

13. GENERAL DISCUSSION

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13.1 Issues Addressed

This report presents some of the results from three years of research in Torres Strait. Some of the sections cover research which is presently ongoing and therefore are truly provisional in nature, while other sections have been reported in full as those phases of our research are completed. All sections presented in this interim report are essential to meeting our project's objectives (Section 1), as we could not restrict our research to surveys of adult commercial catches and historical studies of the fishery. It was necessary to study aspects of adult reproduction and juvenile development and to initiate tagging studies to understand and elucidate the life-cycle of the commercial prawn species. Tagged prawns also allowed migration and growth rates to be monitored.

It was necessary to investigate the use and performance of various survey gear to quantify estimates of juvenile and adult prawn numbers. Though this work was not an end in itself, it increased our understanding of prawn behaviour and revealed the potential sources of error in our survey estimates.

Velvet prawns are not fished commercially in Torres Strait as they are in other north Queensland fisheries. We included them in our study for a two-year period because they were numerous, they are important to many other fisheries in the Indo-Pacific region, and they are of potential commercial value in Torres Strait. This work is now complete and it greatly increased our understanding of these species.

Our surveys for juvenile prawns in seagrass areas often captured large numbers of other species, most notably smaller fish species. Some of these are known to be major predators of juvenile commercial prawns. By retaining these fish specimens from beam trawl samples we were able to greatly expand our knowledge of potential prawn predators and of the community structure of seagrass habitats.

Gathering information on the basic biological parameters of the commercial prawn species is time consuming. Often there is no completely satisfactory way of assessing the precision of our estimates of important things such as growth rates. A few years study of such a complex system as the Torres Strait Prawn Fishery does not allow much insight into the variability of these parameters between areas, years, and sometimes species. Though there is a strong desire for us to continue to improve our estimates and our understanding of the processes involved, this refinement would ultimately occur at the expense of our commitment to fisheries managers who require information on the relative merits of management options in real time.

Key biological or population parameters can be combined with historical data in new or existing models of the fishery. The creation of these models test our understanding of the system. Our models can be refined as our understanding develops and through this process we can redirect our existing research to gather further information on key parameters or processes, or initiate research on important components that have been overlooked. We can use our models to test the possible impacts of different management scenarios once our models adequately represent our understanding of the system and produce predictions which can be verified. Though the model predictions can often not be tested directly, they nevertheless represent our best estimate of the possible outcome of a management measure given our understanding of the fishery. In this way we can provide fisheries managers with the best information possible on which to base management decisions.

13.2 Present Research

We have addressed many aspects of the Torres Strait Prawn Fishery concentrating on *Penaeus esculentus*, the brown tiger prawn, its most valuable and unarguably its most exploited species. This report does not present much information on the biology of *Metapenaeus endeavouri*, the endeavour prawn, which is nearly as valuable and certainly more numerous, nor does it report on the red-spot king prawn, *P. longistylus*, which consistently forms 10% of the commercial catch. We have three and a half years survey data on the adults and juvenile of both these species being analysed.

This report only briefly reports on the results of our initial *P. esculentus* tagging programme. Further analysis of this data is already underway. We have also completed the field component of a second tagging study of both *P. esculentus* and *M. endeavouri*.

We have modified our sampling programme since our initial three years of surveys which form the basis of this report. Survey stations which were unproductive or which no longer contributed much to our understanding of the fishery or its species composition were abandoned and replaced with others better situated to allow us to test our hypotheses on such concerns as prawn migration routes. New stations have also been added within the jurisdiction area of Papua New Guinea, which will yield critical information on the relationships between the two fisheries and on the best approach for joint management practices.

13.3 Plans for the Future

An additional prawn tagging study is planned for early 1990 which will help distinguish prawn stocks in the far north and in the south of the Australian Torres Strait Protected Zone. This study will also trace the migration of prawns in central Torres Strait beyond the geographical limits previously possible. We plan to tag all three commercial species at these sites.

Further computer modelling is planned. We will collaborate with American researchers to investigate the most modern techniques in fisheries computer simulation. The addition of overseas expertise will ensure that the best of existing approaches are used when our survey data is interpreted for management purposes. Through collaboration we will develop new techniques specifically designed for fisheries such as the Torres Strait Prawn Fishery.

Our second report will address the other two major commercial species, *M. endeavouri* and *P. longistylus*. This second report and subsequent reports will also describe advances made in our understanding of *P. esculentus*. We will document the findings from our two tagging programmes and plan to publish sections of our reports in professional fishing magazines and in the scientific literature.

Responsible fisheries research must provide accurate information on the biology of exploited stocks, and assess the effects of fishing and other factors on these stocks. This can only occur if research programmes are developed through liaison with industry representatives and fisheries managers. This report documents some aspects of our research in Torres Strait and provides a sound scientific basis for the improved management of the Torres Strait Prawn Fishery.