 95% remained tagged after 35 days, and that only one died from resulting injuries. The focus then shifted to restored and reference tidal creeks where croakers were seined, tagged using Handheld Multishot Injectors, and returned to their original sites. Following the tagging operation, and over a 105-day period, 3.6% of the tagged fish were recaptured by various means in an intensive sampling program. The sequential tags dissected from the recaptured croakers provided data on growth rates and movements of individual fish.



Above: Croakers were transferred to a land based location for tagging and returned to the site of capture.

Seining for young-of-the-year Atlantic croaker



It was determined that individual growth rates were the same (0.68 mm/day) for both restored and reference creeks, there was little movement between creeks, and that both appeared to be utilized by the species in a similar manner.

Miller, M.J. and K.W. Able 2002. Movements and growth of tagged young-of-the-year Atlantic croaker (*Micropogonias undulatus* L.) in restored and reference marsh creeks in Delaware Bay, USA. *Journal of Experimental Marine Biology and Ecology* 267:15-33.



Right: A young-of-the-year Atlantic croaker

Florida Fish and Wildlife Biologists Successfully Coded Wire Tag Small Red Drum

By John Ransier

Marine stock enhancement has evolved over the past several decades from an intuitive process, which focused on the release of large numbers of fry and fingerlings, to a systematic and science-based endeavor. Advances in related disciplines, such as fish tagging, health, and genetics have all made significant contributions to the advancement of modern stock enhancement. A reliable tag is vital to properly evaluate the effectiveness of an enhancement project. A significant number of the fish released should be identifiable through a tag or mark that allows for an evaluation of various release strategies. However, as fish size decreases, application of a physical tag becomes increasingly difficult.

A new technique was developed to apply coded wire tags (CWTs) to the smallest fish released as part of the Florida Fish and Wildlife Conservation Commission's red drum stock enhancement program. Using custom-made fish positioning jigs, 3,800 small hatchery-produced red drum (25mm – 40mm SL) were successfully marked with CWTs. Two jigs were made to accommodate fish throughout this size range. These jigs were used to insure consistent implantation of CWTs into the nape musculature, just anterior to the dorsal fin. Long-term tag retention ranged from 96.1% to 98.2% at 216 days post-tagging. Growth was not affected by tag presence. Mortality was not significant when the processes of harvesting, size sorting, and tagging were each separated by a minimum of 48 hours. The success of this technique suggests that large-scale tagging of phase-1 hatchery red drum with CWTs may now be possible. Additionally, this technique may have application to other species of small fish.



A FWC Biologist implants a full length CWT into the nape musculature of a 30mm SL hatchery red drum, *Sciaenops ocellatus* using custom made positioning jigs.

The Northern Leopard Frog Reintroduction Project

By Kris Kendall



The northern leopard frog *Rana pipiens* was once a common amphibian found throughout central and southern Alberta. During the late 1970s, the leopard frog experienced a dramatic decline in distribution and numbers over much of its historic range in Alberta. Today, the leopard frog is designated as “threatened” under Alberta’s Wildlife Act and is currently extirpated from the upper Red Deer River and the North Saskatchewan River drainages.

In 1998, the Alberta Fish and Wildlife Division began to explore the feasibility of reintroducing leopard frogs into formerly occupied habitats. With little ability to naturally disperse back into historic parts of its range, a pilot reintroduction project was initiated in 1999 at the Raven Brood Trout Station near Caroline, Alberta. The project involves the captive rearing of leopard frogs from egg stage of development to metamorphosed frog.

continued next page.....

The Northern Leopard Frog Reintroduction Project



Flourescent green VIE tag placed between the frog's toes is used to identify year class

The primary objective of the project is to re-establish leopard frogs in the upper Red Deer River and North Saskatchewan River drainage. Over a 3-year period, more than 4500 leopard frogs have been released into the upper headwaters of the Red Deer River near Caroline. In 2001, 750 young frogs were released at a pilot release site along the North Saskatchewan River near Rocky Mountain House, Alberta. All captive reared leopard frogs were marked with a Visible Implant Elastomer (VIE) tag, providing an externally visible internal identification mark. This tagging system allowed researchers to better assess the survival success at each release site and to monitor the dispersal of released frogs. The tags were placed between the fourth and fifth toe of the rear foot of each frog. Elastomer colour used depended on site of release and year of release.

In 2001, several leopard frogs released in previous years were located in the study area near Caroline, representing the first occurrence of leopard frogs in that area in nearly 50 years. At least three leopard frogs were heard calling from a pond in the spring of 2002 within the same study area and one potential leopard frog egg mass was observed.

For more information about this project please visit the following web site: www.ab-conservation.com or call: Kris Kendell at (780) 422-4764 or e-mail: kris.kendell@gov.ab.ca.

Pushing the Limits with Coded Wire Tags

Many different fishes, ranging from hagfish to largemouth bass have been successfully coded wire tagged. Successful applications have also been documented with various crustaceans including lobsters, crayfish, shrimp, and various species of crabs. One of the most unusual and successful applications of CWTs was with marine polychaetes (worms).

Drs. J.J. Schaffler and J.J. Isely of Clemson University put the CWT to an even more severe and innovative test when they tagged larval beetles (mealworms) *Tenebrio molitor*, commonly sold in pet stores as animal food, with full length (1mm) tags (Schaffler and Isely 2001). In addition to the problem of size (0.18g) of the mealworms, these larvae underwent a series of exoskeleton molts and metamorphosis before reaching adulthood. Although the tagged individuals experienced higher mortality than the untagged controls, and the tag may have interfered with metamorphosis in some cases, 65% of the tagged larvae survived to adulthood, and 93% of these retained CWTs. Since all mortalities occurred during molting, the authors note that this "...was likely the result of not imbedding the tag completely through the exoskeleton". (NMT suggests that the half length [0.5 mm] tags may have improved the overall results.) Schaffler and Isely concluded that "...coded wire tags can be used to mark certain insect larvae without adverse effects on maturation, and that the tags are retained through the adult phase in high enough proportion for practical application."

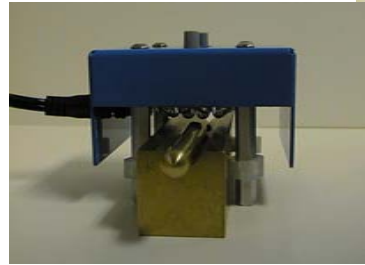
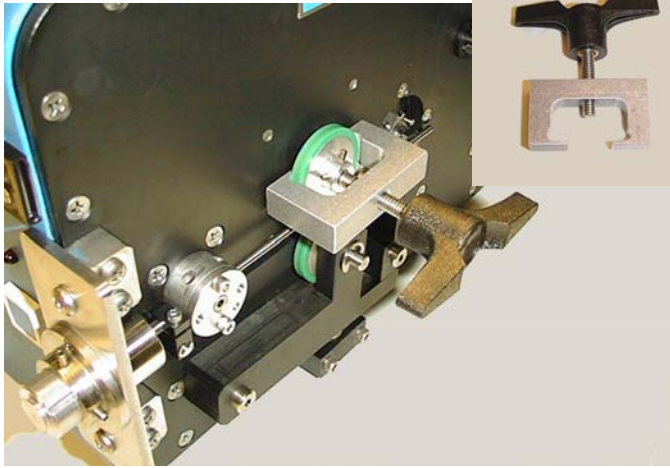
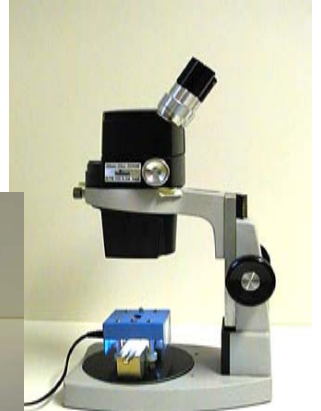


A full length CWT alongside a mealworm. Tags were implanted parallel to the long axis of the abdomen beneath the dorsal surface of the second abdominal segment.

Schaffler, J.J., and J.J. Isely. 2001 retention of coded wire tags, and their effect on maturation and survival, of yellow mealworms (*Coleoptera: Tenebrionidae*). *Florida Entomologist* 84(3): 454-456

New! From NMT

The **Illuminator** is a newly developed light source specifically designed to aid in the reading of NMT Decimal Coded Wire Tags (DCWT). The Illuminator fits over the NMT brass Reading Jig and fits under most microscopes. The Illuminator comes with its own power supply. The Light Emitting Diodes (LEDs) are expected to have a long lifetime and the Illuminator carries a 1 year warranty.



The **Drive Roller Puller** is a safe, elegant method for removing drive rollers that are stuck to the shaft due to corrosion or if the set screws have been stripped by over tightening. Serious damage to the MKIV can result when drive rollers are removed using screw drivers or other devices. The new Drive Roller Puller can be safely used by anyone!

**Find out more about our products on the website
www.nmt.us**

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

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

