Introduction

This book provides readers with a common language description and analysis of an enormous, revolutionary marine science research project on a truly extraordinary species of tuna – skipjack. The results of this research catalysed South Pacific regional cooperation on the management of what has now become the world's biggest tuna fishery. The research results also greatly increased the understanding in Pacific Island nations of the importance of quality science to the management of the sustainability of the region's tuna resources, including the attainment of consensus on cooperative management of these resources under the new Law of the Sea that was emerging in the 1970s.

The research and events described were hugely important in confirming Pacific Island governments' commitment to regional solidarity. The unprecedented amount of funding for this research, $35.9 million in 2026 equivalence, and the extraordinary funding arrangements put in place to manage these (see Chapter 9) also re-established faith by island nations in the willingness of the former 'colonial powers' to support projects to which Pacific Island nations gave high priority, even if this meant going around long-standing protocols. This faith was being sorely tested in the mid-1970s, a decade in which more than half of the Pacific Island territories gained their independence.

The Skipjack Survey and Assessment Programme was an extraordinary scientific experiment. The concept was initiated by the author in 1974 as the logical international expansion of the tuna research program he had designed and then directed in Papua New Guinea from 1971 to 1975 (see Chapter 1).

The design of the Skipjack Programme gave priority to the use of tag and release methodology to estimate the size and dynamics of the total skipjack resource in more than 30 million square kilometres of the South Pacific

Ocean. The programme worked in the waters of 25 different countries and territories, including Australia and New Zealand. Tag and release had never been used to determine the biomass of a tuna population anywhere in the world, let alone for what the programme was able to determine is the world's biggest tuna resource in the world's biggest ocean. Most fisheries scientists of the time thought that tagging could not be successfully used for this purpose, and certainly not over such a huge area. Most of the few who thought the concept had merit believed that it would be impossible to raise the $4 million estimated in the author's proposal in 1975.

Then began an 18-month pursuit of the necessary financial support. This was catalysed by a 'seed money' grant to the author by the Rockefeller Foundation in New York to support his employment and global travels to prospective donor countries and organisations (see Chapter 5). Potential donors – Australia, France, Japan, New Zealand, the United Kingdom and the United States of America – were quickly identified and pursued (see Chapter 7).

The author's standing in the region, and hence his ability to raise the necessary funding, was greatly increased by the prominent role he played in regional meetings on the growing importance of the emerging Law of the Sea. The two seminal papers he wrote for these meetings were republished by invitation in international law journals. They formed the basis for much of the discussion at these meetings and subsequently the draft convention for the establishment of a South Pacific regional fisheries agency (see Chapter 8).

Extraordinarily, for reasons related in Chapter 9, the donors decided to give the required $4 million to the author personally as the sole executor of the programme that was to be based at the South Pacific Commission (SPC) in New Caledonia. The money was paid into a bank account in Sydney in the author's name.

New Zealand was the first country to formally commit to funding the programme, quickly followed by the other five countries listed previously. The debate behind these decisions is dissected in detail (see Chapter 7).

The fieldwork of the programme ran for three years and included surveys of the skipjack and baitfish resources of all 23 Pacific Island countries and territories in the 30 million square kilometres of the SPC, plus the waters of eastern Australia and Aotearoa New Zealand. The programme tagged and released a total of 140,443 skipjack and 9,596 yellowfin tuna, including a world record for tuna tagging of 3,692 skipjack tagged in a single day

(see chapters 12–18). In total, enough tuna were tagged and released in excellent condition over a sufficiently wide area to result in adequate recoveries of tags with the necessary recapture information to enable the total skipjack population in the survey area to be determined to be 3 million tonnes (the 95 per cent confidence range being 2.5 to 3.7 million tonnes; see Chapter 19). Fears for the sustainability of the skipjack resource have been eliminated by the results of the research described.

The amazing physical and physiological attributes of skipjack were measured by the programme, most for the first time. These included incredibly fast growth (skipjack are big enough, approximately 3 kilograms, to enter the fishery at one year of age), extreme natural mortality (87 per cent of the adult skipjack population dies each year from natural causes), fecundity (in tropical regions, skipjack spawn six times a week, year-round and females lay approximately 300,000 eggs each time) and cannibalism (nothing eats more juvenile skipjack than adult skipjack do, and skipjack juveniles are likely the major predator of skipjack eggs and larvae). The science behind how these attributes impact the sustainability and future resilience of this amazing, evolutionary-extreme species is described in simple language. How a sustainable harvest from the 3 million tonne population can equal, or even exceed, 3 million tonnes per year is explained for the first time in this book (see chapters 19 and 20).

The skipjack fishery in the Pacific is now of huge importance to most Pacific Island countries and territories, in numerous cases representing their primary source of financial independence and export income, in addition to being a major source of sustainable food for island people. The economies of 10 of the island countries have been assessed to be 'tuna dependent': on average, 37 per cent of the taxable revenue in these countries is derived from the licensing of foreign boats to harvest tuna from their waters. Tuna fisheries and associated activities currently employ approximately 25,000 Pacific Island people (see Chapter 21).

At the time of the emergence of the concept of the Skipjack Program in 1975, the annual catch of skipjack from the central and western Pacific was approximately 230,000 tonnes; in 2023 (the most recent year for which an accurate annual measure is available), it exceeded 1.2 million tonnes valued at the first point of sale at $2.2 billion. The 1.2 million tonnes of one species, skipjack, can be put in perspective by comparison with Australia's total annual commercial fish catch, all species combined, of 170,000 tonnes. The 1.2 million tonnes is a lot less than half of the maximum sustainable annual catch of skipjack (anticipated for the first time in this book).

There are now four major international organisations in the central and western Pacific primarily concerned with the research and management of tuna fisheries, predominantly skipjack: the Central and Western Pacific Fisheries Commission, the Pacific Community (formerly the SPC), the Forum Fisheries Agency and the Parties to the Nauru Agreement. All are dependent upon current research and fisheries statistics that flowed, and expanded, from the Skipjack Programme. Skipjack in the South Pacific are not overfished, and overfishing is not occurring. The South Pacific skipjack fishery is acknowledged to be the best-managed tuna fishery in the world (see Chapter 21) because that management is based on science that has been proven to be correct.

The Skipjack Survey and Assessment Programme commenced in 1977. It began a commitment to tuna research at the SPC that continues to the present day. In 2026, tuna research at the SPC has 80 staff and an annual budget of approximately $25 million (see Chapter 21).

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