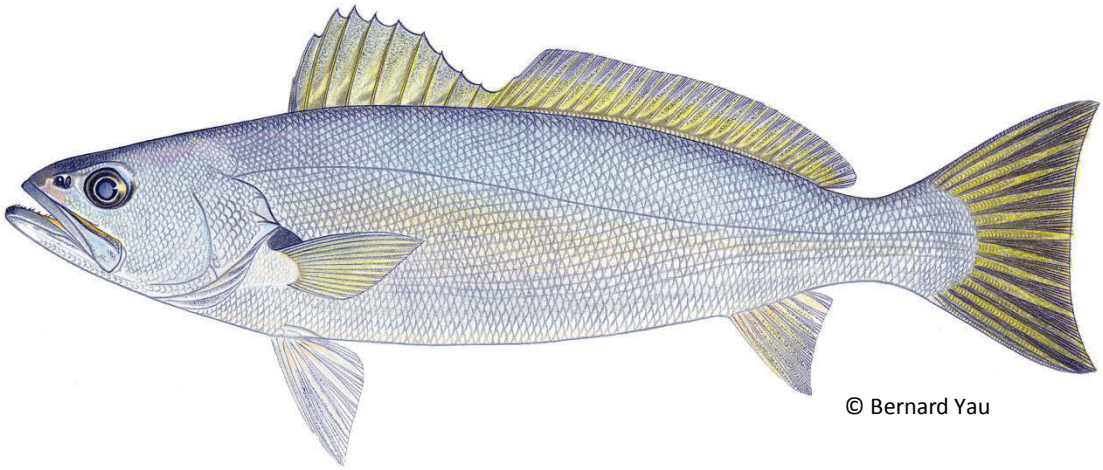
Life History Characteristics and Fishery of Teraglin, *Atractoscion aequidens* in New South Wales, Australia



Anne-Marie Hegarty

B. Marine Sc

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School of Life Sciences

Faculty of Science

University of Technology Sydney

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Preface

The contents contained within this thesis are my own work with guidance from Professor William Gladstone (University Technology Sydney) and Dr John Stewart (Fisheries NSW). The design of the research presented was personally conceptualised with the guidance of my supervisors.

This thesis contains 5 chapters. Chapters 1 (Introduction) and 2 (Fisheries) are descriptive chapters. Two chapters are data chapters (Chapter 3 and 4) prepared as stand-alone journal manuscripts (unpublished). For this reason there will be some repetition in the content. To prevent unnecessary duplication a single reference list will be provided.

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Thesis Abstract

Teraglin (*Atractoscion aequidens*, family Sciaenidae) is a coastal schooling species of fish found in eastern Australian waters and in the South Atlantic Ocean off the coast of Africa. In Australia, they are found from southern Queensland to Montague Island in southern New South Wales (NSW) in depths of 20-80 m over broken gravel and reef. Despite a long history of exploitation this is the first study of the life history characteristics of *A. aequidens* in NSW where they are targeted by both commercial and recreational fisheries. The aim of this study was to describe age compositions, growth rates, and reproductive characteristics in NSW and to compare results to the other *A. aequidens* populations. Fishery-dependant samples were collected from fishermen's co-operatives at major ports of commercial landings between January 2011 and June 2012. Sampling sites were divided into north (30.30° S, 153.12° E) and south regions (32.18° S, 152.51° E) corresponding to two distinct regions of the East Australian Current (EAC). *Atractoscion aequidens* was found to be fast-growing, reaching approximately 40 cm fork length (FL) in the first year of life with a maximum age in excess of 10 yr. Females were estimated to grow to a larger asymptotic length (84 cm FL) than males (69 cm FL). Length/age at which 50% of the population matures is approximately 35 cm FL and 1 yr. In South Africa, the same species matures at 90 cm FL and 5 yr. In NSW, *A. aequidens* displays year-round batch spawning behaviour with asynchronous oocyte development and indeterminate fecundity. Batch fecundity estimates ranged from 32,431 (± 2,370) for a 43 cm fish to 673,813 (± 2,929) for a 71.5 cm fish. Fish from the south region were on average larger than those from the north. The commercial fishery in NSW is predominantly based on young fish < 3 yr. With the majority of the fishery based on young fish and with the species capable of growing to a relatively large size and old age, there is a concern the species is experiencing an excessive fishing mortality rate. There are many examples of declines of sciaenid fisheries due to lack of life history information. This study of the species' life history characteristics and fisheries provides a basis for development of a quantitative assessment which will contribute to effective management of *A. aequidens* for sustainable fisheries.