CSIRO FISHERIES AND OCEANOGRAPHY
Fisheries Synopsis No. 2

DFO/S2

SYNOPSIS OF BIOLOGICAL DATA ON JACK MACKEREL

Trachurus declivis (Jenyns) 1841

Prepared by
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COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION
Cronulla, Sydney, Australia, October 1967

SYNOPSES OF FISHERIES BIOLOGICAL DATA

This is one of a series of documents issued by FAO and CSIRO concerning species and stocks of aquatic organisms of present or potential economic interest. The primary purpose of the series is to make existing information readily available to fishery scientists according to a standard pattern, and by so doing also to draw attention to gaps in knowledge. It is hoped that synopses in the series will be useful to other scientists initiating investigations of the species concerned or of related ones, as a means of exchange of knowledge among those already working on the species, and as the basis for comparative study of fisheries resources. They will be brought up to date from time to time, as further information becomes available. It is, therefore, recommended that they be filed in loose-leaf folders; pagination begins anew with each chapter, so that partial revisions may be made.

The relevant series of documents are:—

FAO	**Fisheries Synopsis No.** (replacing, as from 1.1.63	FIb/S
FAO	Fisheries Biology Synopsis No.	FB/S)
	and	
CSIRO	**Fisheries Synopsis No.**	DFO/S

Synopses in these series present data compiled according to a standard outline described in FB/S1, (1962). Steps are being taken to form an advisory Association comprising representatives of the participating organizations, authors of synopses and other collaborators.

FAO and CSIRO are working to secure the co-operation of other organizations and of individual scientists in drafting synopses on species about which they have special knowledge, and welcome offers of help in this task. Additions and corrections to synopses already issued will also be most welcome. Comments including suggestions for the expansion of the outline and requests for information should be addressed to the co-ordinator of this work and editor of the FAO series.

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Consolidated lists of species or groups covered by synopses issued to date or in preparation will be issued from time to time. Requests for copies of synopses should be addressed to the issuing organization.

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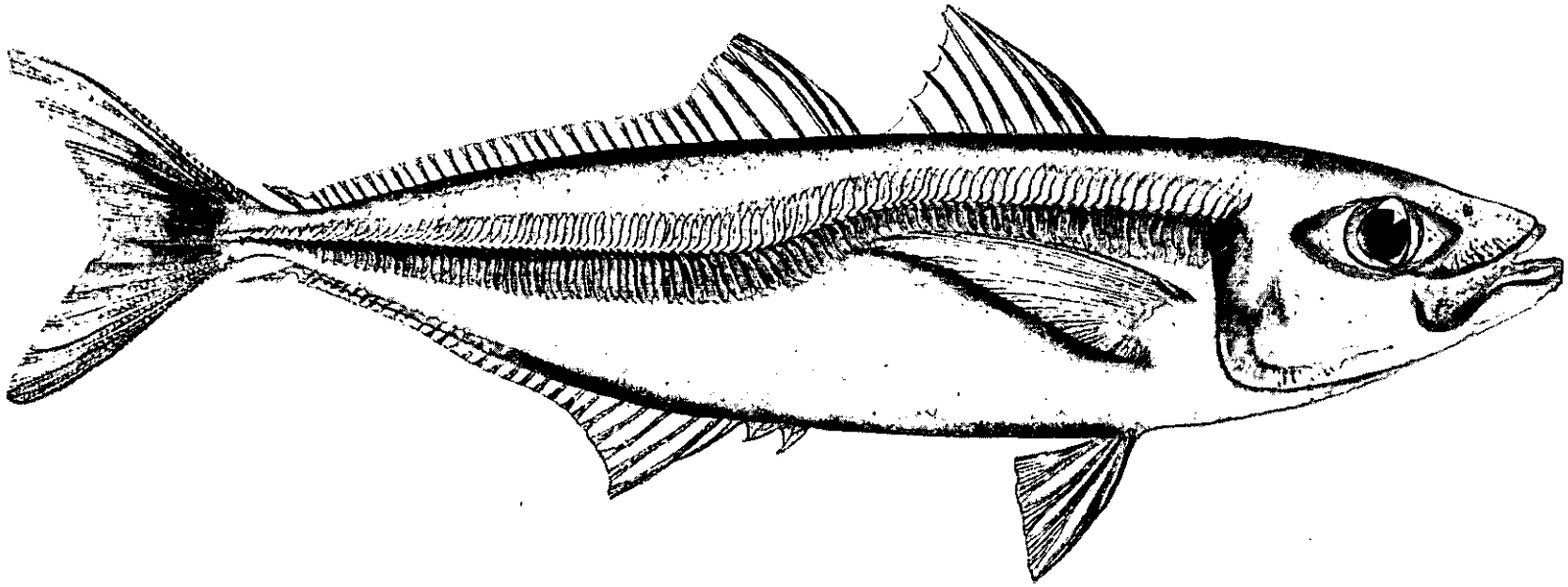
C O N T E N T S



Jack mackerel, Trachurus declivis (Jenyns) 1841

1 IDENTITY

1.1 Nomenclature

1.1.1 Valid name

Trachurus declivis (Jenyns) 1841

1.1.2 Original combination

Caranx declivis Jenyns 1841 (Jenyns 1841, p. 68, pl. xiv)

1.1.3 Objective synonymy

None

1.2 Taxonomy

1.2.1 Affinities

1.2.1.1 Suprageneric

Phylum Vertebrata
Subphylum Craniata
Superclass Gnathostomata
Series Pisces
Class Teleostomi
Subclass Actinopterygii
Order Perciformes
Suborder Percoidei
Superfamily Percoidae
Family Carangidae

1.2.1.2 Generic

Genus *Trachurus* Rafinesque 1810 (Rafinesque-Schmaltz 1810, p. 41)

Genotype: Logotype, *T. saurus* Rafinesque 1810 = *Scomber trachurus* Linnaeus

Generic concept is that of Fowler (1936, p. 686) -

"Body rather long, somewhat compressed, tapers to caudal peduncle, latter wide as deep. Snout rather long. Mouth moderate. Minute teeth, mostly uniserial, in jaws, on vomer, palatines and tongue. Pseudobranchiae present. Air vessel birfurcate posteriorly. Pyloric appendages numerous. Scales small; breast scaled. Lateral line armed throughout with plates, larger and spinous in straight section or along side

of caudal peduncle. Accessory dorsal branch to lateral line. Two dorsals, first preceded by procumbent spine. Two strong spines before anal, connected by membrane. No finlets."

1.2.1.3 Specific

Type specimen : Holotype, Brit. Mus. nat. Hist.

Type locality : King Georges Sound, Western Australia

1.2.1.4 Subjective synonymy

Trachurus novae-zelandiae Richardson (1843, p. 21)

Placed in synonymy by Nichols (1920, p. 478). Reasons discussed.

1.2.1.5 Key (from Nichols 1920, pp. 480-1)

1. Body comparatively deep and compressed, the depth $3\frac{3}{4}$ to $4\frac{1}{5}$ in length to base of caudal 2
   Body elongate, little compressed, the depth $4\frac{1}{3}$ or more in length 7

2. Scutes 70 or 80 (68 to 92) in number 3
   Scutes 94 to 101 in number ..... murphyi

3. Chord of curve of lateral line $1\frac{1}{3}$ to $1\frac{3}{5}$ in straight part 4
   Chord of curve of lateral line 1.2 in straight part; depth 4.1; upper accessory lateral line to front of soft dorsal only; scutes 79 to 92; height 4 or 5 times their length; dorsal with about 28, anal about 26 soft rays ..... mediterraneus

4. Depth about 3.6 or 3.7; scutes about 75 to 77, about 6 or 7 times as high as long in centre of straight part of lateral line; dorsal with 25 to 30, anal 24 to 28 soft rays* 5
   Depth 3.8 to 4.2; upper, accessory, lateral line to front of soft dorsal only (not described in mccullochi); height of scutes 4 or 5 times their length; dorsal with 30 to 34 soft rays, anal with 26 to 31 6

5. Accessory lateral line continuous under soft dorsal ..... semispinosus
   Accessory lateral line to under front of soft dorsal only ..... lathami

6. Bend in lateral line abrupt, scutes 68 to 75 ..... mccullochi
   Bend in lateral line not particularly abrupt, scutes 72 to 80 ... japonicus

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* Capensis probably comes here. Flexure of lateral line less abrupt; scutes 65 to 75.

7. Chord of curve of lateral line $1\frac{1}{3}$ in straight part; upper, accessory, lateral line continuous under soft dorsal; height of central-posterior scutes 6 or 7 times their length; depth about 4.7; scutes about 75; dorsal with about 29, anal about 28 soft rays ..... trachurus
Chord of curve of lateral line scarcely if at all shorter than straight part; upper, accessory, lateral line to front of soft dorsal only (not described for declivis) 8

8. Scutes 81 or 82 (74 to 85); anterior and posterior portions of lateral line horizontal, connected by a short oblique portion; depth about 4.5; dorsal with 30 to 35, anal 28 to 30 soft rays; height central-posterior scutes 6 or 7 times their length ..... declivis
Scutes 96 or 99 (90 to 108); depth 4.5 to 4.7; dorsal with 31 to 33, anal 27 to 29 soft rays 9

9. Anterior scutes $\frac{3}{4}$ as high to as high as posterior, the height of which (centrally) is 5 to 7 times their length 10
Anterior scutes narrow, $\frac{1}{2}$ or less as high as posterior, the height of which (centrally) is 4 or 5 times their length ..... symmetricus

10. Slender. Depth 4.5 or more ..... picturatus
Less slender. Depth less than 4.5 ..... murphyi

1.2.2 Taxonomic status

Morphospecies

1.2.3 Subspecies

None recognized

1.2.4 Standard common names

Jack mackerel - Australia
Horse mackerel - New Zealand

Vernacular names

Cowanyoung - New South Wales
Herring scad - New Zealand

1.3 Morphology

1.3.1 External morphology

1.3.1.1 Description

"Body elongate and fairly robust. Depth 4.75-5.2, head 4-4.4 in length to tail fork. Eye 4-4.25 in

head, 1.2-1.5 in snout; with adipose lid. Maxilla extends slightly beyond front edge of eye. Single series of minute teeth in both jaws, those of lower jaw larger; also present on vomer, palatines and tongue. D. ii-iii procumbent; VIII; i,30-35. A. II, i, 28-30. P. i,24. V. 1,5. L. lat. armed throughout its length with broad keeled scutes, 74-85 arranged (29-35) + (6-8) + (39-42). Scutes 2.9-3.1 in body length and L. lat. bends very gradually behind P. Lower G.R. 30. Dark green-blue above and silvery below."
From Munro (1958, species 807)

1.3.1.2 Geographic variation

No data

1.3.1.3 Morphological definition of subpopulations

No data

1.3.1.4 Description of morphological changes which occur during growth

No data

1.3.2 Cytomorphology

No data

1.3.3 Protein specificity

No data

2 DISTRIBUTION

2.1 Total area

Geographic distribution - found on continental shelf in southern Australian waters from Shark Bay, W.A. to Newcastle, N.S.W. including Tasmania, and in New Zealand.

Western Australia

Jenyns (1841)
Richardson (1843)
Whitley (1948)

South Australia

Waite (1921)

Victoria

Blackburn and Tubb (1950)

New South Wales

Blackburn and Tubb (1950)

Tasmania

Blackburn and Tubb (1950)
Hynd and Robins (1967)

New Zealand

Richardson (1843)
Cuvier and Valenciennes (1833)

2.2 Differential distribution

2.2.1 Spawn, larvae and juveniles

No data

2.2.2 Adults

Blackburn and Tubb (1950) reported large quantities of T. declivis in south-eastern Tasmanian waters from January to June in the years 1938-1944 and Hynd and Robins (1967) reported it during the same period in 1965 in north-eastern Tasmania. T. declivis was also seen in large quantities along the western, southern, and eastern coasts of Tasmania during aerial surveys in 1966 (Hynd, unpublished data).

It is found on the New South Wales coast south of Sydney from August to December, schools being more scattered than in Tasmania (Blackburn and Tubb 1950).

2.3 Determinants of distribution changes

No data

2.4 Hybridization

No data

3 BIONOMICS AND LIFE HISTORY

3.1 Reproduction

No data

3.2 Preadult phase

No data

3.3 Adult phase

3.3.1 Longevity

No data

3.3.2 Hardiness

No data

3.3.3 Competitors

No data

3.3.4 Predators

Southern bluefin tuna (Thunnus thynnus maccoyii) Robins (1963)
Tiger flathead (Neoplatycephalus macrodon) Fairbridge (1951)
Barracouta (Thyrsites atun) Whitley (1946)

Although no published evidence is available, it is likely that most of the larger pelagic fish of southern Australian waters prey on T. declivis.

3.3.5 Parasites, diseases, injuries and abnormalities

No data

3.4 Nutrition and growth

No data

3.5 Behaviour

T. declivis forms surface schools during both day and night (Hynd, unpublished data). When disturbed, all or part of a school breaks the surface giving a very distinctive "frothy" appearance. The school figured by Blackburn and Tubb (1950, Plate 2, Fig. 1) appears to be in this condition.

T. declivis has been recorded from 150-250 fathoms (McCulloch 1915, p. 124).

4 POPULATION

No data

5 EXPLOITATION

None

6 PROTECTION AND MANAGEMENT

None

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