THE RIVER OR SEA MULLET OF WESTERN AUSTRALIA

By A. J. Fraser*

INTRODUCTION

The fishery on the river or sea mullet of Western Australia, unlike that of New South Wales and Queensland, is by no means the major inshore fishery, but from the point of view of the estuarine fishermen of Perth, Bunbury and Mandurah, it provides what they regard as their chief "bread-and-butter" line. Although the annual mullet catch in the last ten years has never exceeded 11% of the total catch of wet fish (as against roughly 40% in the two States mentioned), the fishery is nevertheless of such importance economically as to warrant the attention paid to it in the past by the Department and the Division of Fisheries, C.S.I.R.O.

In the preparation of this necessarily brief paper I have been assisted by Dr. D. L. Serventy, now of the Wildlife Survey Section, but formerly of the Division of Fisheries, C.S.I.R.O., and Mr. J. M. Thomson, of that Division, who have written portions of the text. I am greatly indebted to both. Mr. Ivan R. Berry, Chief Draftsman of the Mines Department, W.A., was responsible for drawing the map.

THE FISH

The family Mugilidae, or "Grey Mullets", to which the River or Sea Mullet (Mugil dobula) of Western Australia belongs, has numerous species inhabiting the coastal waters of the temperate and tropical zones. They chiefly frequent brackish waters, where there is abundant food consisting principally of organic matter mixed with sand or mud. The grey mullets have, as a modification of the pharyngeal organs, an apparatus by

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which the food is filtered from the sand and mud, which are finally ejected. About thirty species are found in Australian waters. Many people regard them as perhaps the choicest table fish in local waters. They certainly stand high in popular esteem.

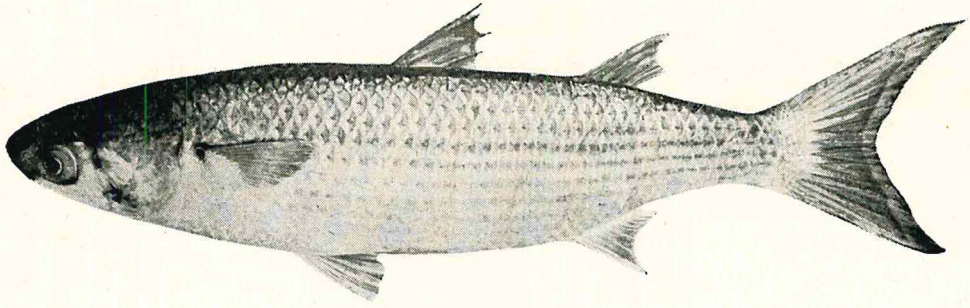
According to Kesteven, Mugil dobula in Western Australia, where Günther secured his type specimens, does not differ in any significant way from the eastern Australian species, but recent raciation studies suggest that there are at least certain racial, even if not specific, differences. This is admitted by Kesteven, who is prepared to concede that the eastern stocks may comprise two or more races. J. M. Thomson, in a private communication, suggests that the Australian species is Mugil cephalus. He says that examination of specimens of M. cephalus from the Mediterranean, South Africa and Japan shows there is no recognisable difference between them and M. dobula.

In Western Australia mullet is certainly not as abundant as in the rivers of New South Wales and Queensland. No doubt this is due largely to the smallness of our river systems compared with such systems as the Richmond, Clarence, Hawkesbury and Shoalhaven, and our complete lack of large coastal lakes like those of Tuggerah, Macquarie and Illawarra.

The estuaries, shallow bays, and sea beaches are the home of the mullet. They depend for their food upon these shallow waters owing to their specialised requirements. During migrations they may move well out to sea, but they cannot survive there - at least in large numbers. Mullet cannot feed on active animals. Only the estuaries and shallow seas supply in quantity food of the kind they require. Algae do not grow in deep waters, and detrital material, i.e., small pieces of plant and animal bodies broken up in the process of decay, is common only near land.

As the estuaries and shallow bays, such as Shark Bay, are limited in number and extent, it follows that there is a definite limit to the quantity of mullet that can be fed on these grounds. Other kinds of fish and many sea-creatures compete for the same food.

But besides the limitations of food, limitations



RIVER OR SEA MULLET
(Mugil dobula)

of space restrict the stocks. The typical life of mullet is as follows:- the young fry enter the bays and estuaries from the sea from August to November and gradually spread over the shallows and up into the rivers. Within a month or so some have even penetrated to fresh water; but most of them stay in the lower reaches. In the second year, their distribution is much the same. Tagging indicates that although some fish move from the estuaries upstream others move down, so that a more or less even balance in numbers is maintained between the estuary and the river. Floods drive many river mullet downstream, but otherwise there is always some population of first and second year fish upstream. In the third year most of the large fish live in the fresh water until late summer. Then as autumn approaches they appear temporarily in the estuaries as they head for the sea on their spawning migration.

In Western Australia only the lower sea-invaded estuaries are permanent in extent. Most of the rivers cease to flow each summer, and the fresh water zone becomes a string of isolated pools. In pools which remain deep enough to escape attention from predatory birds mullet can live; but compared with the fresh waters of eastern Australia only very few can be accommodated here. What happens to the surplus fish which normally would enter the fresh waters? The second year fish remain in the estuaries, but the third year fish do not - otherwise they would be caught there. They do not die off - otherwise the death of so many fish would not go undetected. There remains only escape to the sea. It is believed that the large schools of mullet in Shark Bay and Exmouth Gulf are made up from migrants from the rivers of the South-West, though this has yet to be proved. While large numbers of mullet have been tagged in the South-West, none have yet been returned from Shark Bay. However three fish tagged in Leschenault Inlet (Bunbury) have been recaptured on the beach at Geraldton.

Mullet spawn for the first time at a length of approximately 12 inches. At the end of the first, second and third years they have grown to 4 inches, 8 inches and 12 inches respectively. By now they have left the estuaries. After spawning, the growth rate slows down and the fish reach 14 inches in the fourth year and 16 inches in the fifth. On their spawning run

mullet swim north against the prevailing southerly oceanic current, and somewhere at sea spawning takes place. For some weeks the eggs and young fish drift southwards with the current and eventually when an inch or more in length the fry enter the rivers, attracted perhaps by the current or by the lowered salinity or by traces of good food.

The young are even attracted by seepage through sand-bars. When streams such as the Greenough River near Geraldton or the Salt River east of Albany open (usually only for a very short time) small mullet can be seen crowding in through the gutters formed in the bars. The bars which are mostly in remote localities frequently open and close unobserved, and this has led to the belief that mullet have spawned in the barred estuaries. This belief cannot be supported by any available evidence.

What is the complete picture then? Commercially the sea mullet provides a relatively low level fishery, limited by the extent of suitable feeding grounds, and by limitations of space. The stocking of the estuaries may be a matter of some chance depending upon the arrival of schools of young mullet outside their mouths while some discharge is occurring to attract the young fish inside; or upon the opening of the bar when the small fry are outside.

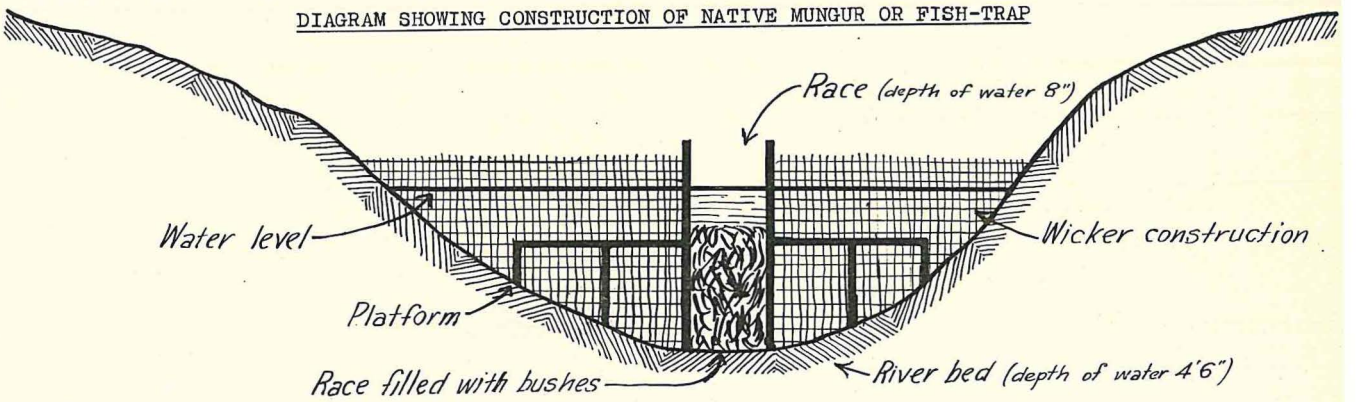
THE FISHERY

(a) Yesterday

There is no doubt that mullet formed a very important part of the diet of the south-western natives in pre-settlement days. Their "mungur" or fish-trap in the Serpentine River and elsewhere was in regular use up to the 'seventies, although it functioned more or less spasmodically until the end of the century. As a matter of fact, it is only during the past year or two that all traces have been removed in the course of river improvement works upstream of Barragup.

An excellent description of the mungur is given by J. E. Hammond in "Winjan's" People! I take the liberty of quoting it verbatim, as well as of reproducing the diagram which accompanies it. The diagram is opposite.

DIAGRAM SHOWING CONSTRUCTION OF NATIVE MUNGUR OR FISH-TRAP



(After Hammond)

664-53/6/53-200-0

Hammond writes - "The natives' chief method "of catching fish was by a mungur, or fish trap, "which was constructed by them every year for the "purpose. The last time I saw this method used was "in the 'seventies.

"To make this trap they chose the narrow "neck of the river, at Barragup on the Serpentine, "where the water was up to about four feet in "depth. They constructed the trap every year in the "same place and I never knew of their building "one elsewhere in the South-West. A wicker fence was "built across the stream, completely closing it from "bank to bank, except in the centre, where a small "opening was left. Through this opening a race was "constructed by driving two parallel rows of stakes "in the river bed. The bottom of this race was "filled with bushes, until there was only about "eight inches of clear water above the bushes for "the fish to swim through. On either side of this "race was built a platform, about two feet six "inches below the top of the water. On these "platforms the natives stood to catch the fish "as they swam through the race. The fish were "caught by hand as they passed over the bushes and "were thrown to natives who were waiting on the bank "to receive them.

"At Barragup, the natives always met at the "commencement of winter to catch the fish that were "forced down the stream by the fresh water. Some "half a dozen men and women would stand on either "side of the outlet in the centre and the fish "would be thrown out in thousands. Hundreds of "natives from the eastern and northern districts, "as well as from the South-West, would gather there "to live on them. What they could not eat they "threw back into the river after the fish had been "dead two or three days. They were very superstitious "about letting any fish escape, for they thought that "if one got away it would tell all the others and "they would not go into the river again.

"The settlers used to go to buy fish from "the natives at Barragup; and I have seen them "get a cartload of fish for a few pounds of flour "and tea and sugar and a couple of three-penny "sticks of tobacco. The fish was often used to

"manure the fields.

"The natives also caught fish by wading in "the shallow water and stabbing them with the 'gidgee', "a long and heavy spear."

One or two other references to the mungur might well be mentioned.

Lindsay Thompson, in his "Report on the Marine Fisheries ..... of Western Australia", 1898, says, "I ought not to omit a reference to that very destructive engine for fish capture constructed by the aboriginals: I mean the mungah which is erected across the Serpentine River near the bridge.....".

Charles Tuckey, who operated a fish cannery at Mandurah, said in evidence before the Joint Select Committee in 1906 - "About 10 years ago at the native weir at Barragup I filled 10,000 tins of fish in six weeks (Barragup is on the Serpentine in the area closed after 1898)."

The Barragup mungur was destroyed about 1897 by some of the white fishermen, but the natives and some of the whites protested. In "The West Australian" of October 19 of that year is a report of a visit to the spot by the Governor (Sir Gerard Smith), to whom the local natives appealed for the restoration of the mungur. The report states, inter alia - "In the old days they (the natives) ate as many (fish) as they could and traded cartloads of them to the settlers, in barter for tobacco, to be salted down, but Billy Dowers' modern method is to sell the fish to the preserving factory at the trade rate of the fishermen, hence his statement that the sacking of the weir had prevented him and his compatriots making a living".

In addition to that operated by the Charles Tuckey mentioned above, other canneries were established in the Mandurah district for the canning of mullet. Robert Smart had developed a profitable little business, but he claimed that the closure of the Serpentine and other rivers in 1898 to commercial fishing had ruined his enterprise and he sought financial assistance to remove his plant to Shark Bay. Another cannery was conducted by the Dawe family on the shores of the Harvey estuary in the early 1900's. All three went out of business many years ago.

(b) Today

Strictly speaking there is not a mullet fishery in Western Australia today; but in our estuarine fisheries the mullet does play an important part. Nevertheless, we are accustomed to speak somewhat loosely of the snapper fishery, or the salmon fishery, or the mullet fishery, to include the area or areas in which snapper, salmon or mullet are found and fished, as well as the operations by which they are taken. It is in that sense that we use the term now.

In the eastern States there is a two-phase fishery, on the coastal beaches and in bays during the "travelling" season (i.e., the period during which the spawning migration occurs) and in the estuaries and rivers in the non-travelling period. To a lesser extent the pattern is the same in Western Australia, although the coastal fishery is of secondary importance only. The great bulk of the catch (see Production Table, page 190) is made in the three main estuaries - Swan River, Peel Inlet and Leschenault Inlet - and in Shark Bay.

In the estuaries the main methods of net-fishing in vogue are "hauling"and "setting". In the former method a net is shot in a circle around a school of fish, one end of the net having first been made fast to a rowlock or thwart of the boat. The free end is then slowly brought inboard, and the fish removed from the net as it comes over the gunwales. Bringing the net aboard without removing the fish as it comes in - commonly known to fishermen as "holus-bolusing" - is prohibited by the regulations, insofar as it does not facilitate the return of undersize fish alive to the water. "Setting" is usually performed at night by placing the net loosely in the water, the cork-line keeping the top of the net on the surface and the leadline keeping the bottom down. The net is set in a place which fish are known to frequent, and they become "meshed" or "gilled" when they come in contact with the net. Most frequently a net is lifted at intervals during the night and the catch removed - sometimes it is set all night and not lifted until the following morning.

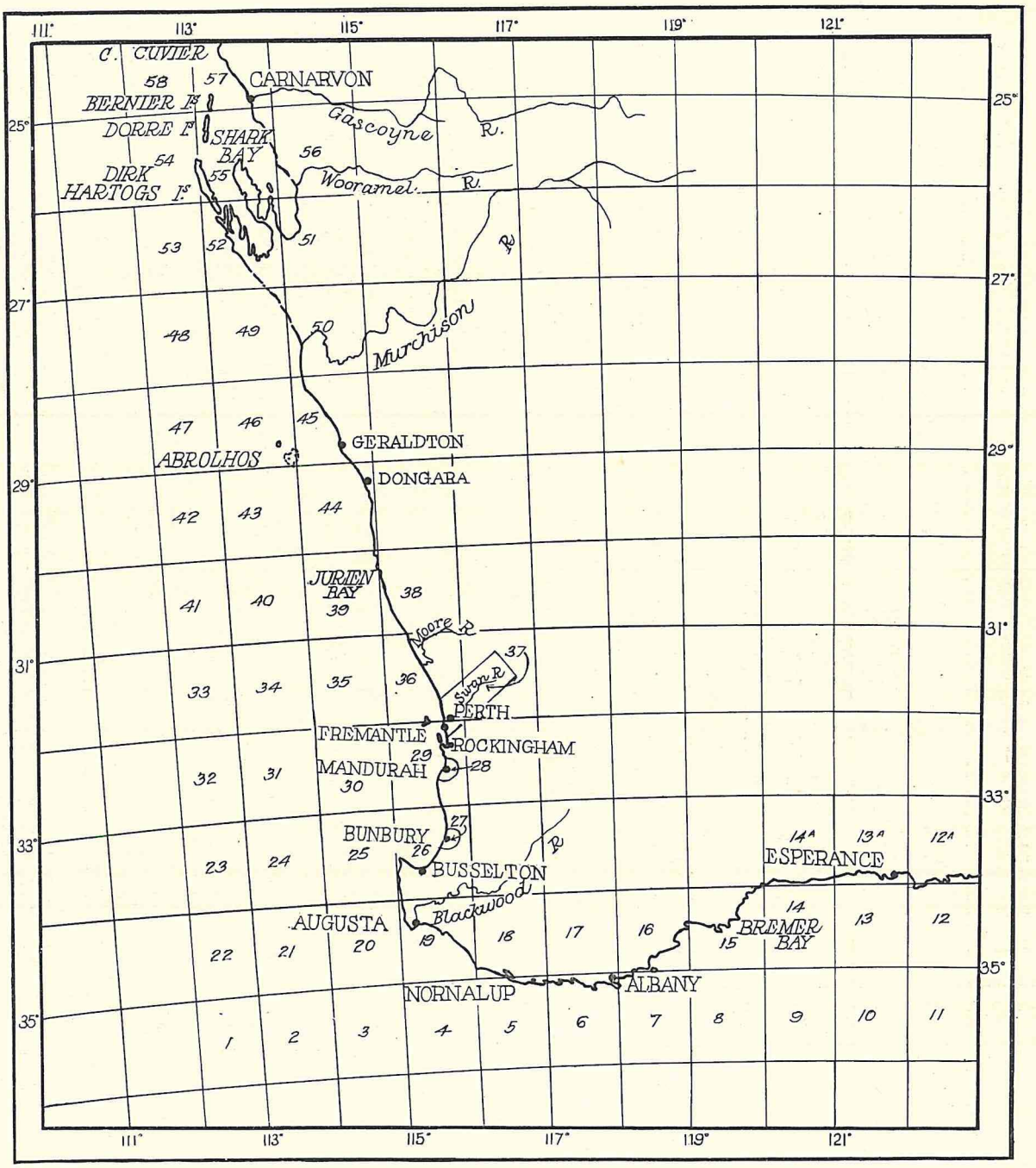
At Shark Bay setting is the means generally employed, although fish are occasionally caught by

MULLET (Mugil dobula) PRODUCTION, WESTERN AUSTRALIA, 1943-1952

Block No. +	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
5	440	30	1,137	162	126	554	1,255	1,717	1,849	554
6	5,485	5,090	8,415	5,759	14,975	6,891	12,645	11,308	13,421	12,274
7		380								2
12					120	1,740	740			
13	1,216	88	100		4,359	1,685				
14		88	953	8,200		8,163		667		160
15		6,841	12,225	27,833	43,529	42,368	23,858		4,190	2,793
16	600	910	151	149	1,042	510		1,039	3,272	326
17	1,878	7,290	8,021	3,078	12,892	6,048	6,698	11,526	15,568	10,580
18	276	50	41	67	1,044	1,090	128			
19	8,031	9,520	10,403	11,190	14,798	10,637	10,348	10,799	8,308	9,956
25							20			214
26	2,157	392	1,476	2,678	1,486	5,380	1,982	8,777	3,189	8,203
27	6,980	9,165	18,355	10,303	52,389	48,443	77,110	67,599	32,923	36,615
28	23,310	27,139	92,949	38,274	44,753	57,389	96,791	114,017	146,908	141,387
29	6,294	5,113	8,171	4,050	9,004	9,523	9,369	6,703	5,470	9,388
30										60
36	18,940	10,235	13,522	1,593	8,462	4,654	5,078	7,444	10,467	9,939
37	21,938	11,695	23,064	22,399	41,931	53,538	40,728	53,366	85,249	45,767
38			145	290	1,328	474			500	
39		197		56	300					
44	906	160	740	150	200	940	420	250	150	677
45	208	1,314	2,477	4,071	64	1,721	712	972	4,301	15,700
46	170	1,254	1,898	1,732	204					2,629
49							361			
50	2,220	1,020	1,034	6,256	17,309	6,191	3,582	4,393	7,349	3,255
51			4,766	48,093	3,577	3,257				
52	855	2,137	2,443	72,919	117,171	45,568	22,699	56,050	48,201	59,083
53	154		216						2,239	
54	1,103	1,965	1,290					1,232	2,508	
55	87,087	86,176	78,996	190,418	296,996	221,182	95,065	112,528	122,364	146,348
56		520	2,991	82,184	46,372	11,588	5,120	1,400	9,840	2,003
57			17,496	25,845	9,102					6,701
N,W. *			4,202	7,307	29,433	402	6,500	771	32,595	5,376
Totals	190,248	188,769	317,677	575,056	772,966	549,936	421,209	472,558	560,861	529,990

+ These block numbers refer to the numbered squares on the map opposite.

* Signifies areas north of block 57.


111°
113°
115°
117°
119°
121°
25°
27°
29°
31°
33°
35°
C. CUVIER
CARNARVON
BERNIER I.
DORRE I.
SHARK BAY
DIRK HARTOGS I.
Gascoyne R.
Wooramel R.
Murchison R.
GERALDTON
ABROLHOS
DONGARA
JURIEN BAY
Moore R.
Swan R.
PERTH
FREMANTLE
ROCKINGHAM
MANDURAH
BUNBURY
BUSSELTON
Blackwood R.
AUGUSTA
NORNALUP
ALBANY
ESPERANCE
BREMER BAY

seining on the banks. This method is also adopted on sea beaches, while the waters beyond the surf zone are usually fished with set nets.

Mr. J. E. Munro, Metropolitan Inspector, has set down some of his observations in regard to the mullet which should be placed on record. He says -

"It is a well-known fact that after a "succession of easterly winds, particularly during "January and February, mullet leave the Swan and "Canning Rivers for the sea. These fish range from "8 to 12 inches, and are netted at Scarborough and "adjacent beaches each year. At the same time "mullet are fished at Hamelin Bay (just north of "Cape Leeuwin), North Beach (Bunbury) and South "Beach (Fremantle).

"On all these beaches large schools appear "in midsummer, generally moving northwards. The "significant fact about these migrations is that "the mullet at Hamelin and Bunbury are mostly of a "large run - from 14 to 18 inches - which coincides "with the run of fish inhabiting the inlets and rivers "of the south coast. On the other hand, all fish "taken on the metropolitan beaches are of a similar "size to those which move out of the Swan. Some- "times in a good season large quantities of mullet "are caught on the beaches between Scarborough and "Trigg's Island, by the use of short nets (70-90 "yards) of 2¼" mesh - these are used by the method "of 'meshing'. Very often no boat is used, but "the fisherman wades out into the surf ahead of the "school with the net on his shoulder, and pays out "the net as he wades in a half-circle. Primitive "as this method appears, it is the most effective. "Beach seines are not as effective on our beaches "as the meshing nets described."

The west coast estuaries are probably fished almost to capacity for mullet. Shark Bay could possibly support double the present number of fishermen. To the north of Shark Bay, the river or sea mullet is gradually supplanted by tropical mullets of similar appearance. East of Albany the catch of mullet has declined to negligible proportions since salmon fishing began a few years ago.

CONSERVATIONAL MEASURES

The upper waters of the Swan and Canning Rivers had been closed to commercial fishing since 1889, but the first closure affecting the rivers and lakes in the Mandurah area (Murray and Serpentine Rivers) and the rivers flowing into Leschenault Inlet (Collie and Preston Rivers) was not gazetted until 1898. This was done on the recommendation of Chief Inspector Lindsay Thompson, who believed these waters were the spawning grounds of mullet and other fish.

The fishermen strongly opposed these measures and it is evident from departmental files and the Press of the time that the closures interfered with a settled custom. A petition dated June 20, 1899, addressed to the Minister for Lands by some of the fishermen and fish "preservers", drew attention to the great hardship which had been caused by the restrictions at Mandurah, and urging that the closure be confined to two months in March and April, the supposed spawning time. The petitioners asked that in the proposed ten months open season "the rivers be thrown open to net fishing with nets of not less than $3\frac{1}{2}$ inch mesh, which will not capture fish of a smaller size than $1\frac{1}{2}$ lb.

Departmental records show that the mesh consistently used for the capture of mullet in the three west coast estuaries was $2\frac{1}{4}$ inches. In 1911 this mesh was proclaimed for Bunbury, and prevailed until 1931, when an increase to $2\frac{1}{2}$ inches was effected. Subsequently, after it became apparent that $2\frac{1}{2}$ inch mesh did not enable fishermen to earn a livelihood, the mesh was reduced to $2\frac{1}{4}$ inches, which is the prescribed minimum today (except for "setting" for mullet, when the minimum is $2\frac{1}{2}$ inches).

In the Mandurah district the first minimum mesh was prescribed in 1914, when a "mullet net" was proclaimed with a mesh not less than $2\frac{1}{4}$ inches. This still remains operative, except for mullet set-nets, in respect of which $2\frac{1}{2}$ inches is the minimum permitted.

The Swan River has seen many changes in the size of mesh prescribed. In 1898 the minimum was fixed at 3 inches; this was reduced to $2\frac{3}{4}$ inches in 1901. The mesh was in 1907 further reduced to $2\frac{1}{2}$ inches,

and in 1921 to 2¼ inches. This is the present minimum, except that here as well 2½ inches is the smallest allowed for set nets for mullet.

Prior to 1900 the minimum legal weight of mullet was 4 oz., representing an overall length of approximately 8¼ inches. Subsequently this was increased to 6 oz. (approximately 9½ inches), and a little later it was reduced to 5 oz. with a length of about 9 inches. Minimum weights were replaced by minimum lengths in 1913, when the standard of 9½ inches was adopted for mullet.

When in 1940 and 1941 he was working on the mullet fishery of eastern Australia, Mr. G. L. Kesteven, of the C.S.I.R. Division of Fisheries, was provided with a series of length measurements of mullet made at the Perth market. He subsequently reported that "the measurements mean that the proportion of spawning stock in this fish population is devastatingly low: in fact, it rather looks as though M. dobula could easily become exterminated from Western Australian waters". He urged that the Fisheries Department take steps aimed at conservation.

Somewhat alarmed by an authoritative expert warning, backed up by C.S.I.R., that the mullet fishery faced extinction, the Department took prompt action and increased the minimum legal length of the fish in March, 1942, to 10 inches, and in March, 1943, by a further 1 inch to 11 inches. Despite the urgent need for fish as food (World War II was then at its height), the Department considered that the preservation of the mullet fishery justified such extreme action, and rejected all overtures from the fishermen - and they were legion! - for reconsideration. The drop in mullet production as a result of the size increases was very sudden, though not totally unexpected, and it is estimated that some half-million pounds of fish were lost to the end of 1944, although the actual figure could in fact be much greater.

The fishermen, as has been stated, did not adopt the scheme without protest. They refused to accept Kesteven's depletion hypothesis, and petitions through members of Parliament and public bodies were almost unceasing. All concerned maintained that the

size of the mullet inhabiting the estuaries had always been small, from $8\frac{1}{2}$ to $10\frac{1}{2}$ inches, and that as they matured they either moved into the rivers or out to sea.

Towards the end of 1944 - no further increase, although originally intended, had been made during that year in the minimum legal length - Mr. E. J. Brownfield, the acting Chief Inspector, and Dr. D. L. Serventy, of C.S.I.R. Division of Fisheries, in view of the diverse opinions expressed by C.S.I.R. on the one hand and the fishermen on the other, decided to re-examine the evidence on which Kesteven had based his earlier findings. In a lengthy report they thoroughly reviewed the case, suggesting that Kesteven had gone astray in his interpretation of the measurement data, and that there was no proof whatever of depletion in the west coast estuaries.

Among the conclusions arrived at by Brownfield and Serventy were the following -

(a) The various size groups of mullet had different habitat preferences, the main controlling factor appearing to be salinity; thus the series of inlets, estuaries and rivers in the south-west of Western Australia carried differing size-groups of mullet and were well-known to the fishermen as "big mullet" or "small mullet" waters, as the case may be;

(b) It so happened that the great bulk of the Perth supply came from the "small mullet" waters of the Swan River and the Mandurah and Bunbury estuaries. Hence measurement data from such material comprised a biased sample, so far as assessing the condition of the mullet population as a whole was concerned, and was incapable of being used to support a depletionary hypothesis. The bigger mullet, whose absence caused such concern, did occur, but in other habitats, many of them legally closed waters;

(c) Whatever statistics of production existed lent no support to the belief that the estuarine catch had fallen off, either absolutely or <u>per capita</u>, since the end of the last century.

at Shark Bay, suggesting that the estuarine and river phases of life are not obligatory, but simply to be preferred as sources of food.

So long as the large mullet at Shark Bay are not overfished, and provided the smaller estuaries are allowed to remain closed to netting so as to provide sanctuary for the smaller fish, there is little to fear from depletion. The catch of mullet in the Swan River has shown a drastic decline since 1910, but this is almost certainly due to the destruction of their feeding g rounds as a result of river improvement schemes and dredging for shell for the local cement works.

If it should ever come about that the average length of mullet taken at Shark Bay drops from 16 inches as at present to, say, 12 inches, then the introduction of strong control measures will indeed be justified. Kesteven (1942) and Thomson (1953) place some stress on the fecundity of mullet, and it would appear that just so long as the present stock of brood females, each producing 25,000,000 eggs every year, remains in the area, there need be no misgivings about the future. At the same time year-to-year fluctuations may be expected in the estuarine catch, and a reduction in the take for a year or two is more likely to be due to accidents of the environment, such as floods, or dry seasons, or food shortages, or failure of the young fish to enter the estuaries, rather than an indication of depletion. Fish are not what they used to be, say the old hands! They never were!

MATERIAL FOR FURTHER STUDY

Kesteven, G.L., 1941 Conserving the Mullet Catch. W.Austn. Fish. Dept. Bull. 1

\- , 1942 Studies in the Biology of Australian Mullet (1). Coun.Sci.Ind.Res.(Aust.) Bull. 157.

Thomson, J.M., 1950 The Effect of a Period of Increased Minimum Length of Sea Mullet in Western Australia. Aust.J.Mar. Freshw.Res., 1., pp. 199-220.

\- , 1951 Growth and Habits of the Sea Mullet (Mugil dobula Günther) in Western Australia. Aust.J.Mar.Freshw.Res. 2., pp. 193-225.

\- , 1953 Status of the Fishery for Sea Mullet (Mugil cephalus Linnaeus) in Eastern Australia. Aust.J.Mar. Freshw.Res., 4, pp. 41-81.

The report concluded with a recommendation that the minimum length be restored to what it was prior to the inception of the conservation scheme, pointing out that the new statistical system inaugurated by the Department would detect any depletionary tendency which might occur in the future.

The evidence as a whole was considered by the Minister for Fisheries (Hon. A. A. M. Coverley, M.L.A.) and referred to the Chief of the Division of Fisheries, C.S.I.R. (Dr. H. Thompson) for his opinion. After consideration by and discussion at a staff conference of the Division of Fisheries, Dr. Thompson returned a finding "that it is possible, but that it is not proven, that the mullet fishery was in a badly depleted state in 1941". He said that it had not been shown that a high number of spawning fish was essential, but that it was desirable that the fishery be based on larger individuals.

In view of the verdict of "not proven", the conservation scheme was abandoned in October, 1946, and the minimum legal length of 9½ inches re-established. It remains the same today.

RETROSPECT - AND PROSPECT

Looking back, and knowing what we know of the distribution pattern of mullet in this State (see pp 184-5), we can appreciate why the experiment of raising the legal minimum did not produce the anticipated results. The small mullet survived to a larger size as predicted, but by the time they could be taken legally, they were no longer in the estuaries. Presumably they helped to swell the schools of large mullet at the Abrolhos Islands, Shark Bay and Exmouth Gulf, unless there happens to be some hitherto undiscovered mullet haven somewhere at sea.

There remained the possibility that larger breeding stocks at sea might produce more young and so increase the number of smaller mullet in the estuaries. However, when the legal minimum length was again reduced the catches did not remain for long at a higher level than in earlier years. Possibly the estuaries cannot support more mullet than they do now; or maybe some only of the young produced at sea ever reach the estuaries. Certainly young mullet can always be found