10.1071_ISSN0311-4546EC107p35a

Evaluating fish taggers

IN cooperative fish tagging programs, government agencies supply tags and equipment to anglers to voluntarily tag a range of fish species. It 's a cost-effective way to study fish populations, but how valid and useful are the data obtained when the fish are recaptured?

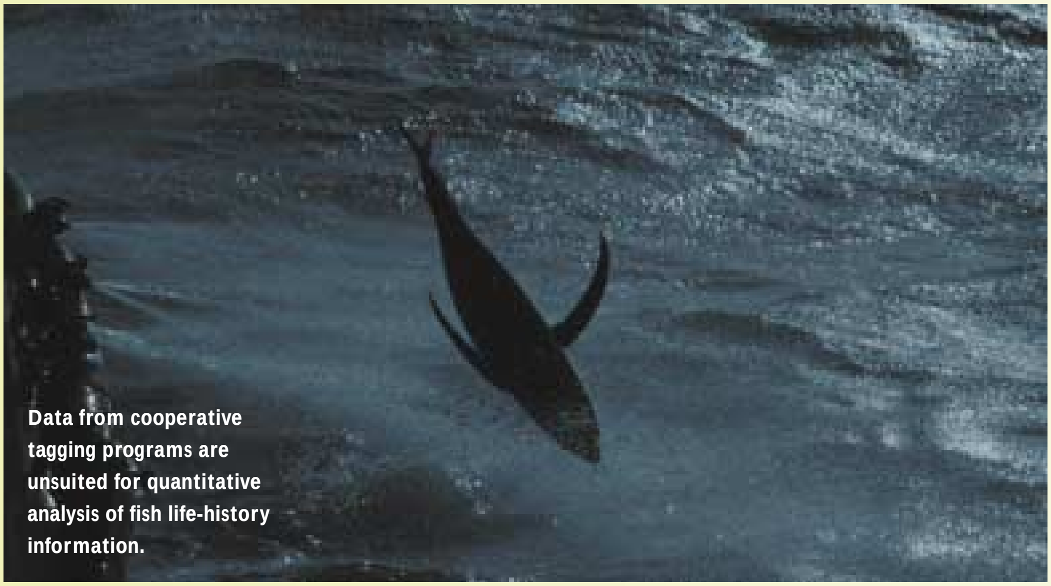
To find out, Dr Bronwyn Gillanders, Douglas Ferrell and Dr Neil Andrew, all then with the NSW Fisheries Research Institute, used tag-recapture data from the cooperative NSW Fisheries Gamefish Tagging Program to assess the usefulness of such information for estimating movement and life-history parameters in yellowtail kingfish. More than 190 angling clubs were involved in the program and anglers received instructions on tagging, but no formal training.

The volunteers tagged 17 190 kingfish, a popular sporting fish, between 1974 and 1995 and 1376 fish were recaptured, most within 50 km of where they had been tagged. One fish moved 3000 km, turning up near New Zealand, and another spent a record 1742 days at liberty before recapture. Movements along the east coast of Australia seemed more frequent than off-shore movements. Small fish moved less than large ones.

Gillanders and her colleagues conclude that it is not possible to use data collected from cooperative tagging programs for quantitative analysis of fish life-history information. There are simply too many shortcomings, including the lack of estimates on fishing effort, level of tag reporting, tag-related fish mortality and tag loss. On the other hand, the program provided useful biological data on fish movements, growth rate, and the like, so anglers' conscientious contributions to research have not been for nought.

Gillanders BM, Ferrell DJ and Andrew NL (2001) Estimates of movement and life-history parameters of yellowtail kingfish (*Seriola lalandi*): how useful are data from a cooperative tagging programme? *Marine and Freshwater Research*, 52:179–92.

Steve Davidson



Data from cooperative tagging programs are unsuited for quantitative analysis of fish life-history information.

10.1071_ISSN0311-4546EC107p35b

Hosting the quandong

THE quandong is an unusual plant in more than one respect. Apart from being one of the few native trees that is now grown commercially for its edible fruit, it has the rare distinction of being a semi-parasitic tree that grows best when its root system has tapped into the roots of a host plant. So growers always plant host plants and quandong seedlings together in their orchards, and they need to know as much as possible about the host-parasite relationships.

This was the challenge facing Dr Beth Loveys and Associate Professor Steve Tyerman, then both with Flinders University in South Australia, and Dr Brian Loveys, of CSIRO Plant Industry. They ran a series of experiments investigating the transfer of compounds from two host species, white cedar (*Melia azaderach*) and creeping boobialla (*Myoporum parviflorum*), to quandongs.

By using radioactive carbon, the researchers found that glucose moves from the myoporum host plant to the quandong trees, no doubt benefitting the quandongs, even though these can photosynthesise in their own right. It is also likely that the quandong obtains some water from its host plant.

Quandong growers in New South Wales also say that fruit grown near white cedars, also a native species, sustain less insect damage, particularly from quandong moth. This observation lead Loveys and her colleagues to investigate the matter. Mass spectrometry analysis showed that quandong fruit from trees growing near white cedar trees contain an unidentified insecticidal compound. This was also found in the host species. So it seems that quandongs can obtain a chemical from particular hosts that may help to ward off damaging insects. A bioassay using moth larvae reinforced this.

There is evidence to suggest that toxins in white cedar may also be highly toxic to mammals, including humans. Loveys says further research is needed before the toxic compounds could be recommended as host-acquired organic insecticides in quandongs.

Loveys BR Tyerman SD and Loveys BR (2001) Transfer of photosynthate and naturally occurring insecticidal compounds from host plants to the root hemiparasite Santalum acuminatum (Santalaceae). *Australian Journal of Botany*, 49:9-16.

Steve Davidson

10.1071_ISSN0311-4546EC107p35c

Budding myth

EUCALYPTS are famous for their ability to sprout new shoots along their branches and stems after fire, insect attack, drought, lopping or wind damage. Anyone who has heard of these epicormic shoots knows that they sprout from small dormant buds buried in the outer bark of the tree. 'Wrong!' says Dr Geoff Burrows of Charles Sturt University. It now seems that this long-standing belief, even among botanists and foresters, is a myth.

After studying the anatomy of epicormic bud strands in the sugar gum (*Eucalyptus cladocalyx*), and in other related species, Burrows says that typically no buds are present in the stems or larger branches of eucalypts. Rather, these trees have radially orientated strands of tissue, which extend from the pith, or inner core of the stem, to the outer bark. Close inspection of a smooth-barked species of eucalypt, such as a sugar gum or ribbon gum, will reveal little mounds on the surface of its branches, indicating the location of the tips of these strands. In the inner bark, near the wood, each strand possesses several very narrow strips of cells that can produce hundreds of buds, but only when given the appropriate hormonal signal, say after fire.

In many northern hemisphere trees, such as oak, maple and willows, epicormic shoots grow from small, but fully formed, buds embedded in the outer bark. However, in our eucalypts the epicormic buds tend to form, only when required, from tissues close to the wood, where they gain maximum protection thanks to the full thickness of the bark. This is one reason why eucalypts are very fire resistant. In contrast, the dormant buds of many exotic trees could easily be damaged by fire.

Burrows GE (2000) An anatomical study of epicormic bud strand structure in *Eucalyptus cladocalyx* (Myrtaceae). *Australian Journal of Botany*, 48:233-245.

Steve Davidson