Report 2009: Loan of AATAMS VR2W receivers

Movement patterns, habitat use and species interactions of key shark and finfish species in coastal systems

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Summary:

Acoustic methods are being used to measure movement patterns of a range of shark and finfish (Teleost) species in coastal habitats of south east Tasmania. This project is a collaboration between two studies within the same region, effectively permiting a multispecies approach by merging resources to increase possible output. The sharing of field and equipment expenses increases data collection capabilities by allowing a much larger VR2 array system to be established than would be possible for individual studies. Moreover, the combination of the two projects permits data to be collected for multiple species, producing information on both individual species and species interactions, effectively studying a component of the coastal ecosystem.

The first study, examining the movement of sevengill sharks (*Notorynchus cepedianus*) and their prey is a significant component of a larger project on the role of apex predators in coastal ecosystems and their interaction with fisheries. The movement component of this study will be accomplished by utilising a range of tracking and monitoring techniques to examine spatial and temporal population dynamics such as movement patterns, seasonality, and site fidelity. The combination of trophic and movement data will indicate habitat usage, predator prey interactions and food web dynamics. Significant prey items such as gummy (*Mustelus antarcticus)* and school sharks (*Galeorhinus galeus*) will also be tagged to allow the comparison of movement patterns of predator and prey and examine any interactions.

The second project is examining the movement of important inshore recreational species, including sand flathead (*Platycephalus bassensis*), black bream (*Acanthopagrus butcheri*) and, in conjunction with the Inland Fisheries Service (IFS), sea-run brown trout (*Salmo trutta*). These species are, by numbers, amongst the most commonly caught fish by recreational anglers in Tasmania. An understanding of their movement and behaviours in response to environmental factors and seasonality will provide useful information for the ongoing sustainable development of the recreational fishery that target these particular species. In addition information gained from these acoustic telemetry studies will provide interesting and useful information on the ecological role these species play in their given habitats.

Aims:

Objectives – In relation to IMOS (AATAMS)
To study the spatial dynamics and habitat use of seven gill sharks their prey and key recreational fishery species in coastal habitats

Aims-
1. Determine seasonal movement patterns
2. Determine habitat usage, including residence times in different habitat types
3. Determine movement patterns in relation to life history stages
4. Determine the use of coastal habitats (critical habitats)
5. Investigate species interactions and predator prey relationships

Update of animals tagged:

Spring 2008 was the beginning of our second season of shark tagging. Unfortunately a few of the species we wanted to tag proved to be elusive, namely school sharks (*Galeorhinus galeus*) and Elephant Fish (*Callorhinchus milii).* However we still managed to tag a number of species that are important components of Sevengill shark diets. Southern eagle rays were included in the tagging program due to their prominence in the dietary analysis on sevengill sharks. All tagging was conducted in the same sites as last year, i.e. the Derwent Estuary and Norfolk Bay. The list of tagged species follows. An additional 6 sea-run brown trout (*Salmo trutta*) were also tagged in the Derwent.

Tagged species:

Sevengill sharks (*Notorynchus cepedianus)*	11
Gummy sharks (*Mustelus antarcticus*)	6
Elephant Fish (*Callorhinchus milii)*	3
Dogshark (*Squalus acanthias*)	5
Southern eagle rays (*Myliobatus australis)*	5

Receiver downloads and redeployments:

May to July 2009 all receivers were retrieved and downloaded. Twenty one receivers were redeployed to address ongoing questions. The 10 receivers in the upper Derwent region (Der 1 -10) are still being used to study the movement patterns of the recreational fish species (Fig. 1). Curtains B and E which cover the entrances to our main study areas (Derwent & Norfolk Bay) have remained to see if shark species return to these coastal habitats after leaving over winter. Initial results from the sharks tagged in the first season (summer year 1) showed that many of the sevengills did return to the area they were tagged in the second season (summer year 2) of our study. Thus we left these curtains to ascertain the degree of site fidelity, i.e. do sharks return in multiple years, and is this the pattern with both sexes. Additionally, as an extra 30 animals were tagged this summer, the remaining curtains will indicate if these animals return in the following year. Data obtained from the downloads has not been analysed yet. However, a quick inspection indicates that we have a very large data set, which should insure some successful outcomes from both projects.

Continued work

The bulk of the data analysis will be done over the next 6 months. The remaining receivers will be retrieved in the upcoming summer so that the final information on site fidelity can be added to the analysis, with the project being completed early next year.

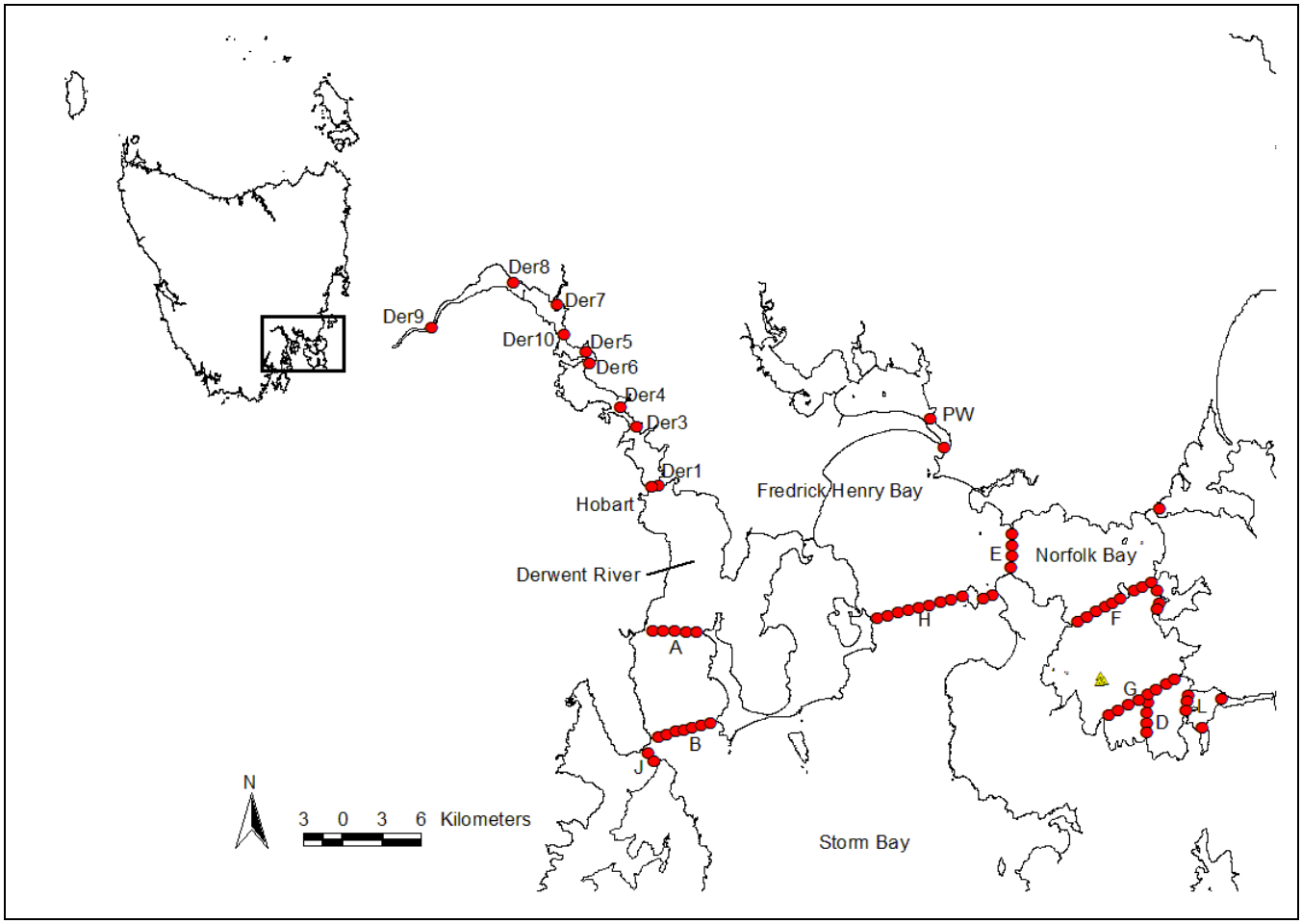

Figure 1. Receiver locations: Note that curtains are labelled by letters and individual receivers up the estuary are individually numbered.