

ANGLERS CONTRIBUTE TO 30 YEARS OF TAG AND RELEASE SCIENCE

By Stuart Dunlop and Rudy van der Elst

In response to public concern over declining elf/shad stocks during the 1970s, the Oceanographic Research Institute (ORI) conducted an investigation on shad populations along the coast. Regulations were later imposed on their capture during the late 1970s. As some of the older generation may remember, these included a size limit of 310 cm total length, a bag limit of 4 fish per person per day and a closed season from the 01 September to 31 December. Surprisingly, this sparked outrage amongst the general angling public and in 1979, the Smith Commission of Inquiry launched an investigation into the regulations advised by ORI. This proved to be a watershed moment in South African linefish management. Not only did the Commission endorse ORI's research that called for control over shad angling in KwaZulu-Natal (KZN), but it also posed the question as to whether stocks in the Cape were part of the same population, and hence would also require protection. As Cape fishermen were vehemently opposed to any controls at the time, it posed a real challenge. How to investigate this problem?

Clearly tagging presented a unique opportunity to identify connectivity between fish in KZN and those occurring in the Cape. Consequently, Rudy van der Elst and Simon Chater from ORI assembled a small team of fishermen to undertake the difficult task of tagging as many shad as possible in the shortest time. A month-long tagging expedition was launched in 1981 during which several hundred shad were tagged at Struisbaai, Plettenberg Bay, East London and later at Durban and Cape Vidal (Figure 1). The results were very convincing with several fish, having been tagged in the Cape, being soon recaptured on the KZN South Coast.

Fortunately at this time there was a growing conservation sentiment among certain angling fraternities, stretching from Zululand to the Eastern Cape and beyond to Gordon's Bay. ORI took advantage of this situation by introducing a number of joint initiatives such as catch return cards and the analysis of specimens caught during angling tournaments. ORI next raised the idea of fishermen tagging fish on behalf of scientists, thereby assisting research and having a bigger stake in the future of their own sport and its sustainability. The idea was immediately popular, especially amongst the big game fishermen of the Western Cape and billfish anglers from the Sodwana Billfish Club, and in 1984 the Oceanographic Research Institute's Cooperative Fish Tagging Project (ORI-CFTP) was launched.

Over the years there have been many different types of tags developed for marking fish including coded wire tags, passive integrated transponders (PIT tags) (similar to those used to 'chip' dogs and cats locally), satellite tags, acoustic tags and archival tags. However, traditional mark-recapture using visible external tags is one of the oldest and most commonly used methods. Initial tag types used by the ORI-CFTP were based on this concept and included modified livestock ear-tags (**Figure 2**) and large streamer tags imported from Floy Tag & Mfg. Inc. in the USA. Fortunately, through a number of international and local studies conducted on various tag types to determine their affordability, practicality for application by anglers, and effectiveness (i.e. minimal impact on fish and low shedding rate), a suite of suitable tag types were eventually selected for the Tagging Project and most of these remain in use some 30 years later. Today all our tags are imported from Hallprint © in Australia who are considered to be one of the best manufacturers of fish tags. Essentially, each tag

consists of a monofilament vinyl streamer attached to a plastic barb, much like a miniature version of a spear from a speargun (Figure 3). Each tag is inscribed with a unique alpha-numeric code (e.g. D123456) and contact details (i.e. email address, cell phone number and postal address). Tags are generally inserted with a sharp, hollow, stainless steel applicator, into the dorsal muscle tissue of a fish or shark (see Figure 5), although this may differ in certain fish species. Upon initial tagging (and subsequent recapture of a tagged fish) anglers record the following information: fish species, length (fork or total), tag number, exact locality and date of capture. The use of external tags by the ORI-CFTP is particularly favourable as it is relatively cheap (\pm R10 ea.) compared to other tagging methods such as satellite tags (>R20 000 ea.) and acoustic tags (>R3000 ea.), relatively little training is required to insert tags, no software is required to download information from each tag, and the tagging equipment is very basic. This allows a relatively large number of fish to be tagged at little cost and allows citizens who are not trained scientists to be involved, similar in some respects to the South African Bird Ringing Unit.

Currently some 5 500 members have joined the ORI-CFTP since 1984 and they have accounted for the capture, tagging and release of an incredible 285 177 fish, mostly in South African coastal waters, but also occasionally in Mozambique and Namibia. This value represents 285 000 fish that were released to 'fight another day' and hopefully reproduce for future generations! Our top five fish tagged include: galjoen (59 218), dusky kob/kabeljou (16 799), leervis/garrick (13 424), dusky sharks (12 499), spotted grunter (10 963) and copper/bronze-whaler sharks (9 153). The most exciting part of the Tagging Project is the recaptures and to date a total of 16 018 (5.6%) recaptured fish have been reported to ORI. Unfortunately, a large proportion of recaptured fish are not reported to ORI, which would, with greater awareness, undoubtedly increase the recapture rate substantially. If you see or hear of any angler who has caught a tagged fish, please offer to assist them in recording the relevant information (tag number, species, correct length measurement, exact locality, date, angler name and contact details, and whether the fish was kept or re-released) and even offer to send the information in to us on their behalf (oritag@ori.org.za / 031 328 8159 / 079 529 0711).

Over the past 30 years there have been some amazing recaptures reported to ORI. The fish species with the highest recapture rate is speckled snapper with 1 893 fish tagged of which a remarkable 804 (43%) have been recaptured, owing largely to its highly resident behaviour. The longest recorded time free (the length of time a fish was at liberty between the initial tagging and first time recaptured) for a bony fish was for a red steenbras tagged in the Tsitsikamma National Park in 1989 (Figure 4). This fish was eventually recaptured off Kei Mouth in the Eastern Cape in 2011, some 22.1 years later, providing strong evidence of the longevity of this species. Similarly, a ragged-tooth shark tagged at Southbroom on the KZN south coast in 1988 was recaptured in Mossel Bay in 2011, a staggering 22.6 years later and 1014 km away from its original tagging location. A yellowfin tuna tagged off Cape Point was recaptured just under two years later, off the Seychelles, having travelled an incredible distance of \pm 5 100 km. This means that the fish swam a minimum of 7.3 km per day, assuming it travelled in a straight line! Of greater significance is the fact that this yellowfin tuna has shown us there is some connectivity between tuna populations that occur in the Atlantic Ocean off South Africa and those found in the Indian Ocean around the Seychelles. This finding is invaluable, particularly for the future management of these fish populations that were once thought to be isolated fish stocks. The most recaptured individual fish on the project is a yellowbelly rockcod tagged in the Pondoland Marine Protected Area just south of Port Edward, which has been

recaptured no less than nine times on the same reef over a four-year period (Figure 5)! It is these incredible recaptures and the numerous others on the tagging database that make this project so exciting and beneficial.

Despite the voluntary nature of this project, the tagging of fish still has great scientific merit, allowing us to learn more about the movement patterns, growth rates, mortality rates and population dynamics of our important linefish species. This information is extremely valuable and is used by scientists and managers around the country to help conserve fish populations. Aside from the large quantity of important scientific data collected by this long-term project, the tagging project has also made a major contribution towards changing the ethics of anglers with regard to catch-and-release. Not only do anglers now have a reason to release captured fish, they are actually contributing to a better understanding of the biology and ultimately the conservation of that species. For those of you reading this article who are interested in joining the ORI-CFTP or if you would like to report a tag recapture, please contact the Tagging Officer at ORI (oritag@ori.org.za / 031 328 8159 / 079 529 0711) for further information.



Figure 1: Simon Chater from ORI tagging and releasing a shad/elf in 1981 off Durban.



Figure 2: Modified livestock ear-tags used to tag fish in the early days of the ORI-Cooperative Fish Tagging Project.

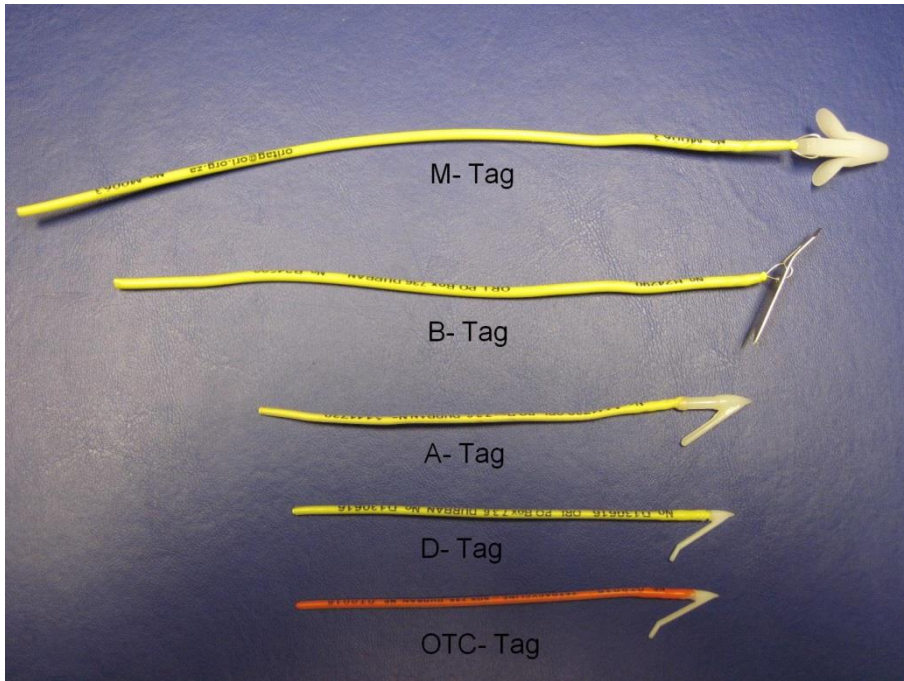


Figure 3: Tags currently used on the ORI-Cooperative Fish Tagging Project.



Figure 4: A red steenbras tagged by scientist Bruce Mann in Tsitsikamma National Park in 1989 (left) and recaptured 22.1 years later (right) some 600km away from its original tag site.



Figure 5: A tagged (visible by the yellow marker just below the dorsal fin) yellowbelly rockcod that has been recaptured nine times over four-years on the same reef in the Pondoland Marine Protected Area.