

Progress Report SP 2020-029

Apply acoustic technologies to investigate fish communities and movement

BCS Rivers and Estuaries Science

Project Core Team

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Project Team granted
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Context

How fish utilise the Swan Canning Estuary, including distances moved on a daily or seasonal basis and movements in response to changes in environmental condition, remains a key knowledge gap despite a number of detailed studies on fish biology and ecology over the past three decades. This information is particularly important in relation to recreationally targeted fish species that have high value in the Perth community.

Acoustic technology can be utilised to provide valuable information on fish movements relative to water quality parameters, such as salinity and dissolved oxygen, and to major interventions within the river system, such as the Swan Canning Oxygenation Program and the Kent Street Weir fishway. Acoustic technology can also be employed to understand how fish utilise habitats of differing complexity, particularly those that are not suited to traditional sampling methods.

Aims

- Utilise acoustic technology to assess fish communities and movement relative to water quality, habitat complexity and in-river interventions.

Progress

- Acoustic receivers were retrieved from an acoustic receiver array that was established in the Swan Canning estuary in 2016. Data on the movement of 120 tagged black bream were downloaded and movements are being analysed relative to historic physico-chemical data derived using the Swan Canning Estuarine Response model.
- Acoustic receivers were redeployed and re-distributed for the purpose of tracking juvenile bullsharks.
- Non-selective gillnetting and targeted rod and line fishing commenced, with two juvenile bull sharks tagged to date. The dorsal fin of each shark was fitted with a InnovaseaV9 acoustic tag attached to a rototag. These are expected to transmit a signal every 90 seconds for approximately two years, with the location of the shark recorded by the array when it is within range.
- Project summaries for side scan, acoustic sonar and split-beam transducer work were completed.

Management implications

- The application of acoustic receiver technology combined with water quality estimates derived from model outputs will help improve understandings of how fish populations respond to changes conditions.
- The movement of bull sharks, within the Swan Canning Riverpark remains a key gap in our understanding of the ecosystem. The provision of better data about the movement of this species will improve our understanding of the residency time, distribution, habitats used and responses to changes in environmental conditions within the system.

Future directions

- Continue the analyses of bream movement relative to water quality.
- Undertake further tagging activity of bullsharks during the pupping season.
- Supplement the existing array with additional receivers through the lower Swan Canning basin.