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New Zealand Fisheries Assessment Research Document 88/39

John dory

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This series documents the scientific basis for stock assessments and fisheries management advice in New Zealand. It addresses the issues of the day in the current legislative context and in the time frames required. The documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

JOHN DORY (Zeus Faber)

Introduction

The biology and fishery for John dory were previously reviewed by Hore (1985, 1986, 1988) and a summary of these papers is presented. Estimates of yield are based on trends in historical catch for the Auckland and Challenger Fisheries Management Areas (FMAs); the sum of catch histories for the Central FMA and on 1983 catch levels for the Southern-Southeast FMAs. An update of recent catches is provided standardised to an October-September fishing year for the period 1983-1986.

John dory (Table 1) are caught primarily as a by-catch of the trawl and Danish seine fisheries. Both catch and catch per unit effort peak during summer months (Hore 1985). The majority of catch is taken in the Auckland FMA with 59% of the New Zealand wide total allowable catch (TAC) allocated in this area.

Little reported information is available on the biology of John dory in New Zealand or throughout the world generally. Janssen (1979) reported a summary of studies of the age and growth of this species in European waters. These studies used length frequency analysis to age fish and took no account of possible differences in growth by sex. Hore (1982) reported the results of a study of the age, growth and reproduction of John dory in the Hauraki Gulf. His study showed that this species are rapidly growing and relatively short lived with a significant difference in growth between males and females. His results also showed that John dory are serial spawners, with spawning occurring between December and March, and that they have a relatively low potential fecundity. Other scattered records on aspects of the biology of John dory include those of Graham (1956) and Tunbridge (1966) who report on the occurrence of ripe females in catches during the months of January and August. There is no other reported information on the growth and productivity of this species in New Zealand.

Review of the fishery

John Dory national reported catches by fishing return area and fishing year are shown in Figure 1 for the period 1983-1986. This information grouped by FMA is shown in Table 2 which also includes foreign charter and foreign licenced catches of John dory for the same period. Foreign licenced catches were recorded for Japanese and Korean vessels only and ranged between 17 and 30 tonnes over the three year period. Foreign charter catches ranged from 30-55 tonnes during the same three years. New Zealand wide reported catches of John dory declined from 826 tonnes in 1983-84 to 735 tonnes in 1985-86. A further decline occurred during the first year of the QMS to 640 tonnes. During this period catches in the Auckland FMA declined from 659 tonnes in 1983-84 to 531 tonnes in 1985-86 and to 413 tonnes in the 1986-87 fishing year. In contrast the reported catches in the Challenger FMA rose from a level of 35-45 tonnes during the period 1983-86 to 58 tonnes in 1986-87. The reported catch of John dory in the 1986-87 fishing year in relation to the current TAC is shown in Table 3. TACs in all FMAs were under-caught.

Recreational and Maori fisheries

There is no information available with which to assess the total amateur use of this species. John dory are a popular catch species with recreational fishermen and are taken by lines and in set nets along the east coast of the north island.

Estimates of Yield

A reassessment of previous yield estimates is presented using the biological reference point of maximum constant yield.

The national reported landings of John dory for the period 1974-1982 are shown in Table 4. These show a steady increase to a period of relatively stable catch from 1980 onwards without the marked fluctuation expected of a short lived species (maximum age 8-12 years) subject to heavy fishing pressure. Maximum constant yields are therefore calculated using the following formula :

$$MCY = c Y$$

in which Y is the average annual New Zealand wide catch for the period 1983-1986 and c is set at 1. Estimates of MCY for John dory are shown in the table below.

FMA	TAC M (t)	MCY (t)
Auckland	510	603
Central	240	133
Challenger	70	39
Southern, South-east	30	1
Kermadec	10	-
Total	860	776

Research

Hore (1982) estimated the recruitment of John dory to the commercial fishery to occur at age 3+ years for females and 2+ years for males. This was based on a study of landed catches at Auckland ports in which the dominant length ranges for males and females were 25-30 cm and 29-33 cm (standard length) respectively. The body shape of John dory makes them susceptible to capture by trawl and Danish seine nets at an early age. Discarding of fish lower than a "commercial" minimum size at sea was common prior to the introduction of the QMS. It is likely that recruitment of John dory occurs gradually over a range of sizes and ages.

Management Implications

The reliability of the current yield estimates for John dory is assessed as being low because of the uncertainties of catch reporting for this species. The current indications of a level of under-reporting of the catch of this species would suggest that TACs in these areas are conservative and therefore sustainable.

There is currently some concern amongst some members of the fishing industry over the difficulty of matching their catch of John dory to their quota holding. This is despite the fact that the TACs in all FMAs were reported as under-caught in the 1986-87 fishing year. The by-catch problem has arisen in a number of ways which include non-reporting of catches and/or the inclusion of small catches of John dory with species of like value for sale and catch reporting.

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TABLE 1. Domestic catch (tonnes) of John dory by fishing method, 1983-85.

Fishing Method	1983-84	1984-85	1985-86
Single trawl	501	432	429
Mid-water trawl	*	*	1
Pair trawl	136	135	115
Pair mid-water trawl	1	-	*
Danish seine	90	110	90
Beach seine	1	1	1
Set net	16	15	14
Lines	9	10	13
Total	753	704	663

TABLE 2. Reported catch (t) of John Dory 1983-1987.

FMA	Reported Catch			
	<u>83-84</u>	<u>84-85</u>	<u>85-86</u>	<u>86-87</u>
Auckland	659	620	531	413
Central	131	110	158	166
Challenger	35	36	45	58
Southern	1	*	1	3
Kermadec	-	-	-	*
Total	826	766	735	640

TABLE 3. Reported catch (tonnes) for the 1986-87 fishing year.

FMA	TAC	Reported Catch	% Uncaught
Auckland	510	413	19.0
Central	240	166	31.0
Challenger	70	58	17.0
Southeast & Southern	30	3	89.0
Kermadec	10	*	97.0
Total	860	640	

Note * indicates less than 0.5 tonne

TABLE 4. National reported landings (t) for John dory, 1974-82.

Year	Reported landings,t
1974	471
1975	374
1976	551
1977	531
1978	528
1979	643
1980	741
1981	820
1982	737

1985 - 86
1984 - 85
1983 - 84

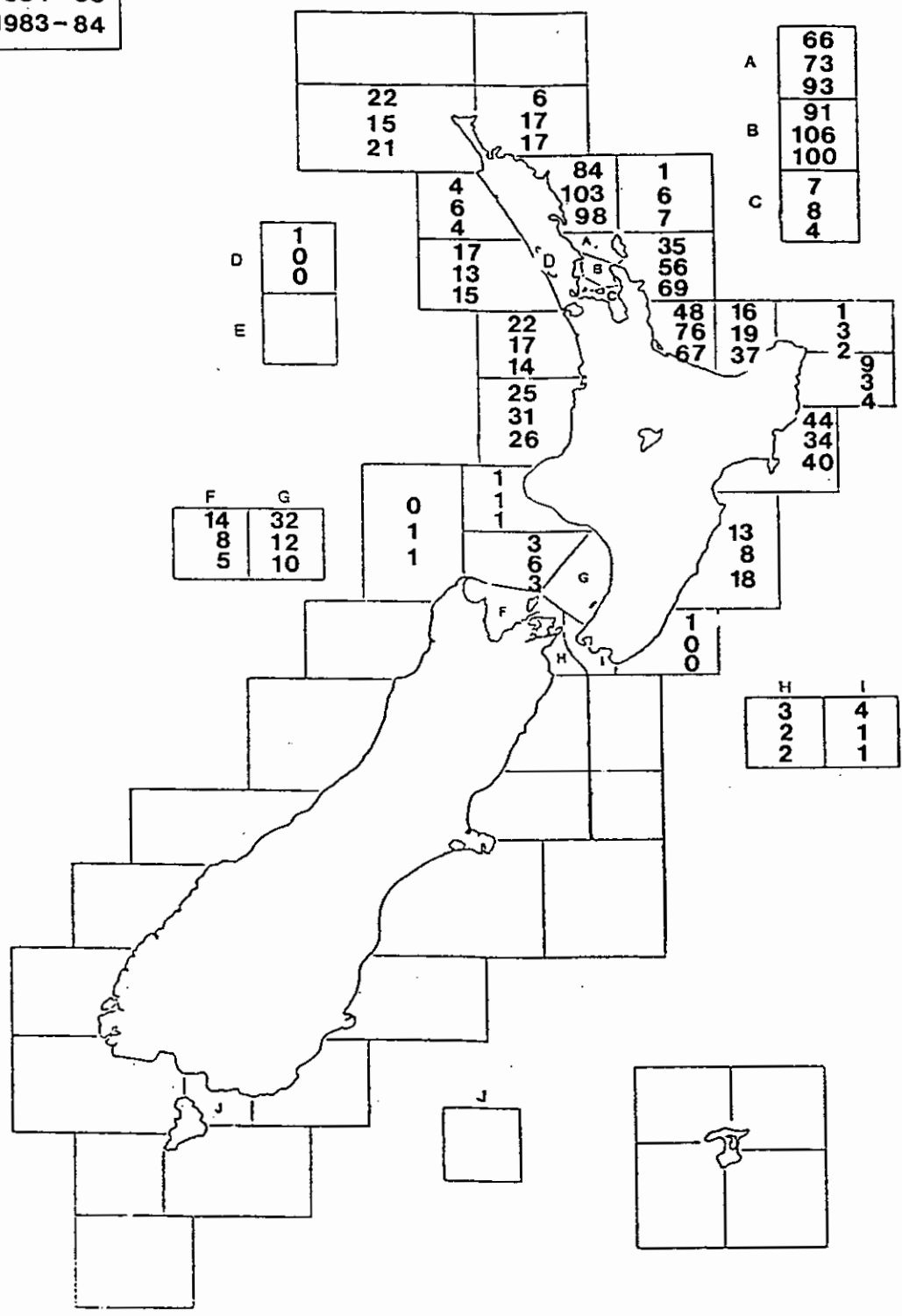


Figure 1 Domestic landing (t) of John Dory by fishing return area (Area not known 1983-84: 85t, 1984-85: 78t, 1985-86: 88t).