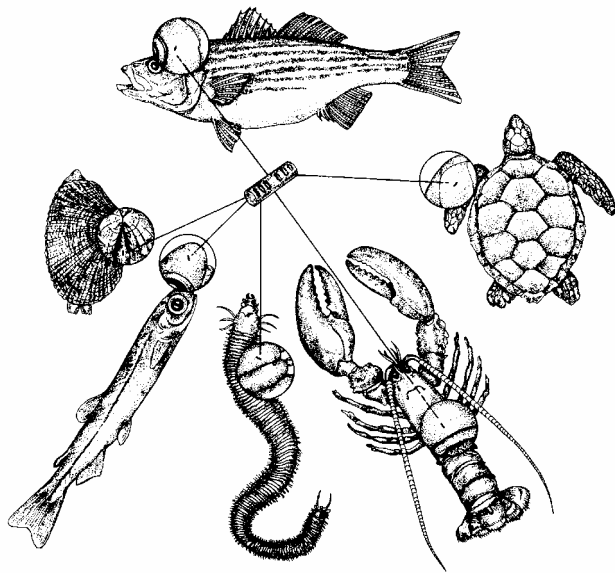


## Individual identification of small numbers of organisms using sequential coded wire tags – an inexpensive option.

Application Note APC05



A frequent enquiry to NMT concerns options for individual marking of small numbers of small organisms. Most individually-numbered tags are fairly large and are not suitable for very small animals; the NMT VI alpha tag for example is not recommended for use on salmonids much below 15 cm in length.

The coded wire tag (cwt) however is designed for use on very small fish – full-length tags have been used on reef fish as small as 30 mm in length. Although the cwt was designed for large-scale programmes involving marking many thousands of individuals, under certain circumstances it can usefully be deployed in small-scale experiments in the laboratory or in the field. The automatic injectors, which cut, magnetise and inject the tag, are relatively costly capital items, as are the detectors. However, tags can be supplied ready-cut for injection using an inexpensive syringe “single-

shot” injector, and detectors may not always be required for tag recovery. There is also the option of rental of the capital equipment.

The Sequential Decimal Coded Wire Tag™ is a 1.1 mm length of stainless steel wire, 0.25 mm in diameter, with both a batch code (to uniquely identify the spool from which the tag was cut) and an individual number (see brochures entitled “The coded wire tagging system” and “An introduction to sequential decimal coded wire tags”, or consult our web site at [www.nmt-inc.com](http://www.nmt-inc.com)). Because of the method of coding it is necessary to retain one tag between each one injected into an animal, for reference, if individual identification is to be guaranteed. Thus only one tag in two is deployed in an animal. If identification of small batches of several animals is acceptable then more of the tags can be deployed, with reference tags being retained between batches. Pre-cut tags can be supplied mounted in columns on waterproof paper, with the reference tags and those to be injected clearly identified. The tags to be used are loaded, one at a time, into the syringe for injection into the animal. This process takes a little time and patience but is viable for experiments involving only hundreds of animals. Peterson and Kay (1992) reported being able to tag juvenile Walleye (*Stizostedion vitreum*) at a rate of up to one fish per 5-10 seconds using a single-shot injector.

The tag must be recovered for decoding under a low-power binocular microscope. This may involve killing the animal, but it is feasible in many species to inject the tag into tissue from which it can be excised without seriously harming it. Examples include between fin rays and in adipose fins and in other transparent tissue of

fish (Heinricher Oven and Blankenship 1993), or in the inter-digital webs of amphibians. Alternatively, it may be possible to use the tag location to differentiate between a small number of individuals or batches; the wand detector can resolve tag location within about 2 cm.

Locating the tag for recovery usually involves an NMT detector, generally a Portable Sampling Detector (PSD) or Wand. However, if it is known which animals are tagged (perhaps all of them in a laboratory experiment) it may be possible to locate and recover the tag using a small magnet. Hager (1975) recovered cwt from the heads of juvenile salmon by removing the whole head and digesting it with a proteolytic enzyme in a magnetic stirring device; the liberated tags adhered to the stirring rod. Elrod and Schneider (1986) used a similar technique involving potassium hydroxide solution.

In some situations it is useful to know which individuals are tagged, without having to use a secondary mark. A detector then becomes necessary unless the tag is visible e.g. between fin rays.

A tag reading jig which is supplied with two magnetic “pencils”, greatly facilitates handling and reading of recovered tags. Alternatively the NMT “magniviewer” incorporates a small microscope, illumination and a tag reading pencil in a convenient format. One of these packages should be considered essential for reading tags in anything beyond the smallest feasibility trials. For very small numbers a single tag-holding “pencil” could be used under a low-power microscope.

Costs would depend on the number of tags required. A typical complete set would be:

1000 pre-cut and magnetized s-cwt mounted on sheets	\$290.00
Single-shot cwt injector	\$105.00
Tag reading jig including two “pencils”	\$315.00
<b>Total</b>	<b>\$710.00</b>

**Note:** 200 is the smallest quantity of cwt that can be purchased, at \$29 per 100, cut and mounted.

A V-Detector is priced at \$6,200, and a wand detector at \$7,300. All prices are in US \$ and are FOB Shaw Island. They are correct at January 2004, but may be subject to change without notice.

Species successfully tagged with coded wire tags include many freshwater and marine fish, and various amphibians, reptiles, crustacea, molluscs and annelids. For further details consult our web page ([www.nmt.us](http://www.nmt.us)) which includes an extensive reference list.

**References:**

Elrod and Schneider (1988). Evaluation of coded wire tags for marking lake trout. *North American Journal of Fisheries Management* 6:264-271.

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