Exploring movement patterns of mulloway through recreational tagging

In Victoria, results from a currently funded RFL grant (Ref 15/15278) show that Mulloway rely on estuarine habitat in their early years of life. The citizen science project has involved over 60 anglers who have collectively donated around 390 frames. This research continues to provide valuable information on the species biology. In particular, preliminary reproductive data, obtained largely by recreational fishers who predominately target estuaries, suggests a considerable proportion of mulloway from these estuaries are juveniles (i.e. first 3–6 years of life). Thus, our current understanding is largely restricted to juveniles or young adults (i.e. first 3–6 years of life) and significant knowledge gaps exist for larger adults, which are likely to be contributing substantial reproductive input into the population. Larger mature mulloway are only occasionally caught from estuaries, leading anglers to ask the question "where do mulloway go once they leave our estuaries?" Since very few anglers target and catch mulloway in Victorian coastal waters, the abundance of older adults in Victoria remains largely unknown and therefore needs to be further explored to gain a more accurate account of the population status.

In South East SA, mulloway are known to spawn at the mouth of the Murray River. Although it is possible that spawning does occur at some locations in Victorian waters, e.g. Western Port Bay, it is still likely that Victorian mulloway migrate back to South Australia to breed. Unlike Victoria, large adults are heavily exploited in South Australian waters along the Coorong and also coastal New South Wales. If there are no other major spawning areas in parts of Victorian it could mean that the sustainability of the Victorian mulloway fishery largely depends on the careful management of adult spawning stocks in interstate waters. Understanding broad-scale movement patterns are clearly critical for effective management of sustainable populations that support a robust recreational fishery. Finally, any insight into the connectivity between estuaries and marine coastal waters would enhance our current limited understanding on the relative importance of these environments at different life stages.

We propose to use a state-wide recreational external tagging program to investigate broad-scale movement patterns of mulloway across Victoria and potentially interstate. The project will aim to:

1. Investigate inter-estuarine (between) and marine movement patterns to assess connectivity.
2. In conjunction with biological data collection (from current RFL grant), investigate connectivity between estuaries and marine waters to further understand timing and location of spawning.
3. Assess length related recapture data to explore differences in estuarine and marine usage, migration potential and species behaviour at different life stages.
4. Investigate intra-estuarine (within) movement patterns to explore finer-scale spatial movement patterns.

The recreational tagging program will be a state-wide project, coordinated in partnership with ANSA Victoria and Fisheries Victoria. We will work with our well-established network of anglers, along with additional angling clubs (including those previously involved in VicTag) to select prominent mulloway anglers across the state. Following training, anglers will be issued with a tagging kit with the aim of tagging 2000 mulloway over two years. The details of tagged fish will be recorded on a tag card with the corresponding tag number and returned to Nature Glenelg Trust. When a tagged fish is

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recaptured, catch information will be linked to the original tag and release and compared to the recapture information.

The continued research into mulloway biology and ecology is timely, since Fisheries Victoria recently declared the status of mulloway stocks in western Victoria as uncertain. Understanding the movements and structure of mulloway stocks is essential to improving the understanding and management of this valuable but elusive species. Confirming links between estuarine nursery areas and spawning grounds in marine waters will also help address critical knowledge gaps that exist for the adult life stages. Unlocking some of the mysteries surrounding mulloway behaviour will provide valuable insight for both scientists and anglers. Through improved species knowledge, more anglers may feel better equipped to target the species in their local waterway.

Finally, promoting catch and release fishing through the recreational tagging program is an excellent way of minimising exploitation on mulloway populations in Victorian estuaries, where we know a large proportion are juveniles. Catch and release fishing is becoming increasingly popular, particularly with anglers targeting mulloway on lures. This alone makes them an ideal candidate for a catch and release tagging program, since lures reduce deep hooking and maximise survival rates. Many anglers would prefer an opportunity to tag and release mulloway and learn more about the species ecology and behaviour, which shows a growing conservation commitment which should be celebrated. This project will allow fishers to actively contribute to increased knowledge of mulloway and better species management.

Recreational anglers will be directly involved throughout the project and kept informed of the progress and findings as they come to light. A certificate, detailing the distance the fish travelled and its growth will be sent to the anglers who first tagged the fish and the anglers who recaptured it. Anglers will also be kept informed of mulloway recaptures on a Facebook Page and website. Finally, tag-recapture data will be incorporated into the current mulloway newsletter that is distributed to all anglers involved in the citizen science RFL grant.