HMAP Dataset 2
SE Australian Trawl Fishery II

Fish (various) landings and fishing effort, South East Australia, 1937-1943

Supporting Documentation

Red Funnel Fishing Trawler *Durraween*

Summary

Dataset Title:	SE Australian Trawl Fishery II
HMAP Case Study:	South East Australian Shelf and Slope
Large Marine Ecosystem:	42: Southeast Australian Shelf
Subject:	Fish (various) landings and fishing effort, South East Australia, 1937-1943
Data Provider:	Neil Klaer Commonwealth Scientific and Industrial Research Organisation (CSIRO) Division of Marine Research GPO Box 1538 Hobart, Tasmania 7001 Australia e-mail: neil.klaer@csiro.au
Data Editor:	Michaela Barnard, MHSC, University of Hull m.g.barnard@hull.ac.uk
Extent:	61,707 records
Keywords:	fisheries statistics; History of Marine Animal Populations; trawling; overfishing; Australian fishing industry

Citation

(a) The dataset: please cite as follows: N. Klaer ed. 'South East Australian Trawl Records, 1937-1943' in M.G Barnard & J.H Nicholls (comp.) *HMAP Data Pages* (www.hull.ac.uk/hmap)

(b) Supporting documentation: please cite as follows: N. Klaer, 'HMAP Dataset 2: SE Australian Trawl Fishery II, Supporting Documentation', in M.G Barnard & J.H Nicholls (comp.) *HMAP Data Pages* (www.hull.ac.uk/hmap)

Acknowledgements:

Funding for the initial data collection and processing was provided by Australia's Fishing Industry Research and Development Corporation (FIRDC). Support was also provided by the Bureau of Resource Sciences (BRS) and CSIRO, while the data processing described in this document was undertaken as part of a project based at the University of Canberra. The data were edited and rendered compatible with the HMAP and OBIS schema by the HMAP Data Pages team at Hull.

Contents

1. Introduction

On 28 November 1991, the New South Wales Department of Agriculture and Fisheries provided historical data relating to the South East Fishery (SEF) to the Bureau of Resource Sciences (BRS) in accordance with the Fishing Industry Research and Development Corporation (FIRDC)-funded 'historic SET catch data' project. The data were originally collected by CSIRO and handed over to NSW Fisheries when CSIRO ceased work in the 1960s on what was then known as the 'South East Trawl Fishery'. These data cover the periods 1918-1923, 1937-1943 and 1952-1957. No documentation exists for these data except for a simple description of the data field names. This document describes the processing carried out, and the assumptions made, to convert the data into a format suitable for inclusion in the Australian Fishing Zone Information System (AFZIS). This format, in turn, was adapted to render the data compatible with the HMAP/OBIS schema.

Data: 1937-1943

(a) *Data Description*

The accompanying field description was as follows:

Table 1: 1937-1943 Data Description

Field	Width	Position	Type	Comments
trip information				
vessel-year	24	1-24	A	*
vessel code	2	25-26	N	
trip number	3	27-29	N	
depart date	6	30-35	N	(yymmdd)
depart time	4	36-39	N	(24 hr clock)
return date	6	40-45	N	(yymmdd)
return time	4	46-49	N	(24 hr clock)
No. of hauls	2	50-51	N	
No. Of species	2	52-53	N	#
last trip	1	54	N	(blank,0,1) %
species 1	2	55-56	N	*
sp 1 catch	8	57-64	N	(baskets)
species 2	2	65-66	N	*
sp 2 catch	8	67-74	N	(baskets)
.	.	.		
.	.	.		
species 12	2	165-166	N	*
sp 12 catch	8	167-174	N	(baskets)
haul information				
haul No.	2	175-176	N	
date	6	177-182	N	(yymmdd)
initial time	4	183-186	N	(24 hr clock)
final time	4	187-190	N	(24 hr clock)
area name	6	191-196	N	
area code	2	197-198	A	
initial depth	3	199-201	N	(fathoms)
final depth	3	202-204	N	(fathoms)
species 1	2	205-206	N	*
species 1 catch	6	207-212	N	(baskets)
.	.	.		
species 8	2	261-262	N	*
species 8 catch	6	263-268	N	(baskets)

Notes: A – Alphabetic; N – Numeric; * - Refer to code lists
- No. of species recorded in species catch (1)-(12); % - '1' denotes last trip for the year
1 basket = 70lb

(b) *Data Quality*

A total of 31,266 individual haul records were available for the 1937-1943 period. A summary of the completeness of important fields is given in Table 2.

Table 2: Data Completeness, 1937-1943

Field	Records	% of total
depth fished	13,634	43.61
species catch wt	31,266	100.00
position	0	0
vessel name	31,266	100.00
date	31,266	100.00

Note: - depth applies to initial or final depth; position is both latitude and longitude
- 100% of records had an encoded fishing ground

(c) *Catch Positions*

No hauls had latitude or longitude recorded. A six character fishing ground code was given, and these were interpreted as shown in Table 3 (some found by reference to Colefax, 1934). Estimates of the geographic location of the position on the coast, and the 200 and 1000m isobaths are shown in the table for those grounds which could be identified. A small number of codes could not be interpreted. Actual catch positions were estimated by interpolation according to the depth fished (mean start and end depth). Where no depth was given, 100m was used. Figure 2 maps the resulting estimated catch positions.

Figure 2: Estimated Catch Positions, 1937-1943

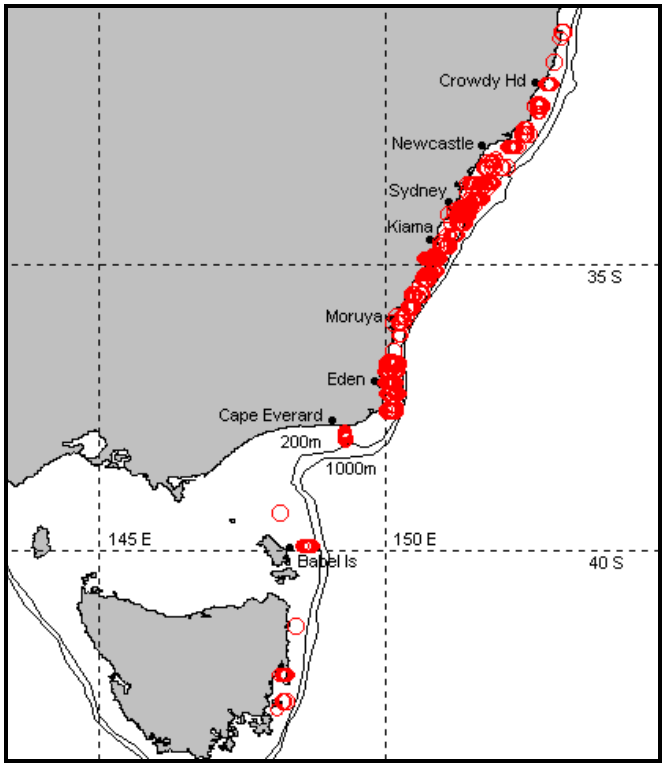

Table 3: Fishing Ground Codes and Assumed Locations

Code	Ground	Lat 0m	Long 0m	Lat 200m	Long 200m	Lat 1000m	Long
BABEL	Babel Is	3957	14820	3957	14852	3957	14858
BASSPT	Bass Point	3436	15047	3436	15111	3436	15120
BATE	Batemans Bay	3544	15015	3544	15050	3544	15056
BERMAG	Bermagui	3626	15004	3626	15015	3626	15020
BIRD	Bird Is	3314	15136	3314	15214	3314	15224
BOTANY	Botany Bay	3400	15114	3400	15133	3400	15151
BRGHTN	Broughton Is	3237	15219	3237	15240	3237	15251
BROKEN	Broken Bay	3336	15119	3336	15152	3336	15208
BRRNJY	Barrenjoey Pt	3335	15120	3335	15154	3335	15208
BRUSH	Brush Is	3532	15025	3532	15043	3532	15047
CATHRN	Catherine Hill Bay	3309	15138	3309	15217	3309	15229
CHRLTT	Charlott Hd	3220	15233	3220	15254	3220	15301
CLCLFF	Coalcliff	3415	15059	3415	15124	3415	15135
CPFRST	Cape Forster	3211	15231	3211	15254	3211	15305
CPGREN	Cape Grenfell	3454	15036	3454	15103	3454	15111
CPHOWE	Cape Howe	3730	14959	3730	15014	3730	15018
CPHWKE	Cape Hawke	3213	15234	3213	15256	3213	15305
CPSMKY	Smoky Cape	3055	15305	3055	15312	3055	15319
CRNLLA	Cronulla	3402	15111	3402	15135	3402	15152
CROWD	Crowdy Hd	3151	15245	3151	15303	3151	15319
DSASTR	Disaster Bay	3716	14958	3716	15017	3716	15021
EDEN	Eden	3704	14955	3704	15017	3704	15021
EVRARD	Cape Everard	3748	14916	3807	14922	3820	14926
GABO	Gabo Is	3734	14955	3734	15013	3734	15018
GOALEN	Goalen	3631	15003	3631	15020	3631	15025
HAYSTK	Haystack Rock	4212	14804	4212	14832	4212	14837
HCKING	Port Hacking	3404	15106	3404	15131	3404	15149
HELENS	St Helens	4120	14815	4120	14837	4120	14848
JERVIS	Jervis Bay	3507	15046	3507	15058	3507	15106
KEMBLA	Port Kembla	3429	15055	3429	15116	3429	15126
KIAMA	Kiama	3440	15051	3440	15110	3440	15120
KRGORO	Korogoro Is	3103	15302	3103	15312	3103	15319
LAKENT	Lakes Entrance	3752	14800	3820	14831	3829	14844
LILVAL	Lily Vale	3412	15100	3412	15124	3412	15137
LONGPT	Long Point	3345	15115	3345	15145	3345	15205
MARIA	Maria Is	4240	14808	4240	14824	4240	14831
MARION	Marion Bay	4248	14800	4248	14821	4248	14827
MARLEY	Marley Beach	3407	15108	3407	15127	3407	15142
MCQRIE	Port Macquarie	3127	15255	3127	15308	3127	15315
MONTA	Montague Is	3615	15014	3615	15018	3615	15023
MOON	Moon Bay	3642	14959	3642	15016	3642	15021
MORNA	Unknown	0	0	0	0	0	0
MORUY	Moruya	3555	15008	3555	15028	3555	15031
MOWRR	Mowarry Pt	3709	15000	3709	15017	3709	15021
MRMBL	Merimbula	3654	14956	3654	15016	3654	15020
NORAH	Norah Hd	3317	15135	3317	15211	3317	15219
NWCSTL	Newcastle	3256	15146	3256	15233	3256	15239
NWZLND	New Zealand Ground	3343	15126	3338	15152	3334	15208
OHARA	O'Hara Hd	3534	15023	3534	15041	3534	15045
PINES	The Pines	3601	15009	3601	15024	3601	15028
RED HD	Red Hd	3515	15033	3515	15054	3515	15100
SHLHVN	Shoalhaven Hd	3451	15045	3451	15106	3451	15113
SISTER	The Sisters	3930	14744	3912	14837	3908	14844

STPHNS	Port Stephens	3242	15210	3242	15241	3242	15250
SYDHDS	Sydney Hd	3351	15118	3351	15142	3351	15205
TATHRA	Tathra	3644	14959	3644	15016	3644	15020
TLLGTS	Tollgate Is	3545	15016	3545	15034	3545	15038
TNCRRY	Tuncurry	3211	15230	3211	15256	3211	15305
WABUN	Wybung Head	3312	15140	3312	15214	3312	15224
WARDE	Warden	3523	15030	3523	15047	3523	15053
WATMO	Wattamolla	3408	15108	3408	15128	3408	15143
WRECK	Wreck Bay	3511	15038	3511	15055	3511	15103

(d) *Species Identification*

Two letter species codes were used in the data. The meaning of the codes was not documented, and interpretation was initially provided by Kevin Rowling of NSW Fisheries. This interpretation was supplemented with the following information from Roughley (1916) on trawler catches off NSW in 1915 and 1916:

'The total weight of fish captured from the commencement of operations, 7th June, 1915, till the end of July, 1916, was 2,326,481 lb. The species captured in greatest abundance, and arranged in that order, are as follows:--

1. Tiger or Deep-sea Flathead (*Neoplatycephalus macrodon*).
2. Sharp-beaked Gurnard (*Pterygotriglia polyommata*).
3. John Dory (*Zeus faber*).
4. Yellow leatherjacket (*Pseudomonacanthus ayraudi*).
5. Short Boarfish (*Zanclistius elevatus*).
6. Nannygai (*Trachichthodes affinis*).
7. Jackass Fish (*Dactylosparus macropterus*)
8. Morwong (*Dactylosparus carponemus*)
9. Barracouta (*Thyrsites atun*)
10. Thetis fish (*Neosebastes thetidis*)
11. Snapper (*Pagrosomus auratus*)
12. Red Gurnard Perch (*Helicolenus percoides*).'

Modern equivalents:
1 = tiger flathead (*Neoplatycephalus richardsoni*)
2 = latchet (*Pterygotriglia polyommata*)
4 = chinaman leatherjacket (*Nelusetta ayraudi*)
5 = long-finned boarfish (*Zanclistius elevatus*)
6 = redfish (*Centroberyx affinis*)
7 = jackass morwong (*Nemadactylus macropterus*)
8 = blue morwong (*Nemadactylus douglasi*)
11 = snapper (*Chrysophrys auratus*)
12 = ocean perch (*Helicolenus percoides*)

May and Maxwell (1986), others as historically listed

Table 4: Species Codes in the 1937-1943 Data, and Assumed Identification

Code	Name	CSIRO code	wt (kg)	records
FL	tiger flathead	296001	6,033,406	30,318
MI	mixed	999999	2,033,521	13,229
MO	jackass morwong	377003	928,455	5,442
LJ	chinaman leatherjacket	465006	499,216	3,701
NA	redfish	258003	431,481	1,600
GU	latchet	288006	199,339	2,492
SH	shark	18000	114,240	1,049
JD	john dory	264004	107,522	1,671
SA	unknown	1	51,127	941
SN	snapper	353001	14,767	35
LA	latchet	288006	13,705	334
DO	dory	264000	4,978	88
KG	kingfish	337006	1,461	4
SK	rays	31000	1,296	34
PE	ocean perch	287001	222	1
RA	rays	31000	64	2

(e) *Total Catch by Year and Vessel*

Table 5: Total Retained Catch and Number of Hauls by Year

Year	Total Catch (kg)	Hauls
1937	1,950,643	6,476
1938	3,055,925	9,222
1939	3,066,765	9,337
1940	730,804	2,192
1941	878,350	2,416
1942	617,398	1,396
1943	128,428	227

Total catch and number of hauls by vessel for the 1937-1943 data are presented in Table 6. Discarded catch was not recorded.

Table 6: Catch and Number of Hauls by Vessel

Vessel	Retained wt	Discard wt	Operations
Alfie Cam	888,574	0	2,928
Bareamul	1,892,268	0	4,804
Beryl 2	828,382	0	2,577
Dureenbee	1,498,070	0	4,738
Goolgwai	521,114	0	1,589
Goonambee	1,026,538	0	3,189
Goorangai	847,519	0	2,709
Korowa	530,306	0	1,515
Mary Cam	1,457,932	0	4,300
Olive Cam	816,626	0	2,547
Samuel Benbow	120,984	0	370

(f) *Catch by Depth*

Total catches by depth interval (0=0-20) are given in Table 7. Depths have been converted from fathoms to metres. All recorded depths were within the ranges shown and no adjustments for mis-recording were made.

Table 7: Total Retained Catch Weight by Depth Interval

Depth (m)	Retained wt (kg)	Discard wt (kg)	Hauls
0	826	0	3
20	1,937	0	6
40	57,084	0	213
60	187,007	0	756
80	714,170	0	2,465
100	905,706	0	2,883
120	1,468,218	0	4,106
140	970,727	0	2,572
160	85,727	0	251
180	50,733	0	181
200	40,584	0	182
220	2,572	0	10
240	159	0	1

(g) *Catch by Year and Species*

Table 8: Total Retained Catch by Species by Year

Code	Species	1937	1938	1939	1940	1941	1942	1943
DO	dory	0	1,435	0	480	1,311	1,752	0
FL	tiger flathead	1,132,089	1,942,816	1,952,715	410,179	348,055	186,122	61,430
GU	latchet	32	76,900	48,766	19,437	29,670	20,481	4,053
JD	john dory	9,817	27,347	21,943	14,946	21,538	8,644	3,287
KG	kingfish	0	0	0	0	223	1,238	0
LA	latchet	0	2,855	7,046	2,412	112	416	864
LJ	chinaman leatherjacket	2,574	54,762	160,777	67,494	96,066	92,371	25,172
MI	mixed	553,751	582,461	520,140	144,368	159,410	72,529	862
MO	jackass morwong	209,782	322,307	249,183	35,861	82,573	28,398	351
NA	redfish	43,514	40,287	75,653	21,753	118,086	129,925	2,263
PE	ocean perch	0	0	0	0	0	222	0
RA	rays	0	64	0	0	0	0	0
SA	unknown SA	0	5,828	16,989	13,742	11,673	2,895	0
SH	shark	0	320	0	574	10,150	72,937	30,259
SK	rays	0	256	656	96	288	0	0
SN	snapper	0	0	14,767	0	0	0	0

2. Final Conversion Format

All data were converted into the following format. This is suitable for loading into the AFZIS system without the need for further data manipulation. The files were in dBase III databases, and have been converted into the HMAP schema.

Field	Field Name	Type	Width	Dec
1	BOAT_NAME	Character	15	
2	DATE	Numeric	6	
3	HAUL_NO	Numeric	2	
4	OP_NO	Numeric	2	
5	ST_TIME	Numeric	4	
6	EN_TIME	Numeric	4	
7	ST_DEP	Numeric	4	
8	EN_DEP	Numeric	4	
9	LAT	Numeric	6	2
10	LONG	Numeric	6	2
11	EFFORT	Numeric	6	2
12	RET_WT	Numeric	8	
13	DIS_WT	Numeric	8	
14	TOT_WT	Numeric	8	
	** Total **		84	

Field	Field Name	Type	Width	Dec
1	BOAT_NAME	Character	15	
2	DATE	Numeric	6	
3	HAUL_NO	Numeric	2	
4	OP_NO	Numeric	2	
5	SPECIES	Character	2	
6	SP_CODE	Numeric	6	
7	WT	Numeric	8	
	** Total **		41	

3. References

Colefax, A.N. 1934. A preliminary investigation of the natural history of the tiger flathead (*Neoplatycephalus macrodon*) on the south-eastern Australian coast. I. *Proc. Linn. Soc. NSW*. 59, 71-79.

May, J.L. and Maxwell, J.G.H. 1986. *Field guide to Trawl Fish from Temperate Waters of Australia*. CSIRO Division of Fisheries Research. 492pp.

Roughly, T.C. 1916. *Fishes of Australia and Their Technology*. William Applegate Gullick, Government Printer, Sydney. 296pp.

4. Outputs

The data have been used to inform a number of analyses, including:

N.L. Klaer, 'Steam trawl catches from south-eastern Australia from 1918 to 1957: trends in catch rates and species composition' *Marine and Freshwater Research*, 52(4), 399-410.

Abstract: Haul-by-haul steam trawler catch and effort data for 1918–23, 1937–43 and 1952–57, which cover a large portion of the history of steam trawling in the Australian South East Fishery, were examined in detail for the first time. There were 64371 haul records in total. The catch-rate for all retained catch combined shows a strong decline overall, with a brief recovery during World War II, probably due to increased retention of previously discarded species. The fishing fleet moved to more distant fishing grounds and deeper waters as the catch-rate declined. The catch-rates of the main commercial species followed a similar pattern in a number of regions within the fishery. The catch-rate of the primary target species – tiger flathead (*Neoplatycephalus richardsoni*) – dropped considerably from the early, very high, catch-rates. Chinaman leatherjacket (*Nelusetta ayraudi*) and latchet (*Pterygotrigla polyommata*) – species that were apparently abundant in the early years of the fishery, virtually disappeared from catches in later years. The appearance of greater catches of jackass morwong (*Nemadactylus macropterus*), redfish (*Centroberyx affinis*) and shark/skate during the war and afterwards was probably due to increased retention of catches of these species. The disappearance of certain species from the catch may be due to high fishing pressure alone, or to a combination of fishing pressure, changes in the shelf habitat possibly caused by the trawl gear, and environmental fluctuations.

Keywords: fisheries management, south east trawl fishery, CPUE, historical, steam trawler, stock assessment.